

Zero WASTE

“Governing efficiently and effectively means giving citizens sustainable options.”

Christine Cooley,
MUSC Sustainability Manager
Subcommittee Chair

This plan was developed during a time of great opportunity for the City to directly influence positive changes to waste management. During 2008 and 2009, issues coalesced to motivate and influence the waste management practices of the City, its citizens, and its businesses.

Beginning July 2008, the Bees Ferry Landfill no longer accepted construction and demolition waste from private haulers. In 2009, Charleston County Council committed to end its waste incineration program by January 2010. Also in 2009, Charleston County set a goal of a 40% recycling rate¹ -- four times the current rate. The County has also created a "Green Ribbon Committee" to evaluate existing waste management practices and gather public input.

Working in the context of these changes, the City of Charleston can capitalize on new opportunities to support progress on the County level and further the goals of climate protection and sustainability.

Where We Begin

Currently, Charleston participates in the County's successful but limited recycling and waste reduction program. For years, the County has been

burning 70% of its garbage in the incinerator, and putting 20% in the Bees Ferry Landfill.² Therefore, only 10% of waste is diverted from the incinerator and the landfill through recycling or composting.

As Charleston seeks to increase this "diversion rate," other cities and states can provide inspiring models. Six major cities nationwide, including Los Angeles, have diversion rates of 60% or better.³ California diverts 58% of its waste, and Maryland diverts nearly 50%.⁴ Major corporations are leaders in diversion as well. Safeway stores divert 85% of their waste, and Hewlett-Packard diverts more than 90%.⁵

The following recommendations roughly follow the EPA's solid waste hierarchy of reduce, reuse, recycle, and provide specific suggestions about how to proceed, focusing on the City and its potential to influence County decisions:

Zero Waste

The City should pass a resolution to have Zero Waste as its goal. Much as an employer sets "zero accidents" as a workplace goal, the resolution would frame the issue so that garbage is no longer accepted as inevitable.

In 2008, Zero Waste topped Newsweek's list of "10 Fixes for the Planet."⁶ Atlanta recently

ZERO WASTE

ACTIONS

1. Commit to a goal of Zero Waste.
2. Expand recycling and composting.
3. Explore energy recovery technologies.
4. Educate the public.

BENEFITS

-  Reduce energy costs
-  Conserve natural resources
-  Protect clean air
-  Protect clean water
-  Improve public health
-  Create jobs
-  Enhance quality of life
-  Slow climate change
-  Raise awareness

established a Zero Waste Zone downtown,⁷ and communities across the country, including Austin, Texas and Carrboro, North Carolina, are passing Zero Waste plans and resolutions.⁸ A Zero Waste resolution is an important first step that will establish the foundation for continued improvement and innovation within waste management services.

Waste Less, Pay Less

The City should encourage the County to create a structure that

allows businesses and residents to save money when they reduce their waste and recycle. Just as our utility bills are based on how much water or electricity we use, we should be billed only for the solid waste we throw away.

According to a federal EPA analysis, implementing such a system is “the single most effective action that can increase recycling and diversion, and can also be one of the most cost effective.”⁹ More than 7,000 municipalities nationwide, including 30% of the largest cities, use some form of this “unit-based” pricing.¹⁰ Fortunately, unit-based

pricing does not significantly increase illegal dumping of trash, as might be expected.¹¹

In the City of Charleston, unit-based pricing could divert more than 50% of the waste stream, or roughly 30,000 tons of waste per year, according to a federal Environmental Protection Agency calculation. This would save the City \$1.2 million annually in landfill costs.¹²

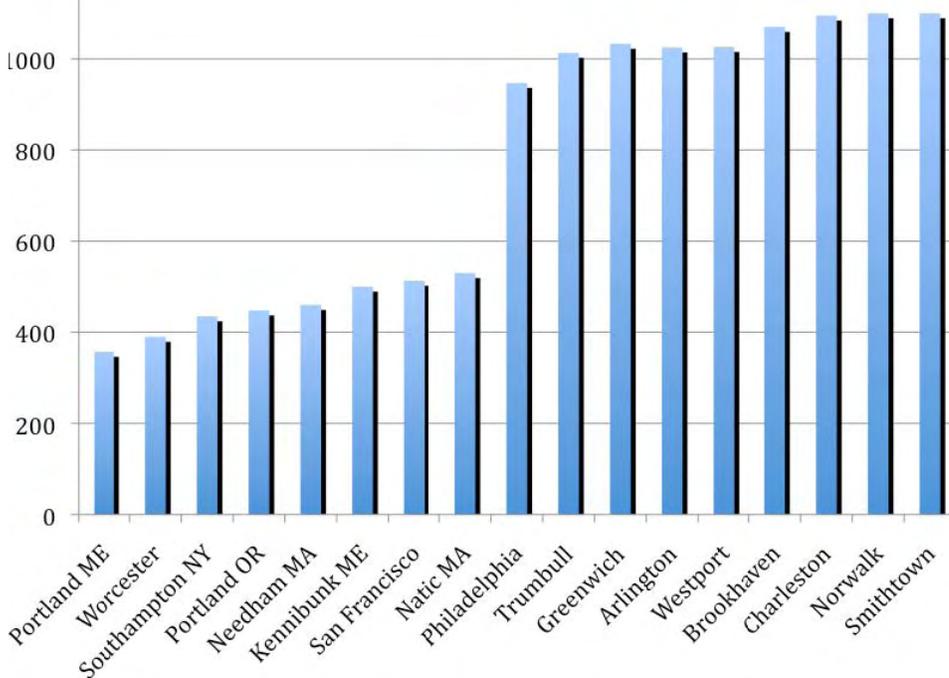
Purchase Wisely

This plan encourages the City to adopt a policy on “Environmentally Preferable Purchasing” (EPP). EPP programs require employees to reduce waste by purchasing products that are nontoxic, durable, repairable, long lasting, recyclable, compostable, energy efficient, and/or third party tested, when these products are comparable in life cycle cost and quality.

Benefits of EPP programs can include significant cost savings. Rather than buying cheap throwaway items again and again, EPP programs analyze costs throughout a product’s lifecycle.

Many municipalities, states, and the federal government have such programs, as do major corporations. The South Carolina DHEC recently drafted a policy for our state agencies and state universities. The City will set a

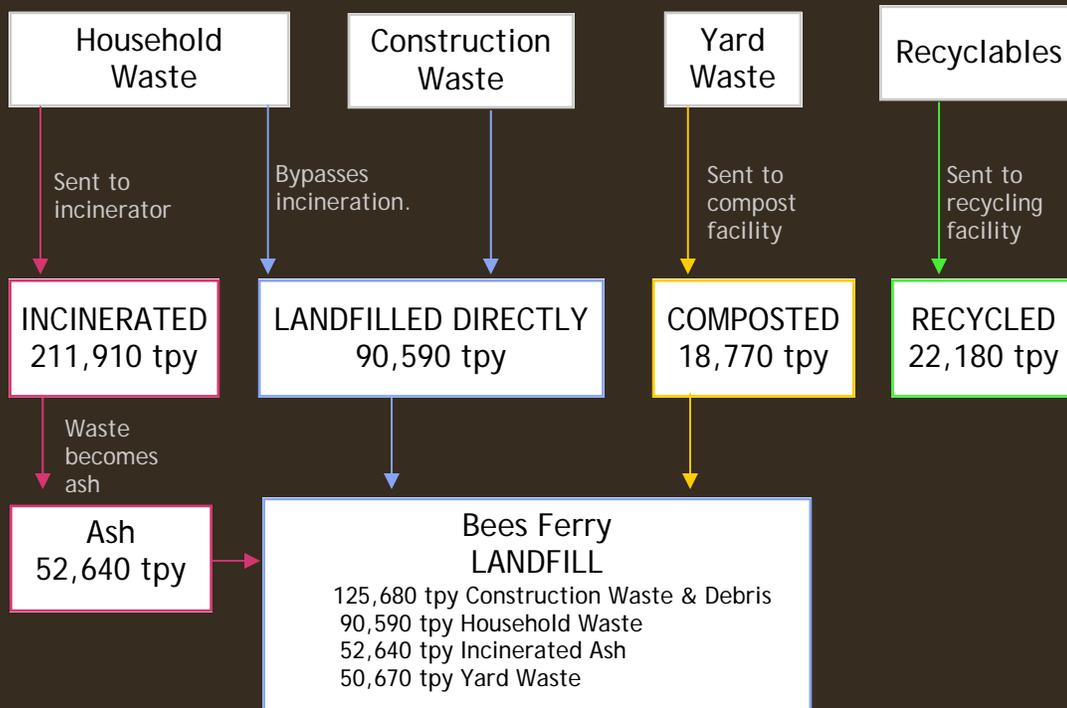
PER CAPITA WASTE IN COMMUNITIES SIMILAR TO CHARLESTON



The communities that pay the true cost of waste disposal are incentivized to waste less. Communities on the left use unit-based pricing with weekly curbside recycling, those on the right use only weekly curbside recycling.

Source: Kristen Brown, Green Waste Solutions

THE WEB OF WASTE MANAGEMENT



South Carolinians generate an average of 6.3 lbs of waste per day, of which approximately 4.3 lbs are disposed of via landfill or incineration and 2 lbs are recycled.

The category of waste most familiar to us is called municipal solid waste (MSW), and consists of common household waste materials such as paper, plastics, glass, textiles, tin and aluminum cans, food waste and yard debris.

MSW accounts for about 35% of South Carolina's total solid waste stream (TSW) - distinct from construction and demolition waste (C&D), which constitutes about 23%, and industrial solid waste, which includes agricultural, mining and manufacturing waste, which makes up the remaining 42% of the state's TSW.

In Charleston County, the municipalities are responsible for pick-up and hauling of residential waste, while the County provides recycling pick-up and maintains the disposal facilities. Until 2010, the County operated three facilities for waste and refuse disposal: Bees Ferry Landfill, the Montenay Incinerator, and Jenkins Recycling Center.

In 2009, Charleston County decided to no longer use the incinerator for garbage disposal. The County committed, instead, to increasing recycling rates in order to offset some of the increased MSW going to Bees Ferry; as well as explore alternative disposal methods to reduce the amount of waste sent to our landfill.

*TPY: ton per year

valuable standard for its employees, businesses, and residents by establishing such a policy.

Rethink Organic Waste

One of the biggest challenges in waste management is organic waste - food scraps, yard trimmings, soiled paper, and other organic materials. In Charleston, food scraps and yard trimmings make up roughly 35% of the household waste stream. When we bury these materials in a landfill, it releases methane gas - a greenhouse gas 21 times more potent than Co2.¹³

The solution, as communities across the country are discovering, is to compost organic waste. This process dramatically reduces methane emissions, produces a product that can be used or sold to farmers, landscapers and gardeners, and allows waste



Credit: Georgia Downey

Children get hands-on with food scraps during a vermicomposting workshop.

to reenter the natural cycle rather than being sent to the landfill.

In September 2009, Charleston County Council voted to compost all yard waste brought to the Bees Ferry Landfill, and to investigate the potential to compost other organic waste as well.¹⁴ Cities in North Carolina, Minnesota, Michigan, Colorado, California, and Washington State are collecting organic material, including food scraps, for composting.¹⁵ San Francisco has the premier organic waste program in the country. More than 400 tons of organic waste, including food scraps, are collected at the curb each day and composted.¹⁶ Among the recommendations, therefore, is to support composting opportunities throughout the City.

Increase Recycling

Recycling is a critical element of any waste management system. Recycling not only reduces pollution associated with waste disposal; it also reduces the pollution, environmental damage, and heat-trapping emissions associated with extracting, transporting, and processing

Mohawk Carpet: cradle to cradle manufacturing



Mohawk Carpet, located in Summerville, Ga is a large scale purchaser of Charleston County's soda and water bottles. Last year they purchased 128 tons of Charleston County's #1 bottles.

Annually, they keep 3 billion bottles out of landfills by processing 25% of all the bottles collected in North America made from polyethylene terephthalate (PET, #1) to produce 170 million pounds of recycled fiber for the production of carpet. Mohawk carpets are sold by retailers throughout Charleston County, and is marketed with its ReCover program allowing customers to have old carpet picked up and recycled into new products, or into new Mohawk carpet.

By purchasing recycled materials Mohawk achieves:

- smarter resource use,
- lower emissions from recycled production and regionalized transportation cycles,
- reduced landfill tonnages,
- higher rates of job creation and
- better stewardship.

virgin materials. Moreover, recycling saves energy: producing an aluminum can from virgin materials, for example, requires 20 times more energy than when recycled metal is used.

The City should therefore adopt, or encourage the County to adopt, the following policies (some of which are already in the planning stages):

Increase construction and demolition waste diversion (recycling and salvage/reuse):

In South Carolina, construction and demolition (C&D) waste represents roughly one-quarter of our total solid waste stream,¹⁸ yet only about one-third of it is typically recycled.¹⁹ It is possible, however, to divert 90% of construction job site waste and 80% of demolition waste from the landfill.²⁰ Some cities require 50% - 90% diversion, depending on the type of construction waste.²¹ The City, therefore, should commit to diverting a high percentage of its own construction waste. The City should also encourage private builders, with incentives, to recycle, ultimately moving toward specific recycling requirements tied to building permits and building inspections.

Make recycling easy, and

mandatory: According to the County's solid waste consultant, we could more than double our current residential recycling rate of 22,000 tons per year, recycling 45,000 tons instead. To accomplish this goal, we should make recycling as easy as throwing out garbage. For example, recycling collection should be as frequent as garbage collection, and larger, rolling recycling containers should be available. Also, recycling should be required for both homes and businesses.

Recycling is mandatory in many cities across the country, including Pittsburgh, Seattle, San Diego, Wilmington, North Carolina, and Cambridge, Massachusetts.²²

Expand Materials Collected:

Residential curbside recycling pickup should be expanded to include cardboard and all plastics #1 through #7, not just the plastics bottles, jugs and jars #1 and #2 that are currently accepted.

- Cardboard is roughly one-quarter of all municipal recyclables collected in South Carolina.²³ Charleston County does recycle cardboard, yet does not provide curbside pickup due to the limited



Charleston County recycles 10% of the municipal waste stream. In 2009 it established a goal of increasing recycling to 40%.

capability of the current recycling truck fleet to hold large sheets of cardboard. The solution is to use a compactor truck, typical for garbage collection, to haul cardboard for recycling.

- Plastics #3 through #7 and #1 and #2 other than bottles, jugs, and jars are not currently accepted by the County for recycling. The recommendation encourages the County to explore commodities markets for these plastics, and expand curbside recycling pickup to include them. While plastics account for a small percentage of total recyclables collected in South Carolina (2%), they

AIRPORT RECYCLES



Credit: Charleston County Aviation Authority

The Charleston County Aviation Authority successfully launched their Recycling Program in July of 2009. Significant in that commercial recycling is entirely voluntary and they worked closely with the Charleston County Government and DHEC to train their employees and obtain the proper receptacles. They successfully diverted 90 tons of trash from the landfill over the first nine months and helped lead the way for other commercial operations to reduce their waste streams and demonstrate there are cost savings to be realized at the same time.

The education of their tenants and staffs will undoubtedly extend beyond the daily operations and into their personal lives as well. Prominent recycling messages also set an important tone for the many visitors coming through the airport letting them know Charlestonians are proud of their natural environment and are working to retain the beauty and character of Charleston.

are a rapidly growing segment of our municipal solid waste stream.²⁴ Therefore, capitalizing on recycling opportunities to keep plastics out of the landfills will have a great impact on overall waste reduction.

Provide public recycling bins, and require recycling at events. Public and event recycling are visible statements of the City's commitment to zero waste. We should not underestimate how important this can be for visitors from places where recycling is the norm.

Energy Recovery Technologies and Landfill

Efforts such as unit-based pricing, environmentally preferable purchasing, composting, and recycling should reduce our waste stream by 40% or better. While we are working to reduce our waste stream to as close to zero as possible, the residual solid waste could be converted to an energy source. Creating energy from our residual solid waste would be preferable to landfilling. All such energy recovery technologies should meet or exceed federal and state air quality standards and should recycle materials like 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.



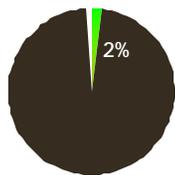
Credit: MUSC

MUSC has an aggressive recycling program which significantly reduces the waste stream from all campus sources.



The second annual Green Fair recorded a 93% waste diversion rate. Vendors were required to use compostable and recyclable materials and participants were encouraged to use reusable containers.

Zero Waste Goals, Actions & Recommendations



Quantifiable measures related to W.1 could achieve 2% of 2030 reduction goal (equal to 22,860 mtCO₂e).
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.¹

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.stoptrashingthecclimate.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).²

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).³ 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%.⁴

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
- A model EPP policy is available from Alameda County, California: 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.⁵ 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.⁶ 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.⁷

Compost, when used in organic farms and gardens, actually captures carbon dioxide the way a forest would, slowing climate change.⁸ Also, compost is a marketable product.⁹ 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.¹⁰
- 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.¹¹

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.

eandf/sustainability/c_d
Other cities: Austin, TX

- **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/>

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
 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;¹²
- 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

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/recycereg.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

San Francisco: 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
Cambridge, MA www.cambridgema.gov

W-21: 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
Sustainable Event and Sport Toolkit (online)
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.¹³

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).¹⁴ 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.)¹⁵

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

Improved Transportation

1. See "Growing Cooler: The Evidence on Urban Development and Climate Change," Urban Land Institute 2007), at 4, <http://www.smartgrowthamerica.org/documents/growingcoolerCH1.pdf>.
2. *Id.* at 2, 4. *Id.*
3. *Id.* at 4.
4. See "A New Vision for the 21st Century," AASHTO (2007), summarized at <http://www.transportation.org/news/121.aspx>. *Id.*
5. See "Growing Cooler: The Evidence on Urban Development and Climate Change," Urban Land Institute (2007), at 4, 7, <http://www.smartgrowthamerica.org/documents/growingcoolerCH1.pdf>.
6. See "Outer Limits: Sprawling Atlanta Seeks New Routes to the Future," *Grist* (14 May 2008), <http://www.atlanticstation.com/press/Sprawling%20Atlanta%20seeks%20new%20routes%20to%20the%20future%20|%20By%20Robert%20DiGiacomo%20|%20Grist%20|%20Grist%20Feature%20|%2014%20May%202008.pdf>.
7. See "Fast Track for Commuter Rail," *Post & Courier* (14 March 2008), http://www.postandcourier.com/news/2008/mar/14/fast_track_commuter_rail33776/.
8. See "Ridership Ahead of Schedule," *Charlotte Observer* (12 July 2008), <http://www.charlotteobserver.com/local/story/76813.html?q=light%20rail%2016,479>. See "Charlotte Light Rail Line Exceeds First-Year Ridership Goals," *Smart Growth News* (2009) <http://www.smartgrowth.org/news/article.asp?art=7208&res=1280>.
9. See "Charlotte Light Rail Line Exceeds First-Year Ridership Goals," *Smart Growth News* (2009) <http://www.smartgrowth.org/news/article.asp?art=7208&res=1280>.
10. See "Charlotte's New Lynx Light Rail," *Light Rail Now* (2008), http://www.lightrailnow.org/news/n_cha_2008-08a.htm.
11. *Id.*
12. See "Light Rail in Charlotte," www.Joe Urban.com (2009), <http://joe-urban.com/wp-content/uploads/2009/08/light-rail-in-charlotte-july-20091.pdf>.
13. See, e.g., "South End Development Fits Transit-Oriented Plan," *Charlotte Observer* (20 July 2008), <http://www.charlotteobserver.com/opinion/story/85469.html?q=light%20rail%20%22transit%20oriented%22>; "Rezoning Requests to be Considered," *Charlotte Observer* (14 Sept 2008), <http://www.charlotteobserver.com/277/story/175039.html?q=light%20rail%20%22transit%20oriented%22>.
14. See "Light Rail in Charlotte," www.Joe Urban.com (2009), <http://joe-urban.com/wp-content/uploads/2009/08/light-rail-in-charlotte-july-20091.pdf>.
15. See "State of the Air 2007," American Lung Association, at 6, http://www.lbamspray.com/00_Health/American%20Lung%20Association.pdf.
16. See "Physicians are Concerned about Dangers of Air Pollution," *Post & Courier* (2 July 2008), <http://www.postandcourier.com/news/2008/jul/02/>

[physicians are concerned about dangers air polluti/](#); Charleston County Medical Society resolution confirmed by e-mail with staff Kaye Wallen on 28 Sept 2009.

Improved Transportation Recommendations

1. See www.completestreets.org.
2. Census 2007 American Community Survey.
3. http://www.irs.gov/publications/p15b/ar02.html#en_US_publink1000101852
4. www.hybridcars.com/oil-dependence
5. <http://www.fueleconomy.gov/feg/driveHabits.shtml>
6. LEED Category - Sustainable Sites - 4.3

Zero Waste

1. See "Trash Strategies Approved," *Post & Courier* (2 Sept 2009), <http://www.postandcourier.com/news/2009/sep/02/trash-strategies-approved/>.
2. *Id.*
3. See "Waste Management 2008 Rankings," [www.SustainLane.com](http://www.sustainlane.com), <http://www.sustainlane.com/us-city-rankings/categories/waste-management>.
4. "California Reports 58 Percent Waste Diversion," *Recycling Today* (8 Jan 2009); <http://www.recyclingtoday.com/news/news.asp?ID=14485>; "Maryland's 47.5 Percent Diversion Rate," Maryland Department of the Environment (2007), <http://www.mde.maryland.gov/Programs/LandPrograms/Recycling/Local/recyclingrates.asp>.
5. See "Safeway's Waste Diversion Rate: 85 Percent," www.GreenBiz.com (14 May 2009), <http://www.greenbiz.com/news/2009/05/14/safeways-waste-diversion-rate-85-percent>; "Waste and Recycling," Global Citizenship at HP (2009), <http://www.hp.com/hpinfo/globalcitizenship/gcreport/operations/waste.html>.
6. See "10 Fixes for the Planet," *Newsweek* (14 April 2008), <http://www.newsweek.com/id/130625/page/1>.
7. "Atlanta to Launch Southeast's First Zero Waste Zone," *U.S. Environmental Protection Agency* (12 Feb 2009), <http://yosemite.epa.gov/opa/admpress.nsf/2ac652c59703a4738525735900400c2c/4f7604c1b53aa8cd8525755b00781318?OpenDocument>.
8. See "What's Your Take on Zero Waste?" *Austin City Connection*, <http://www.ci.austin.tx.us/sws/0waste.htm>; "A Resolution Supporting the Creation of a Zero Waste Plan," Grassroots Recycling Network (1998), <http://www.grrn.org/zerowaste/CZWRes.html>.
9. See "Pay as You Throw (PAYT) in the U.S.: 2006 Update and Analyses," U.S. Environmental Protection Agency Office of Solid Waste (2006) at 1 <http://www.epa.gov/waste/conserves/tools/payt/pdf/sera06.pdf>.
10. See "Pay as You Throw (PAYT) in the U.S.: 2006 Update and Analyses," U.S. Environmental Protection Agency Office of Solid Waste (2006) at 1 <http://www.epa.gov/waste/>



[consERVE/tools/payt/pdf/sera06.pdf](http://www.epa.gov/waste/consERVE/tools/payt/pdf/sera06.pdf).

11. This was the finding of a Duke University study involving 212 communities. In fact, in 6% of communities *using this system litter actually decreased*. See "New Study Documents Pay-As-You-Throw Results," U.S. Environmental Protection Agency Office of Solid Waste (1997), <http://www.epa.gov/waste/consERVE/tools/payt/tools/bulletin/bullet.htm>. Also, communities have developed ways to make sure that unit-based pricing does not have an unfair impact on low-income residents - for example distributing free or reduced-cost stickers or bags to families who qualify for other assistance programs. See "Variable-Rate or 'Pay-as-you-throw' Waste Management: Answers to Frequently Asked Questions," Reason Public Policy Institute (2002) at 17, <http://reason.org/files/a4e176b96ff713f3dec9a3336cafd71c.pdf>.
12. See "The City of Charleston South Carolina SMART Waste Management," US Environmental Protection Agency, Green Waste Solutions, ICF International (2009), at 12-13, available from Kirsten Brown, Green Waste Solutions. Rockville Center, NY, Kristen@thewastesolution.com.
13. See "Methane as a Greenhouse Gas," U.S. Climate Change Science Program (2006), <http://www.climatechange.gov/infosheets/highlight1/default.htm>.
14. See "Trash Strategies Approved," *Post & Courier* (2 Sept 2009), <http://www.postandcourier.com/news/2009/sep/02/trash-strategies-approved/>.
15. See "Composting Practices for Organics," *COOL2012.com* (2009), <http://www.cool2012.com/community/collection/>.
16. See "Composting," *www.sfenvironment.org* (2009), http://www.sfenvironment.org/our_programs/topics.html?ti=6.
17. See "Common Waste and Materials: Aluminum," U.S. Environmental Protection Agency (2008), <http://www.epa.gov/osw/consERVE/materials/alum.htm>.
18. See "Construction and Demolition," *SC Solid Waste Management Annual Report* (2008) at 71, <http://www.scdhec.gov/environment/lwm/recycle/pubs/section7.pdf>.
19. *Id.*
20. See "Construction Waste Management," *National Institute of Building Sciences Whole Building Design Guide* (2008), <http://www.wbdg.org/resources/cwmgmt.php>.
21. See "Local Government Sample Documents," California Integrated Waste Management Board (2009), <http://www.ciwmb.ca.gov/ConDemo/SampleDocs/>.
22. See articles at <http://mandatoryrecycling.org/>; see also "New Recycling Regulations Go into Effect," WWAY Channel 3 (21 Sept 2009), http://www.wwaytv3.com/new_recycling_regulations_set_go_effect/09/2009/; "Mandatory Recycling," Cambridge Department of Public Works, <http://www.cambridgema.gov/TheWorks/departments/recycle/ordinance.html>.
23. See "MSW Recycling: Markets and Commodities," *SC Solid Waste Management Annual Report* (2008) at 13, 20, <http://www.scdhec.gov/environment/lwm/recycle/pubs/section3.pdf>.
24. *Id.*
25. See "Coca-Cola, URRC Open World's Largest Plastic Bottle-to-Bottle Recycling Plant."

www.thecoca-colacompany.com (14 Jan 2009), http://www.thecoca-colacompany.com/presscenter/nr_20090114_bottle-to-bottle_recycling.html.

26. "Coke Opening World's Largest Bottle-to-Bottle Recycling Plant," *Huffington Post* (15 Jan 2009), http://www.huffingtonpost.com/2009/01/15/coke-opening-worlds-large_n_158280.html.

Zero Waste Recommendations

1. *Wasting and Recycling in the United States 2000*: <http://www.grrn.org/order/w2kinfo.html>
2. The EPA created WARM to help solid waste planners and organizations track and report greenhouse gas emissions reductions and energy savings from several different waste management practices. The calculator is available at: http://www.epa.gov/climatechange/wycd/waste/calculators/Warm_home.html.
3. Available at: http://www.epa.gov/climatechange/wycd/waste/calculators/Warm_home.html.
4. See *American City and County* (Oct 2003) http://americacityandcounty.com/mag/government_payasyouthrow_payoff/
5. The city of Boulder, CO tested two curbside compost pilot programs, leading to a 60% waste diversion. Post-pilot, current diversion is 40%
6. See http://www.sfenvironment.org/our_programs/topics.html?ti=6.
7. See <http://www.cool2012.com/community/collection/>.
8. Four European countries have actually changed their emission-reduction targets for the Kyoto Protocol to include contributions from organic agriculture. See http://www.rodaleinstitute.org/files/Rodale_Research_Paper-5-28-08.pdf at 5.
9. Whole Foods now composts the organic waste from its Southeastern stores, then resells it in tiny, expensive packages. See http://www.farmerd.com/product/farmer_d_compost_16qt/composting
10. The EPA estimates that .05 metric tons of carbon equivalent per wet ton of finished compost is sequestered after 10 years. <http://www.epa.gov/climatechange/wycd/waste/downloads/chapter4.pdf>
11. See <http://www.scdhec.net/environment/lwm/recycle/pubs/e-waste.pdf>.
12. EPA , Common Waste and Materials: <http://www.epa.gov/osw/conserves/materials/index.htm>
13. Energy Justice Network: <http://www.energyjustice.net/lfg/>
14. Available at: http://www.epa.gov/climatechange/wycd/waste/calculators/Warm_home.html.
15. <http://www.scgreenbuildingdirectory.org/>



