February 16, 2012

Comprehensive Report and Recommendations
University of South Carolina

Report

Resource Recycling Systems
Sustainable Systems for a Waste-Free Future

INTRODUCTION

The University of South Carolina (USC) has over 200 years of history and tradition dating back to the first campus building "the Horseshoe" in 1805. USC's most well known campus is located in Columbia, the capital of South Carolina, and has approximately 29,334 students and 1,560 faculty providing over 324 degree programs.

USC's recycling program began back in 1989 with the organization of a Recycling Task Force. This Task Force comprised of students, faculty and administrators started looking at solid waste issues and brought the idea of waste reduction and recycling to the University forefront. The framework set by this Task Force allowed for the formation of the Recycling Office in 1990. Recycling was focused on the collection of white office paper, newspaper and aluminum by volunteers and work study students. The program began collecting less than 10 tons of recycling from a small group of campus departments.

Since that time, USC's recycling has expanded to include the majority of campus classroom buildings, the student union, residential housing, the Greek Village and Gamecock athletic events. USC's Environmental Services Department provides a wide range of recycling opportunities including the collection of mixed office paper, aluminum cans, plastic bottles, glass, corrugated cardboard, phone books, batteries, light bulbs, ink/laser toner cartridges, scrap metal and electronic scrap.

In addition to these services which are provided "in-house", the University also provides "in-house" waste collection services in addition to a variety of contracted service vendors that handle waste compactors, roll-off dumpsters and grease recycling containers scattered throughout campus.

The University is committed to developing and maintaining an environment that enhances human health and fosters a transition toward sustainability. To that end, Environmental Services is committed to continuous improvement in demonstrating institutional practices that promote sustainability, including measures to increase efficiency and use of renewable resources, and to decrease production of solid waste and hazardous materials.

In an effort to fulfill this commitment, the University hired Resource Recycling Systems to help bring best practices and program recommendations presented in financial and accounting language to provide solid and practically actionable solutions. Our work will provide USC with the following list of actionable items and documents to help expand the reach of current waste reduction and sustainability efforts.

- Comprehensive solid waste audit report
- Comprehensive waste management services financial audit
- Future campus and student trend analysis affecting solid waste services and operation
- Campus-wide waste reduction and recycling recommendations
- Comprehensive waste reduction and recycling implementation plan

During our site visits and meetings in 2011, Resource Recycling Systems is providing this final report and recommendations to the Environmental Services Department.

FINAL REPORT, RECOMMENDATIONS AND IMPLEMENTATION PLAN

EXECUTIVE SUMMARY

INTRODUCTION

The University of South Carolina (USC) hired Resource Recycling Systems (RRS) at the end of 2010 to provide comprehensive documentation and a baseline evaluation to the Environmental Services Department for their waste reduction, recycling services and general waste collection operation. RRS has spent significant time on campus to compare the existing program against best practices and understand regional capabilities, and has prepared our analysis in a financial framework to provide solid and practically actionable recommendations for the Department to capitalize upon.

2011 SITE VISITS AND MEETINGS

During the 2011 year, RRS conducted several site visits and met with key University departments to fully understand current waste reduction and recycling activities and programs. In addition to meeting with University personnel, RRS visited and reviewed core service providers within the region including all facilities servicing University materials, and other community stakeholders. These site visits and meetings provided a foundation from which RRS drew upon for our analysis and recommendations

SUSTAINABILITY AT USC

The Office of Sustainability oversees campus sustainability at the University of South Carolina. The Office not only provides a mission and vision for the campus, it also provides goals, campaigns and green teams to make sustainability actionable.

As a part of these goals, the Environmental Services Department has been tasked to partner with the Office to work on the following long term sustainability goals.

- Increase overall recycling rate to 40% by 2015
- Divert 75% of construction and demolition waste by 2015
- Become a zero waste campus by 2050
- Change campus culture to improve campus cleanliness and recycling
- Reduce the hours to clean classroom litter by 20% by 2012

The Environmental Services Department has created a set of short term strategies/goals in an effort to accomplish the above long term goals which are outlined later in this report.

ENVIRONMENTAL SERVICES DEPARTMENT SERVICES

RRS worked with staff in the Environmental Service Department to understand the range of services they provide to the campus as a whole. As a part of this work and analysis, we identified the actual Department services provided, diagramed material flows for these various services, captured equipment and labor allocations, and developed more precise budgets surrounding these services.

The Environmental Services Department provides a comprehensive set of "in-house" waste and recycling collection services to the University, which is supplemented by an additional set of services that are handled by an outside contractor.

Waste collection-

six days a week	compactors/open top dumpsters	two front load Mack compacting trucks
WM contract	40 cubic yard compactors/dumpsters	roll off unit
2009/10	4,223 tons	$154,310 annually (excluding WM)

Cardboard recycling collection-

Tuesday	dumpsters	one front load Mack compacting truck.
On call	vertical balers	lift truck/bakery truck
2009-2010	145 loose /58 baled tons	$19,289/$11,061 annually

A revenue share agreement with Pratt Industries of $144 per ton is given to Environmental Services for both their loose and baled cardboard.

Office paper recycling collection-

Thursday	multiple containers	one front load Mack compacting truck
2009-2010	132 tons	$27,350 annually

A revenue share agreement with Pratt Industries of $190 per ton is given to Environmental Services for this loose office paper.

Commingled bottles/cans, newspaper and mixed paper recycling collection-

five days a week	multiple containers	two passenger vans
2009-2010	75 tons	$139,362 annually

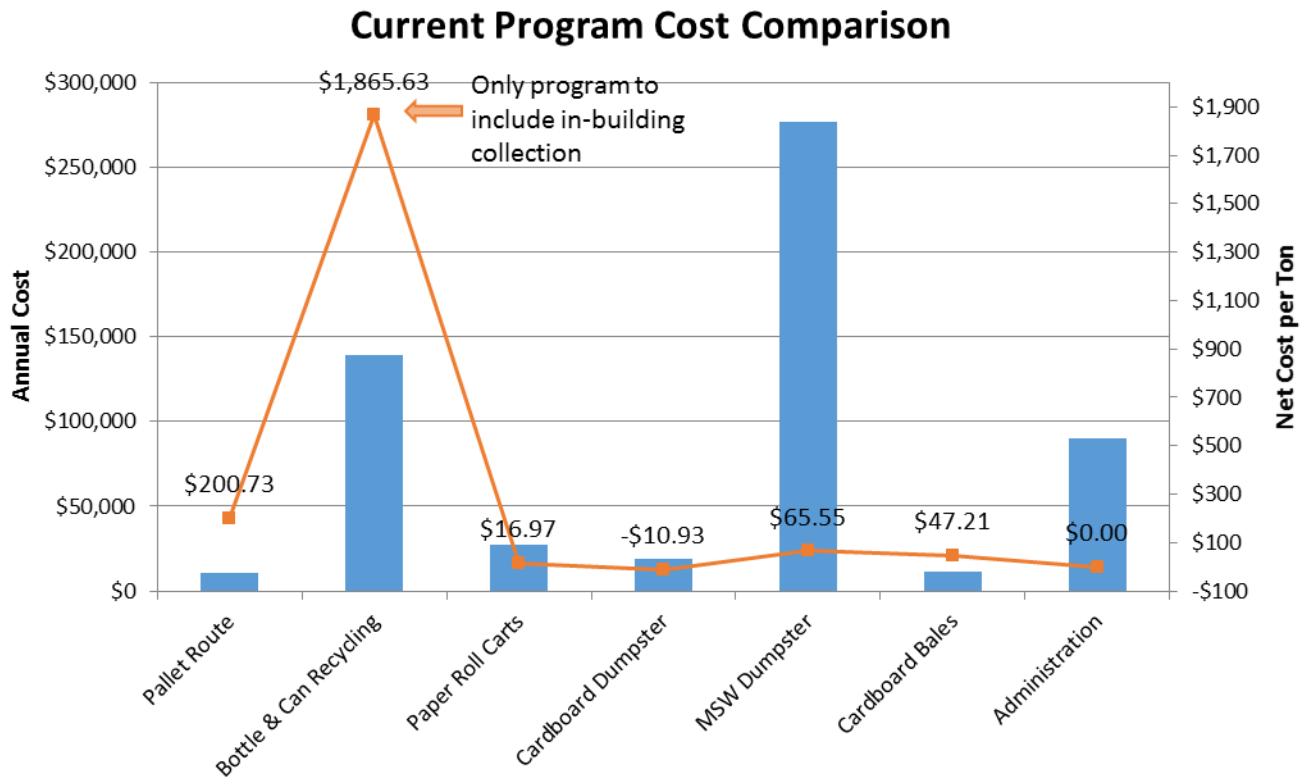
A revenue share with Pratt Industries of $93.50 per ton would be given to Environmental Services for their #8 news materials and $89.25 per ton for mixed paper. Pratt did not give a revenue share for the commingled bottles and cans.

Scrap wood/pallet recycling collection –

weekly/ "on-call"		pick-up truck
2009-2010	54 tons	$10,840 annually

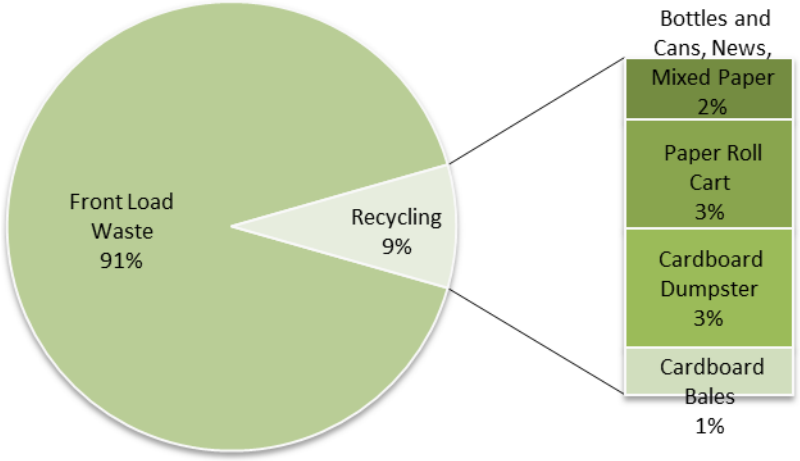
The City of Columbia collects glass recycling on campus every Friday, free of charge for the University. Glass materials are transported from locations across campus to one of three glass collection areas on campus for the City to service.

Program	Pallet Route	Recycling - Total	Paper Roll Cart	Cardboard Dumpster	Cardboard Bales	Trash
Collection Labor	$6,943.93	$98,606.47	$11,600.76	$6,943.93	$6,943.93	$55,551.47
Capital	$495.70	$6,755.93	$8,948.80	$5,544.92	$716.89	$44,359.36
O&M	$3,400.00	$34,000.00	$6,800.00	$6,800.00	$3,400.00	$54,400.00
Administrative						
Total Expenses	$10,839.63	$139,362.40	$27,349.56	$19,288.85	$11,060.82	$154,310.84
Tons (FY 09-10)	54	75	132	145	58	4223
Cost/Pickup	$9.93	$10.98	$6.19	$6.62	$26.59	$6.16
Cost/Ton	$200.73	$1,865.63	$206.97	$133.07	$191.21	$36.54
Waste Disposal ($/Ton)						$29.01
Potential Revenue ($/Ton)	$0.00	$0.00	$190.00	$144.00	$144.00	
Net Cost per Pickup	$9.93	$10.98	$0.51	-$0.54	$6.57	$11.04
Net Cost per Ton	$200.73	$1,865.63	$16.97	-$10.93	$47.21	$65.55

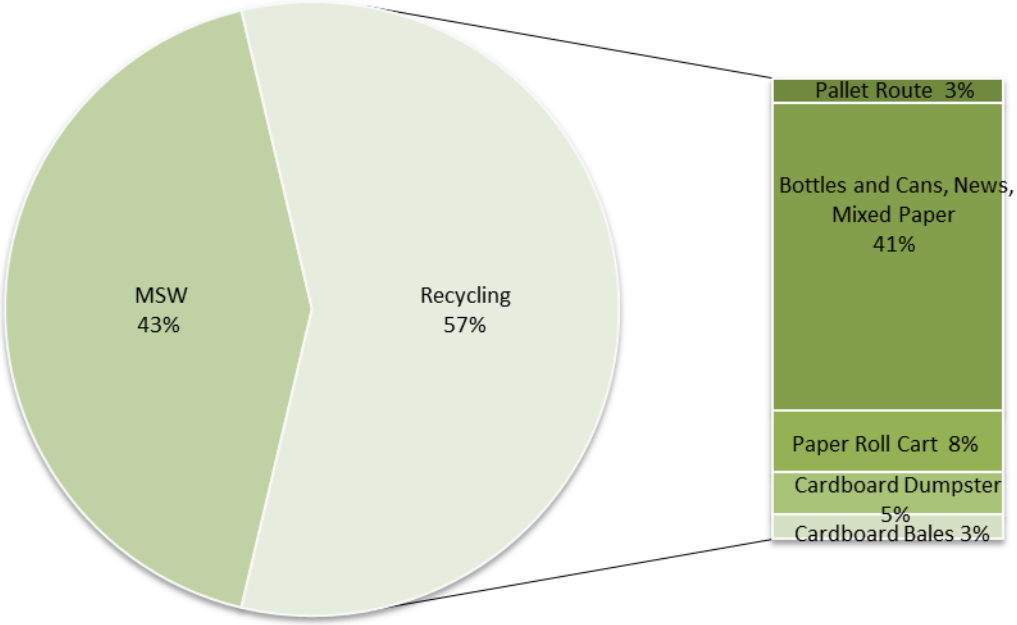


In the 2009-2010 fiscal year, it is estimated that 9% of materials collected (by weight) on campus were actually recycled. This calculation only includes waste and recycling services provided by the Environmental Services Department and Gamecock Trash Company. The calculation excludes all roll-off waste services and services provided by outside vendors.

Waste Captured - % by weight



Environmental Services Cost Estimate - % of Costs Allocated to Each Waste Stream



ENVIRONMENTAL SERVICES DEPARTMENT STRENGTHS/ASSETS

- Significant Capital Investment - There has been significant investments in needed capital to provide comprehensive services throughout campus, including rolling stock, containers and fleet. Regular replacement and technology improvements must continue to be a part of the department's outlays to insure continued service. Some equipment is not fully utilized (front loaders), while some is less than optimal for maximum efficiency (vertical balers).

- Competent Waste Services Industry Orientation - The waste and refuse service developed by the department is responsive to the demanding service environment of a compact, old, and urbanized campus. Responsiveness and concern for maintaining a clean campus, addressing service fluctuations, and providing a level of route efficiency is clear.

- Enterprise Fund and Billing Structure - The original development of Gamecock Waste as an Enterprise within the University, and its capability to bill for service are excellent structural elements for maintaining a strong waste and recycling program. Like the capital, continued utilization of these assets are essential for continued optimal services.

- Cadre of Committed Professionals - Within the Department and throughout the University, RRS was met almost universally with a great deal of interest and willingness to support our efforts and to improve services for the University. The most common response was recognition that things needed some improvement but that there was a need for experience and direction.

- Diverse and Vibrant set of Initiatives - Many of the University departments, student groups and Sustainable Carolina house and conduct significant initiatives of various sizes and impact. When considered along with the willing attitudes from professionals on campus, this indicates an opportunity for conducting significant program realignment.

ENVIRONMENTAL SERVICES CHALLENGES

- Capital Investment Plan for Technology Efficiencies - Capital replacement and investments in technology to improve efficiency and increase recovery are essential for continued success of Gamecock Waste and Recycling. There is not currently a dedicated replacement fund, capital improvement plan, or strong vision/strategy around needed levels of investment.

- Waste Diversion Industry Orientation - Most of the professional experience and the program planning come from an orientation about managing wastes and then adding recycling services. This leads to increased costs, especially as recycling expands, and can cause disconnect when making service decisions. When combined with a desire for a "clean campus", recycling can be viewed as contrary as opposed to complementary to such efforts.

- Recycling Contracting and Integration - Actively managing the range of contract services is not currently a department prerogative, but will be essential to fully maximizing recovery in an affordable way.

Understanding financial opportunities (corrugated) and efficiencies (balancing routes) are important, but accessing new services such as single stream and food waste make this competency essential.

- University Wide "Waste Ethic" - Many students come from communities that do not currently have comprehensive programs, nor is there a long history of broad sustainability and recycling habits on campus. Recognition of this fact drives the current clean campus initiative, and serves as a significant challenge that needs to be addressed over the near and long term.

- Diverse and Vibrant Set of Initiatives - While there are many initiatives, they frequently are time limited or dependent on short term funding or prioritization by individual groups. Providing a strong set of services to support these initiatives and to use these efforts to develop new and improved sustainable programs should be the goal.

ENVIRONMENTAL SERVICES FINDINGS & VISION

The program has reached a plateau that will require significant realignment and restructuring to achieve the demands for increased recycling and sustainable programming. Significant changes have occurred within the recycling industry within the past number of years that have transformed the possibility for affordable and comprehensive recycling and the University has not kept up with these changes, including: number and type of materials accepted, materials handling and improvements in single stream processing, food waste collection and processing, educational outreach and Incentives, improvements in event and other specialty recycling, and changes in policy and contracting standards.

RRS has provided a series of recommendations that address the unique status of the University. We propose a program over the next five years that will flip flop the current diversion profile and develop an integrated recovery program. Our program is predicated upon developing clear, centralized and sustained program leadership and an investment in and utilization of the best technologies. Our program will seek to develop a broad-based "clean community" waste ethic over time. If achieved, the program will be efficient and sustainable through a commitment to technology, ongoing communications and focused training of staff and the University community.

REPORT RECOMMENDATIONS

TOP RECOMMENDATIONS

RRS is providing these following top recommendations that should be incorporated over the next five years. Efforts should focus on immediate steps, steps to be undertaken during the next year, and longer range activities during years 2-5.

Immediate Steps - RRS recommends that actions be taken immediately to address the following opportunities. These options will provide the quickest boost to recovery rates and can be accomplished with minimal expense and by repurposing existing capital, and provides the best chance to create immediate savings within the program. These steps are not contradictory to any future programming recommendations, and will aid in preparing the department for the more significant changes proposed.

1) Convert most recycling collections to single stream collection - significant reduction in collection expenses with minimal reduction, if any, in program revenues and will also work in concert with changes in the waste collection program.

2) Focus improvements on separate corrugated recovery program - revenue increase and reduction in waste services are immediately achievable by ensuring capture of all corrugated currently prepared for recycling and encouraging additional preparation

3) Reduce waste and recycling janitorial collections - no waste at desk and limited collection frequency. Single stream recycling should reduce number of containers, amount of waste generated, and "cleanliness" of desk side recyclables, allowing aggressive reduction of service provided at the desk.

4) Recycling education campaign focused on 'How' - all efforts should be focused on very simple how to information throughout all users. No attempts should be made here to do anything but very simply communicate simple tasks and requirements.

Tasks that require immediate resources and consideration are:

1) The process of repurposing as many existing bins as possible and to make all new purchases consistent with single stream approach

2) Negotiating best scenario regarding single stream recovery options with Pratt or Sonoco

3) Eliminate most/all OCC baling and increase front load collection as required

4) Keep How To Education very simple

Short term Steps - RRS recommends that steps begin in the near term to prepare for the upcoming school year by implementing the following steps.

1) Prepare Branding and Educational Initiative for "Gamecock Waste"- This process should include serious interdepartmental and community engagement and be considered in view of the strategic directives of the program. This will likely be ready for roll out for incoming freshman in 2013.

2) Develop Drop Off Capability @ Waste Yard—Providing additional services to other University departments as well as a backstop for Gamecock Waste activities make this a priority-especially if single stream transfer requires a location on campus.

3) Engage Athletics and other Special Opportunities- A significant boost in recycling rates, and the capturing of a lost client make this effort worthwhile. Single stream and corrugated recovery improvements discussed above should be the core of that program.

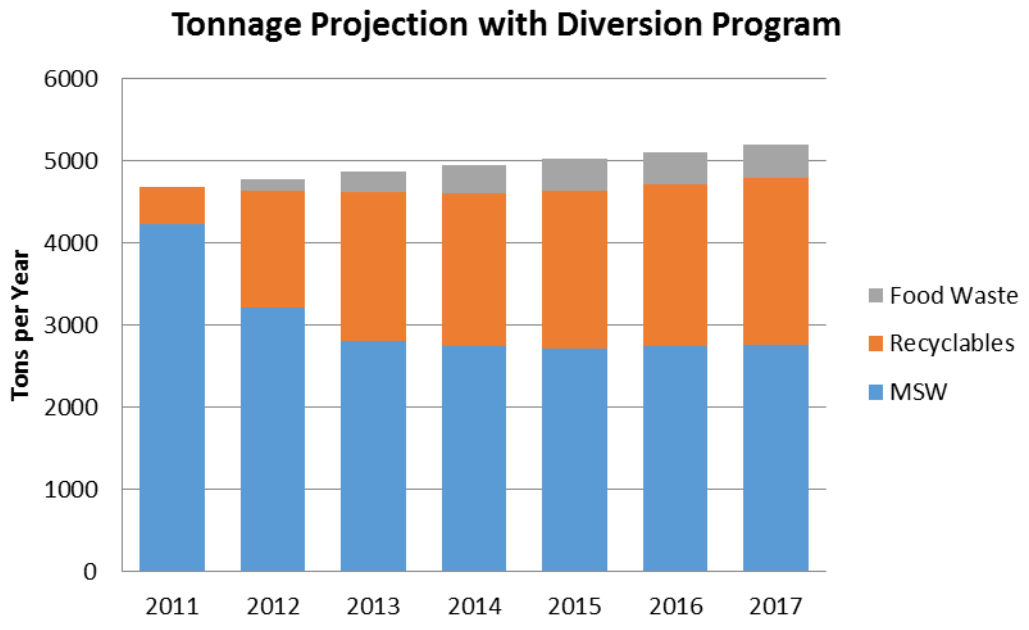
Intermediate Steps **-** RRS recommends that during the upcoming school year the program begin to implement the following steps.

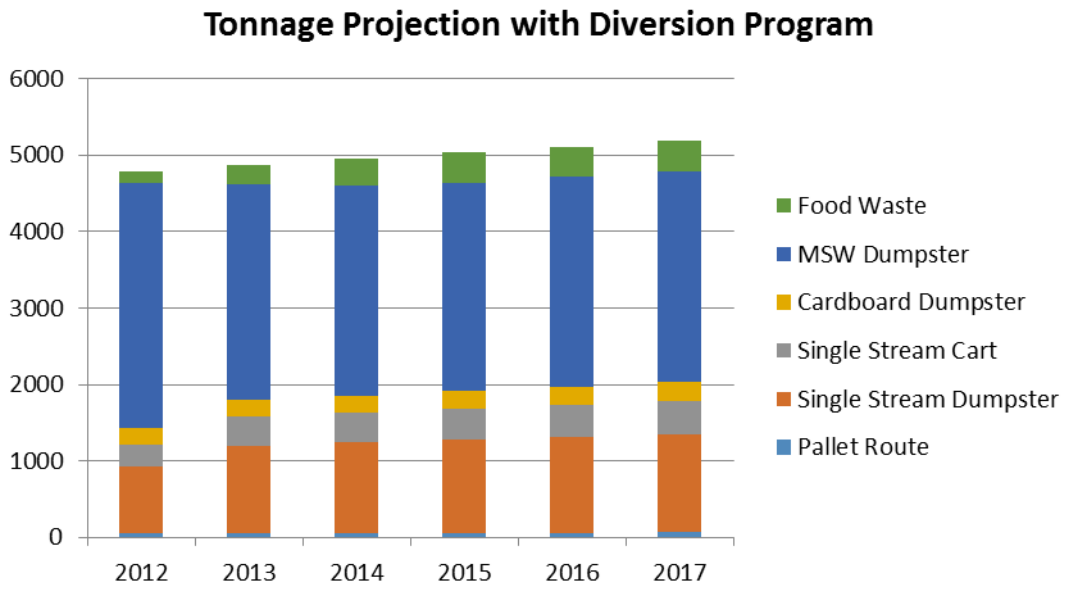
1) Develop Integrated Communications Campaign

2) Evaluate and Restructure all Waste Agreements

3) Initiate Food Waste Recovery Pilot/Start Up

To complete this transformation, the University will need to address a couple of important challenges including: Development of strong manager to lead waste diversion effort; Integration and focus with Sustainability Office and programs; Development of Campus wide "Waste Ethic" and Clean Community habits.





SINGLE STREAM RECYCLING

- Ease of collection
- 1 recycling collection container
- Efficiencies in collection and transportation

One of the strongest trends in recycling now is the move to single stream. This form of collection combines all recyclables into one container, including office paper, newspaper, cereal boxes, plastics, metals, and glass. Single stream collection simplifies the program for all participants in the recycling program including the users, custodial staff and haulers.

For students, faculty and staff, the recycling program will be the same all over campus. Every recycling bin that someone sees can accept the same material. Confusion about what materials are accepted is a big reason that people don't recycle as much as they could. This ease of use has been shown to significantly increase recycling.

For large institutions, this type of collection significantly reduces the work to collect the material in the buildings. It allows recycling collection to be as ubiquitous as trash collection, significantly expanding into collecting recyclables from offices, classrooms and common areas. Collection is simple and can be handled by custodial staff and not special recycling collectors. Many universities have stopped daily collection of waste from offices and added recycling collection, since most office waste generated can be recycled. This switch also reduces the workload on custodial staff.

For haulers, single stream recycling allows the use of larger containers including dumpsters and large rollcarts. These containers can be mechanically dumped by either front load or side load refuse vehicles. The main barrier to USC converting to single stream is the lack of quality facilities near the university. Facilities that USC could use for material processing are described in the Supplemental Information section. USC could also engage the two local processors, Sonoco and Pratt Industries, to see what transfer options they could provide. Both process single stream material at other facilities.

AT DESK RECYCLING/CENTRALIZED TRASH COLLECTION

- Recycling located at the desk
- Recycling collected 1 time per week – significant cost savings
- Centralized trash collection
- No more trash collection at the desk

CARDBOARD COLLECTED AS SEPARATE RECYCLING STREAM

- No more baling of cardboard
- Keep cardboard contract with Pratt
- Continue to collect as separate recycling stream
- Put more recycling dumpsters/collection areas for material on campus

ORGANICS MANAGEMENT

- Work with City to take yard waste instead of going in WM roll-off for the landfill
- Develop a food waste collection pilot program
- Work with Sodexo to use compostable dishware

MARKETING AND BRANDING OF GAMECOCK WASTE

- Uniform colors, signage and messaging
- Develop a sales campaign for the Department
- Identify them as a service provider
- Market themselves and services throughout campus
- Market themselves to Auxiliary building/locations/departments

5 YEAR SUSTAINABILITY INCORPORATION PLAN

- Differentiate the sustainability message
- Tie into Clean Campus initiatives

COLLECTION CONTAINERS RECOMMENDATIONS

In January 2011, RRS staff conducted a series of walk through waste assessments within several academic buildings and residence halls on campus. These assessments provided data on the number and type of recycling containers in the buildings, the number and type of waste containers and an overview of equipment at the loading dock. As a part of these walk through assessments, our staff identified "low hanging fruit" that would be easy to capture benefits from. These recommendations are listed below based on an implementation schedule over five years. For more details about our observations for each of these areas, see "Building Walk Through Assessments" section later in our report.

GENERAL CONTAINERS AND SIGNAGE

- The Environmental Services Department needs to fully understand what materials can be accepted as part of their processing arrangement with Pratt Industries at this time
- Identify the full list of materials that could be accepted as part of the recycling program
- Identify what materials can be commingled together to decrease the number of collection containers while increasing collection efficiencies and participation
- Develop a recycling logo, color scheme, and message that will brand the Department and it's operation
- Brand a uniform set of labels, signage and education message – everything needs to be uniform across campus (color scheme, font type, size of signage, etc.)
- Create uniformity in container signage and placement
- Hire 1-2 students for 15 – 20 hours/week that are focused on completing the following tasks
- Properly labeling containers
- Replace labels that need replacing
- Clean recycling containers
- Move recycling containers to the right location

WASTE WARRIORS RECYCLING CONTAINERS

- Units are large, expensive and not conducive for many buildings or available collection areas
- Would not recommend use as the Department's primary collection unit
- Would be beneficial to identify the Department's current inventory of these waste warrior units and appropriately distribute them across campus
- Waste warriors should be redistributed throughout buildings within higher traffic pattern areas
- Would recommend that the Department not purchase any additional waste warrior units until a decision is made on a dual or single stream collection system
- As stated above, identify ways to commingle materials within the same waste warrior container recycling bin/slot
- If program moves to a dual or single stream collection system, containers may need to be reconfigured
- Designate a slot/bin for trash as most of these waste warriors do not sit next to a trash container
- Differentiate this slot/bin so that it stands out against the other three recycling slots
- Paint waste warriors to allow them to stand out within the building (crimson red could be an ideal color)
- Provide signage on waste warrior – use the large containers front and sides to put recycling messages/identify materials collected
- Ensure that all of the collection slots are properly labeled

SLIM JIM RECYCLING CONTAINERS

- Would recommend that the Department not purchase any additional slim jim collection containers until a decision is made on a dual or single stream collection system
- Since these containers are slim/narrow they would not be optimum for a single stream collection program

- If a dual stream collection system is put into place, these containers would be more ideal for a commingled paper stream as opposed to a commingled bottle/can stream
- If the current collection system continues -
- The slim jim containers should be used within offices and department areas
- A container that accepts more recycling volume should be placed in the hallways, at centralized collection points and inside the large classrooms/auditoriums
- In both scenarios, ensure that a trash can is placed next to these containers
- Ensure that the slim jim collection containers are clean and properly labeled

RECYCLING ROLL CARTS

- Recycling roll carts should be for collecting and transporting recyclable materials throughout the building
- Since the recycling roll carts are large, bulky and are on wheels (travel away from areas easily) they are not ideal to use within the buildings as collection points – much better suited for transporting materials during collection procedures and used at the loading dock/outside collection areas for material storage.
- Roll carts could be used within waste/recycling rooms and/or building alcoves
- Not ideal to have in building hallways or small/tight space locations
- A strategy/set of collection containers needs to be established for the academic buildings – currently slim jim containers and rolling carts are used in these areas – not uniform across campus
- Lack of uniformity can be confusing for staff and students as they travel and work in the different buildings across campus
- Strategy and collection containers should be evaluated after a decision has been made on type of material processing system (i.e. multi-sort program, dual stream or single stream)
- Centralized collection areas need to be established and should be uniform throughout each building (i.e. if the centralized collection area is by the elevators, make sure that on all floors of the building have this area designated as the centralized collection area with the appropriate number of recycling bin and/or roll carts)
- If recycling roll carts are to be used within building at collection points, use a swap out arrangement for the roll carts when they are full/on their recycling pick-up day
- Empty, clean and properly labeled roll carts should be used to replace full roll carts – full carts should be placed out at curb for collection.
- After carts are emptied of recycling at the curb, carts should be inspected for cleanliness and proper signage.
- Empty carts should be placed at the loading dock/basement area of the building. These same carts will be used for the swap out the following week.
- Ensure that the recycling roll carts are clean and properly labeled

RUBBERMAID RECYCLING CONTAINERS

- The Rubbermaid recycling containers should be removed as collection containers throughout campus
- Rubbermaid recycling containers are not prominent enough capture the right attention for recycling
- Rubbermaid recycling containers do not have sufficient capacity for the collection of much material
- Rubbermaid recycling containers left in hallways and stairwells take up a significant floor footprint

- Rubbermaid recycling containers in a stacked scenario are unsteady in hallways and stairwells and create an inefficient collection process
- Rubbermaid recycling containers are not an attractive attribute for any building
- At this point, suggest replacing these Rubbermaid recycling containers with blue slim jim collection containers in all printer/copy machine rooms (until a processing and collection container strategy has been established)
- Slim jim containers have more capacity to collect paper
- Slim jim containers are a larger container in the line of sight – this attribute increases recycling

DESKSIDE RECYCLING CONTAINERS

- Each desk and office area should be outfitted with a deskside recycling container
- Plan to conduct a building by building roll-out and implementation of these deskside recycling containers
- Student assistants could provide assistance in the distribution of these deskside recycling
- Clearly define what materials can go in the deskside recycling container (based on processing agreement)
- Properly label each deskside recycling container
- Clearly define who is emptying these deskside recycling containers
- If staff are supposed to empty – make sure that each building has a centralized collection area for these materials
- If Building Services or Environmental Services is supposed to empty – make sure that office staff are aware of collection procedures
- Provide appropriate education to staff members on the types of materials that can be placed in the deskside recycling container and how containers are emptied
- Ultimately, we would recommend removing the deskside trash can and replace with the deskside recycling container
- Staff move trash to centralized locations within each building
- Building Services staff remove recyclable materials from deskside recycling container once a week (staff also can move their recyclables to centralized location if becomes full before weekly collection)

UNIVERSITY OF SOUTH CAROLINA REVIEW OF 2011

INTRODUCTION

The University of South Carolina (USC) hired Resource Recycling Systems (RRS) at the end of 2010 to help bring best practices and program recommendations to the Environmental Services Department for their waste reduction, recycling services and general waste collection operation. RRS has spent significant time on campus and has prepared our analysis in a financial framework to provide solid and practically actionable recommendations for the Department to capitalize upon.

During the 2011 year, RRS conducted several site visits and met with key University departments to fully understand current waste reduction and recycling activities and programs on campus. These site visits and meetings provided a foundation from which RRS drew upon for our analysis and recommendations. This section of the comprehensive report provides an overview of our on-site work as well as our analysis on specific program components.

This section provides detailed subsections on the below topics.

- Overview of 2011 Site Visits and Meetings
- Office of Sustainability
- Environmental Services Department
- Environmental Services Department Program Metrics
- Building Walk Through Assessments
- Residence Hall Waste Sort
- Student Move-out
- Athletics Department and Events
- Food Waste Composting
- Education and Branding

December 2010 Site Visit

- Project Kick-off Meeting
- Meeting with Key Departments
  - Landscaping & Environmental Services (Facilities)
  - Office of Sustainability
  - Dining Services (Sodexo)
  - Housing Sustainability Office
  - Athletics
- Meeting with Processors
  - Waste Management Landfill
  - Sonoco Recycling Processing

January 2011 Site Visit

- Landscaping & Environmental Services Equipment Overview
- Men's Basketball Waste/Recycling Assessment
- Walk Through Waste/Recycling Assessments
  - Academic Buildings
  - Residence Halls
- Meeting with Student Groups
  - SAGE
  - Net Impact (Undergrad/Grad)
  - Residence Hall Eco-Reps
  - PEAC Conference
- Green Team Meeting

February 2011 Site Visit

- Environmental Advisory Council
- Material Movement Assessment
  - Building/Custodial Services
  - Housing Building/Custodial Services
  - Facilities Operations
- Status Updates
  - Office of Sustainability
  - Facilities Office
- Richland County Synergies

March 2011 Site Visit

- Residential Hall Waste Sorts
- Colonial Life Arena RodeoWaste/Recycling Assessment
- Explore Service Vendor Synergies
- City of Columbia Synergies
- Meeting with University Stores and Surplus
- Meeting with Facilities Budget Office
- Clean Carolina Meeting

May 2011 Site Visit

- Student Move-Out
- Clean Carolina Meeting

October 2011 Site Visit

- Football Stadium Assessment
- Tailgating Assessment

SUSTAINABILITY AT USC

Before RRS began our analysis on what direction the Environmental Services Department should take in relation to their services and operations, it was important to identify current efforts and programs on campus. The Office of Sustainability oversees campus sustainability at the University of South Carolina. The Office not only provides a mission and vision for the campus, it also provides goals, campaigns and green teams to make sustainability actionable.

OFFICE OF SUSTAINABILITY

The mission of the Office of Sustainability is "to advance the University of South Carolina's efforts to become a sustainability leader in higher education by working with administrators, faculty, staff and students to provide the knowledge, skills and motivation that will integrate sustainability values and practices into the College's strategic planning processes; the management of its resources and operations; facilities planning and design; its research activities; the curriculum; and the outside relationships of the University. As the campus leader for sustainability the Office will develop strategies to embed principals of sustainable prosperity in all the University's roles – a place of learning and research, a fiscally responsible institution, and leader of the community."

SUSTAINABLE CAROLINA

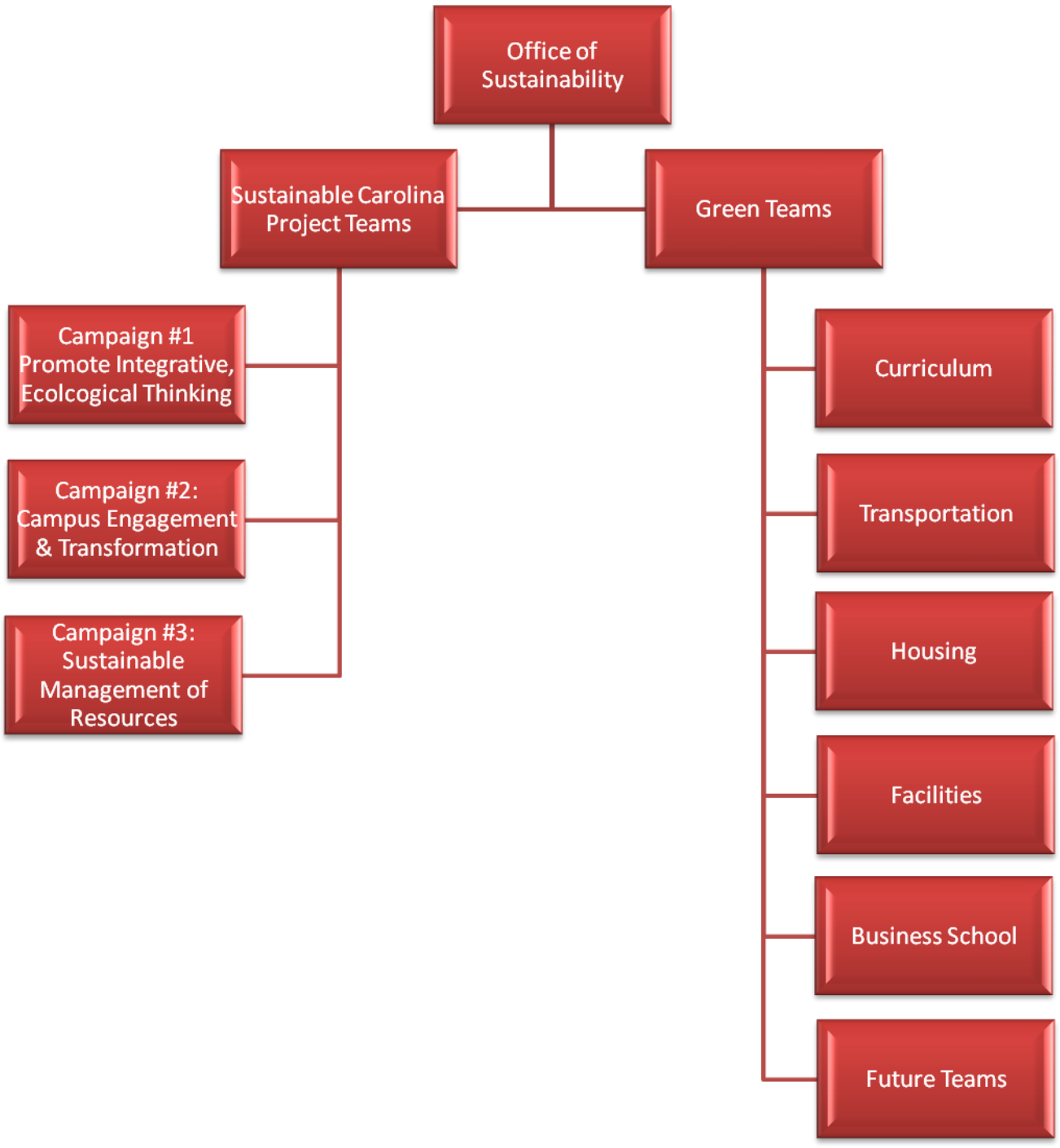
The mission of Sustainable Carolina, as part of the Office of Sustainability, is "to educate and transform the campus by promoting collaborative relationships among students, faculty, staff and community members for exploring and implementing the changes required to create a sustainable society."

The Office of Sustainability has a series of "campaigns" that they are working toward with their Sustainable Carolina Project Teams. The Office of Sustainability also works with the Green Teams developed for several campus departments including the Facilities Department. The Facilities Department Green Team is facilities-wide and includes representatives from the different areas within Facilities and a member from the Office of Sustainability.

The Facilities Department goals are broken down into three major long term goal areas including Energy and Climate, Waste Management and Water. The short term goals and strategies are executed by the Environmental Services, IT Department, Grounds, Custodial/Housekeeping, Campus Planning and General Facilities areas. The Recycling Office is responsible for addressing some of the strategies outlined in the Office of Sustainability's Campaign #3 – Promote Sustainable Management of Campus Resources. This campaign includes the following project strategy areas:

- Promote and Support Campus "Green Teams"
- Research and Action on Sustainable Food Systems
- Research and Action on Recycling/Freecycling
- Research and Action on Sustainable Energy and Transportation Systems
- Research and Action on Sustainable Land Use and Landscaping
- Research and Action on Creating a Bicycle-Friendly Campus
- Research and Action on Sustainable Building Technology

The below hierarchy displayed below is a visual representation of how the Office organizes themselves.


Office of Sustainability
Sustainable Carolina Project Teams
Green Teams
Campaign #1 Promote Integrative, Ecolcogical Thinking
Campaign #2: Campus Engagement & Transformation
Campaign #3: Sustainable Management of Resources
Curriculum
Transportation
Housing
Facilities
Business School
Future Teams

As the Office of Sustainability and their Sustainable Carolina Project Teams work to complete the goals outlined in Campaign #3, the Environmental Services Department has been tasked to partner with the Office to work on the following long and short term sustainability goals.

Long Term Goals

- Increase overall recycling rate to 40% by 2015
- Divert 75% of construction and demolition waste by 2015
- Become a zero waste campus by 2050
- Change campus culture to improve campus cleanliness and recycling
- Reduce the hours to clean classroom litter by 20% by 2012

The Environmental Services Department is working on the following list of short term strategies/goals in an effort to accomplish the above long term goals.

Short Term Goals & Strategies

	Status		
Description of Strategy	**Completed**	**In-Progress**	**Not Started**
Waste Diversion			
Divert materials from landfill by recycling, composting, reusing, donating or reselling			
Complete a campus waste audit/assessment			
Establish recycling baseline goals			
Develop tracking mechanism for all related metrics			
Develop long term waste & recycling plan			
Expand number of outdoor recycling bins on campus			
Audit and map locations of recycling bins			
Develop and expand football tailgate recycling program			
Increase recycling at athletic facilities			
Install recycling bins at Russell House			
Create “Recycle Me” message in Daily Gamecock newspaper			
Complete food waste audit			
Implement a pre-consumer food waste composting program			
Implement a post-consumer food waste composting program			
Implement a yard waste composting program			
Evaluate campus moving to single stream recycling solution			
Waste Reduction			
Establish and track a per weighted campus user metric for total waste generation based on 2005 baseline			
Waste bottle ban on campus			
Eliminate waste bottle distribution during student move-in			
Install water bottle filling stations in all new construction and renovation building projects			
Expand Dining Services reusable cup program			
Construction and Demolition Waste Diversion			
Establish a C&D recycling policy			
Track C&D volumes			

Description of Strategy	Status		
	Completed	In-Progress	Not Started
Electronic Waste Recycling Program			
Establish campus policy and program			
Establish student e-waste recycling program			
Establish battery recycling program (alkaline)			
Hazardous Waste Recycling Program			
Establish a HHW program			
Materials Exchange			
Establish a surplus department			
Establish an office supply swap program			
Limiting Printing			
Limit free printing in all computer labs and libraries			
Materials Online			
Make course catalogs, schedules and directories available online (no printing of materials)			
Chemical Reuse Inventory			
Develop campus-wide inventory system to facilitate reuse of lab chemicals			
Student Move-In Waste Reduction			
Establish move-in waste reduction/recycling program			
Student Move-Out Waste Reduction			
Establish move-out waste reduction/recycling program			
Awareness & Education			
Integrate recycling message into orientation			
Integrate recycling message into new employee training			
Conduct RecycleMania challenge			
Establish ECO Cup Challenge for residence halls and Greek Life			
Develop recycling and Clean Carolina campaigns			
Update recycling office website			

ENVIRONMENTAL SERVICES DEPARTMENT

The Environmental Services Department provides a series of "in-house" waste and recycling collection services to the University in addition to a set of services that are handled by an outside contractor. In an attempt to outline the services that Environmental Services provides, RRS has provided a discussion around each service by material type including photos of collection containers, service vehicles and material flow diagrams. RRS has also provided an estimated budget developed for each service.

WASTE COLLECTIONS

Environmental Services runs their waste collection services six days a week (Monday through Saturday) from the times of 3:30am until 11:30am. Waste materials are collected from both compactors and open top dumpsters – all roughly eight (8) cubic yards in size. Most of these compactors and open top dumpsters are located at each building loading dock. Some locations on campus do not have a collection dumpster/compactor at the buildings loading dock, so materials are transferred to a nearby collection container.

Environmental Services has two front load Mack compacting trucks used for the collection of waste materials on campus – though the front load vehicles are not used exclusively for this service. The below table provides an outline of the service on these vehicles.

Service Day	# of Trucks Used for Waste Collection
Monday	2 collection vehicles
Tuesday	1 collection vehicle
Wednesday	2 collection vehicles
Thursday	1 collection vehicle
Friday	2 collection vehicles
Saturday	1 collection vehicle (small route)
Sunday	No collection vehicles

Waste collection routes usually generate one landfill trip per daily collection route for each truck.

Environmental Services does oversee contracts with Waste Management for the transportation and disposal services of waste collected in 40 cubic yard compactors at several locations throughout campus. All waste materials are transported to the Waste Management landfill located at 1047 Highway Church Road in Elgin, South Carolina (approximately 25 miles from campus). Waste Management charges $29.01 per ton to dispose of these waste materials in their landfill. In fiscal year 2009-2010, a total of 4,223 tons of waste was collected from both Environmental Services front load collection vehicles and locations with 40 cubic yard waste compactors serviced by Waste Management.

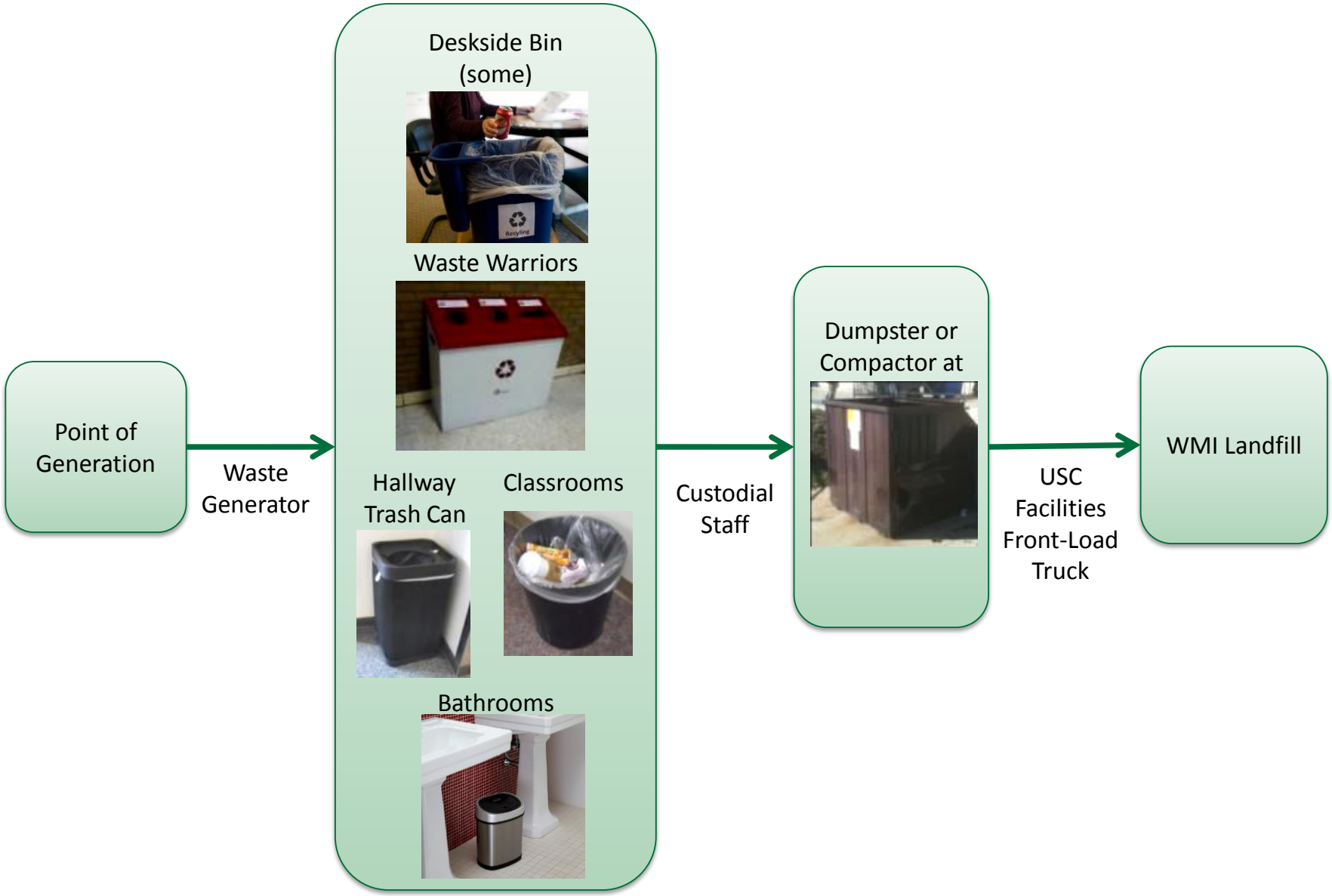
The below table provides an estimated budget and performance metrics on this waste collection service.

Estimated Budget and Performance Metrics – Front Load Waste Dumpster Collection Routes

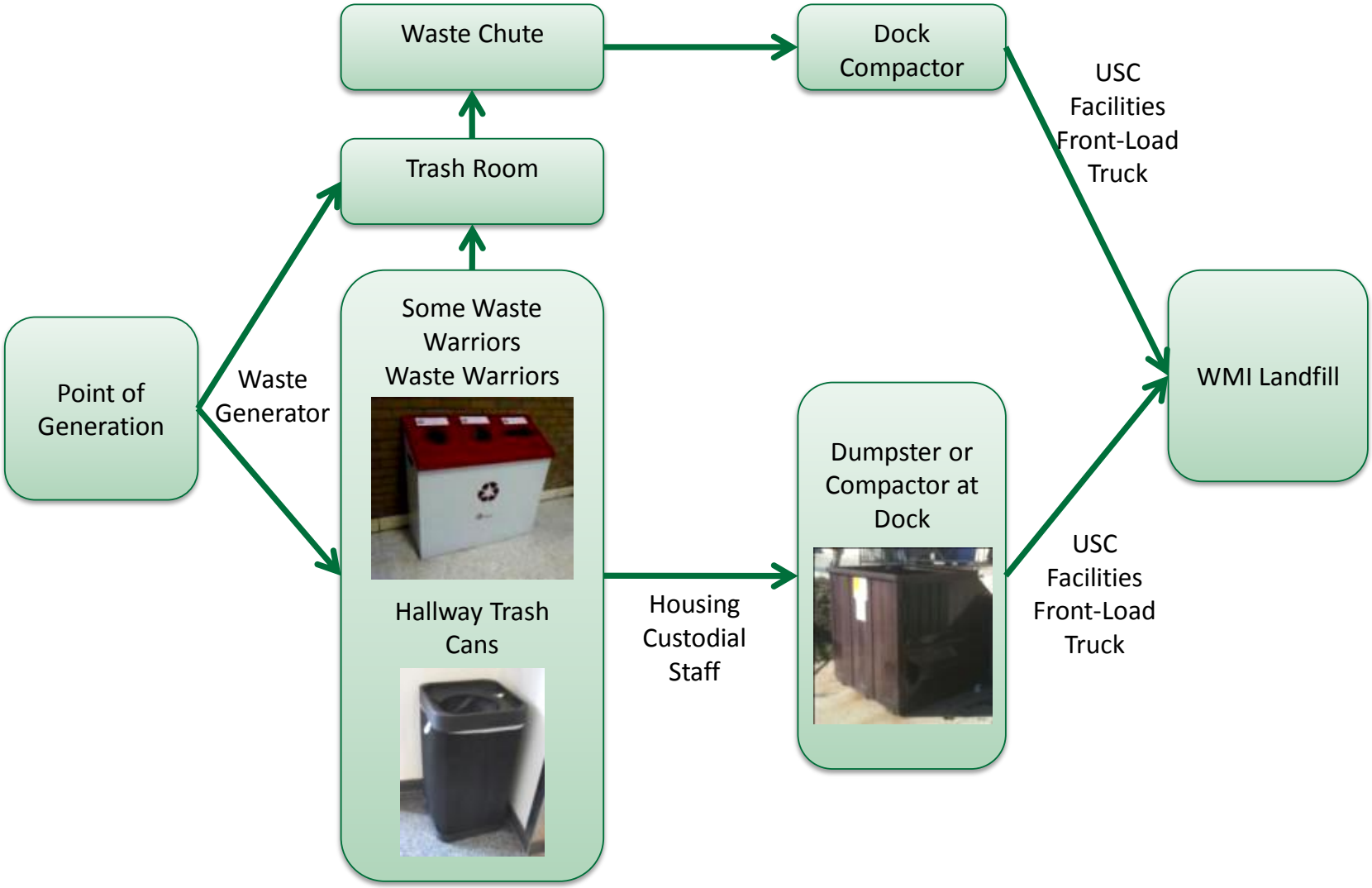
Item	Cost	Notes
Labor		
Driver	$43,573.20	Assumes 1.6 FTE @ $13.62/hr
Fringes	$11,978.27	Assumed to be 27% of wages, based on budget data from USC
Capital		
Front Load Truck	$44,359.36	Assumes 160% usage of front load truck purchased for $179,190 and capitalized at 5% interest over 8 years
Insurance	$14,400.00	Assumes 160% share of $9,000 annual insurance
Maintenance/Tires	$30,400.00	Assumes 160% share of $19,000 annual maintenance and tires
Fuel/Fluids	$9,600.00	Assumes 160% share of $6,000 annual fuel and fluids
Admin		Not included at this time
Total	**$154,310.84**	
Stops/Week	482	From Gamecock Trash Company route sheet
Tons (FY 08-09)	4223	Total for last complete year in Waste Stream Data 2004 to Present spreadsheet
Cost/Pickup	$6.16	Calculated from above
Cost/Ton	$36.54	Calculated from above
Waste Disposal ($/Ton)	$29.01	Estimate from discussions with USC staff
Revenue ($/Ton)		n/a
Net Cost per Pickup	$11.04	Calculated from above
Net Cost per Ton	$65.55	Calculated from above

As RRS has talked with Environmental Services, Custodial Services and Housing Custodial Services, the following material flow diagrams have been produced to show how waste materials generated both within academic and residence hall buildings move through the University to their final disposal destination. Environmental Services staff only deal with waste materials on the exterior of the building as both the Custodial and Housing Custodial Services staff move waste materials from the interior of the building to the exterior dumpsters and compactors.

SOLID WASTE – ACADEMIC BUILDINGS



SOLID WASTE – RESIDENCE HALLS



CARDBOARD RECYCLING COLLECTIONS

Environmental Services runs their cardboard recycling collection services once a week on Tuesdays from the times of 3:30am until 11:30am. Environmental Services uses one front load Mack compacting truck for the collection of this material. Cardboard recycling materials are collected within the buildings and taken to an eight (8) cubic dumpster either at the building loading dock or to a nearby collection dumpster. These dumpsters have a slotted opening where only broken down cardboard can be placed. Because of these opening, contamination is minimal in these dumpsters.

Additionally, several locations on campus have a vertical baler for their cardboard. At these locations (see table below), cardboard is placed into the baler by the building's staff person and after a small half bale is produced, the bale is dumped out of the baler and placed on a wood pallet. These bales are set at the loading dock where Environmental Services uses a specialized front load dumpster hauling truck to transport these bales to the Environmental Services waste pad. These bales are stacked at the waste pad until a full semi-truck load is generated. At this time, Pratt Industries picks up this truck load of cardboard bales for processing at their facility.

Most of the locations are on an "on-call" system for cardboard bale pick-up. The Russell House generates roughly one bale per day. Overall Environmental Services estimates that they collect eight to nine bales of cardboard each week.

Location of Cardboard Balers
Honors College Residence Hall
Colonial Life Arena
Russell House
University Coliseum
Bates Café
National Advocacy Center
Capstone Residence Hall
Green Village

Unfortunately, because the number of cardboard collection dumpsters is limited on campus, it is thought that a large amount of cardboard is being placed in waste dumpsters and compactors and therefore is not recycled. Originally cardboard dumpsters were placed in locations that didn't have space constraints and in locations that were thought to generate cardboard.

Cardboard recycling collection routes usually generate one trip each week to the Pratt Industries transfer facility.

In fiscal year 2009-2010, 145 tons of cardboard was estimated to be collected with the Environmental Service's front load collection vehicles. All cardboard materials (both loose and baled) are transported to the Pratt Industries transfer facility located in the greater Columbia, South Carolina area. As part of the originally negotiated revenue share agreement with Pratt Industries, a revenue share of $144 per ton would be given to Environmental Services for both their loose and baled cardboard.

The below table provides an estimated budget and performance metrics on both the dumpster and baled cardboard collection service.

Estimated Budget and Performance Metrics – Front Load Cardboard Dumpster Collection Routes

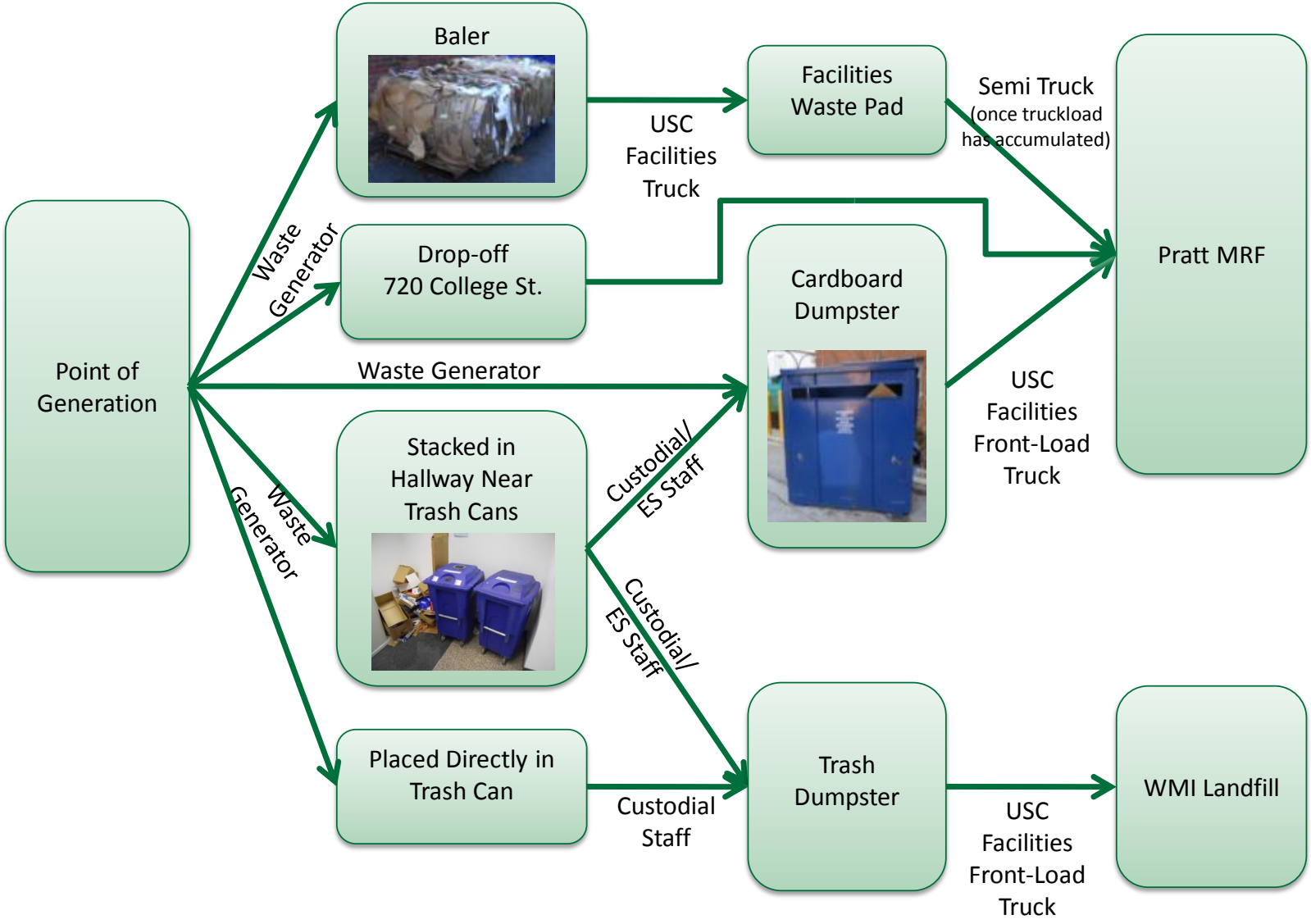
Item	Cost	Notes
Labor		
Driver	$5,446.65	Assumes 0.2 FTE @ $13.62/hr
Fringes	$1,497.28	Assumed to be 27% of wages, based on budget data from USC
Capital		
Front Load Truck	$5,544.92	Assumes 20% usage of front load truck purchased for $179,190 and capitalized at 5% interest over 8 years
Insurance	$1,800.00	Assumes 20% share of $9,000 annual insurance
Maintenance/Tires	$3,800.00	Assumes 20% share of $19,000 annual maintenance and tires
Fuel/Fluids	$1,200.00	Assumes 20% share of $6,000 annual fuel and fluids
Admin		Not included at this time
Total	**$19,288.85**	
Stops/Week	56	From Gamecock Trash Company route sheet
Tons (FY 09-10)	145	Average of "Corrugated Cardboard" item from Monthly Recycling Data spreadsheet
Cost/Pickup	$6.62	Calculated from above
Cost/Ton	$133.07	Calculated from above
Waste Disposal ($/Ton)		
Revenue ($/Ton)	$100.00	Estimated
Net Cost per Pickup	$1.65	Calculated from above
Net Cost per Ton	$33.07	Calculated from above

Estimated Budget and Performance Metrics –Cardboard Bale Collection Routes

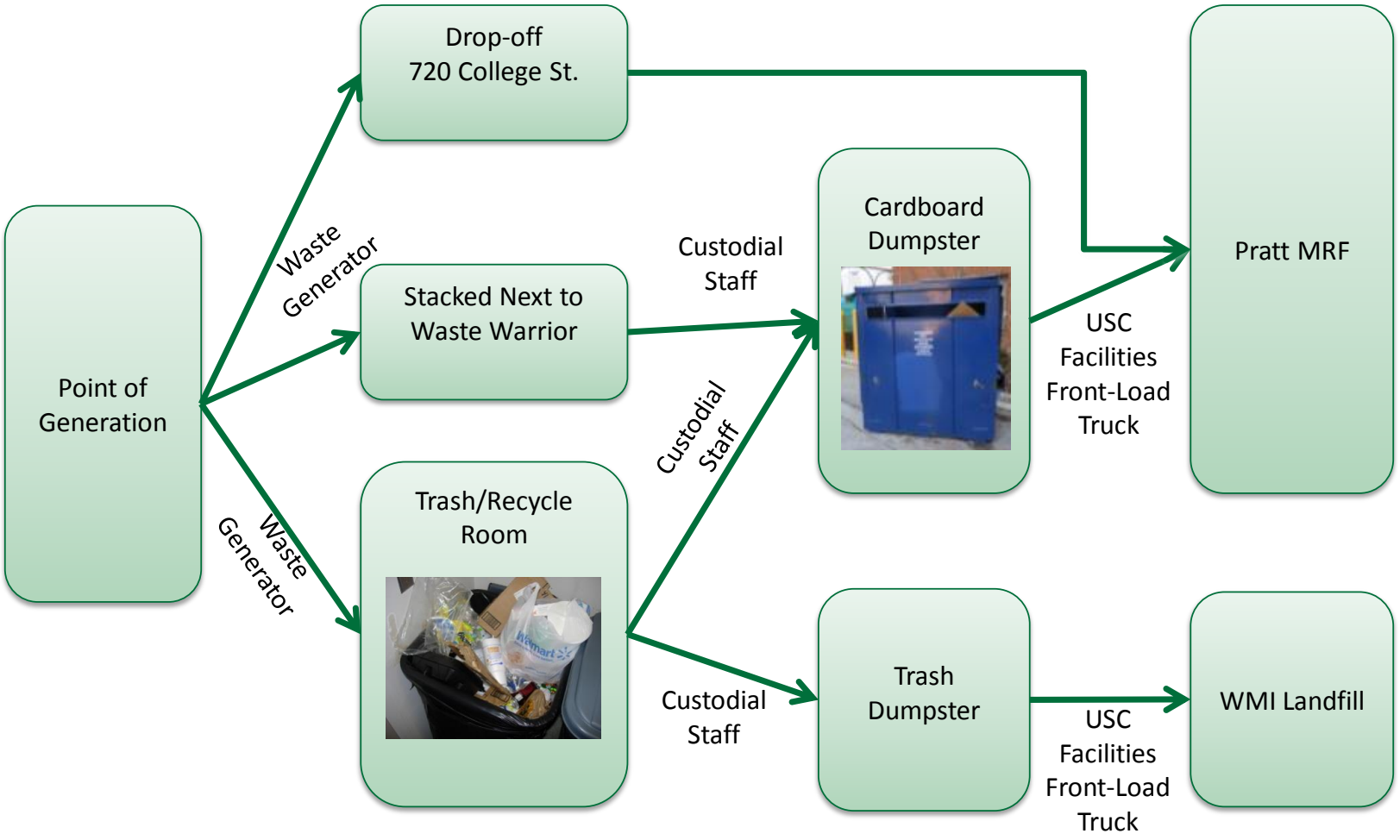
Program	Cost	Notes
Labor		
Driver	$5,446.65	Assumes 0.2 FTE @ $13.62/hr
Fringes	$1,497.28	Assumed to be 27% of wages, based on budget data from USC
Capital		
Dumpster Hauling Truck	$716.89	Assumes 20% usage of dumpster hauling truck purchased for $23,167 and capitalized at 5% interest over 8 years
Insurance	$800.00	Assumes 20% share of $4,000 annual insurance
Maintenance/Tires	$1,800.00	Assumes 20% share of $9,000 annual maintenance and tires
Fuel/Fluids	$800.00	Assumes 20% share of $4,000 annual fuel and fluids
Admin		Not included at this time
Total	**$11,060.82**	
Stops/Week	8	Estimated
Tons (FY 09-10)	58	Average of "Corrugated Cardboard - Baled" item from Monthly Recycling Data spreadsheet
Cost/Pickup	$26.59	Calculated from above
Cost/Ton	$191.21	Calculated from above
Waste Disposal ($/Ton)		
Revenue ($/Ton)	$105.00	Estimated
Net Cost per Pickup	$11.99	Calculated from above
Net Cost per Ton	$86.21	Calculated from above

As RRS has talked with Environmental Services, Custodial Services and Housing Custodial Services, the following material flow diagrams have been produced to show how waste materials generated both within academic and residence hall buildings move through the University to their final disposal destination. For the most part, Environmental Services staff only deal with cardboard materials on the exterior of the building as both the Custodial and Housing Custodial Services staff move cardboard materials from the interior of the building to the exterior recycling dumpsters. With that being said, there are several locations and buildings on campus where Environmental Services staff do transport cardboard to the exterior of the building for either baling or to be placed in the cardboard recycling dumpster.

CARDBOARD – ACADEMIC BUILDINGS

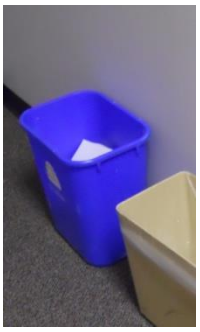


CARDBOARD – RESIDENCE HALLS



OFFICE PAPER RECYCLING COLLECTIONS

Environmental Services runs their office paper recycling collection services once a week on Thursdays from the times of 3:30am until 11:30am. Environmental Services uses one front load Mack compacting truck (with an FEL Carry Can attachment) for the collection of this material. Office paper recycling materials are collected within the buildings through a variety of collection containers including at desk bins, waste warrior multi-sort units, Rubbermaid containers, slim jim containers and rolling carts.





All materials are transferred to the rolling carts during the week by building staff, Custodial Staff and Environmental Services staff throughout the week. Building staff are supposed to empty their desk-side collection bin into a centralized location for recycling. Environmental Services staff have a Monday through Friday collection route which includes the routed collection from the waste warrior multi-sort units, Rubbermaid containers, slim jim containers and rolling carts. The Custodial Staff also do some emptying of centralized collection containers as well as desk-side bins into the rolling carts. On Wednesdays, Environmental Services staff pulls the rolling carts that are at least 50% full of office paper out of the buildings and place at the street curb. On Thursdays, Environmental Services empty these rolling carts of office paper via the front load compacting truck with a FEL carry can attachment – empty carts are placed at the street curb. Environmental Services staff then returns these rolling carts within the buildings.

If a building has a full rolling cart before the schedule collection on Wednesday/Thursday, a service request is placed into the Environmental Services' call center.

Office paper recycling collection routes usually generate one trip each week to the Pratt Industries transfer facility.

In the residence halls, office paper is collected as a mixed paper stream. These materials are pulled from the waste/recycling rooms within each residence hall on Fridays. The bagged materials are set at the loading dock for collection by either Environmental Services or by Housing's Move Crew. Materials are transferred either directly to Pratt Industries transfer facility or to the Environmental Services waste pad.

In fiscal year 2009-2010, 132 tons of office paper was collected with the Environmental Services front load collection vehicles. All office paper materials are transported to the Pratt Industries transfer facility located in the greater Columbia, South Carolina area. As part of the originally negotiated revenue share agreement with Pratt Industries, a revenue share of $190 per ton would be given to Environmental Services for their office paper.

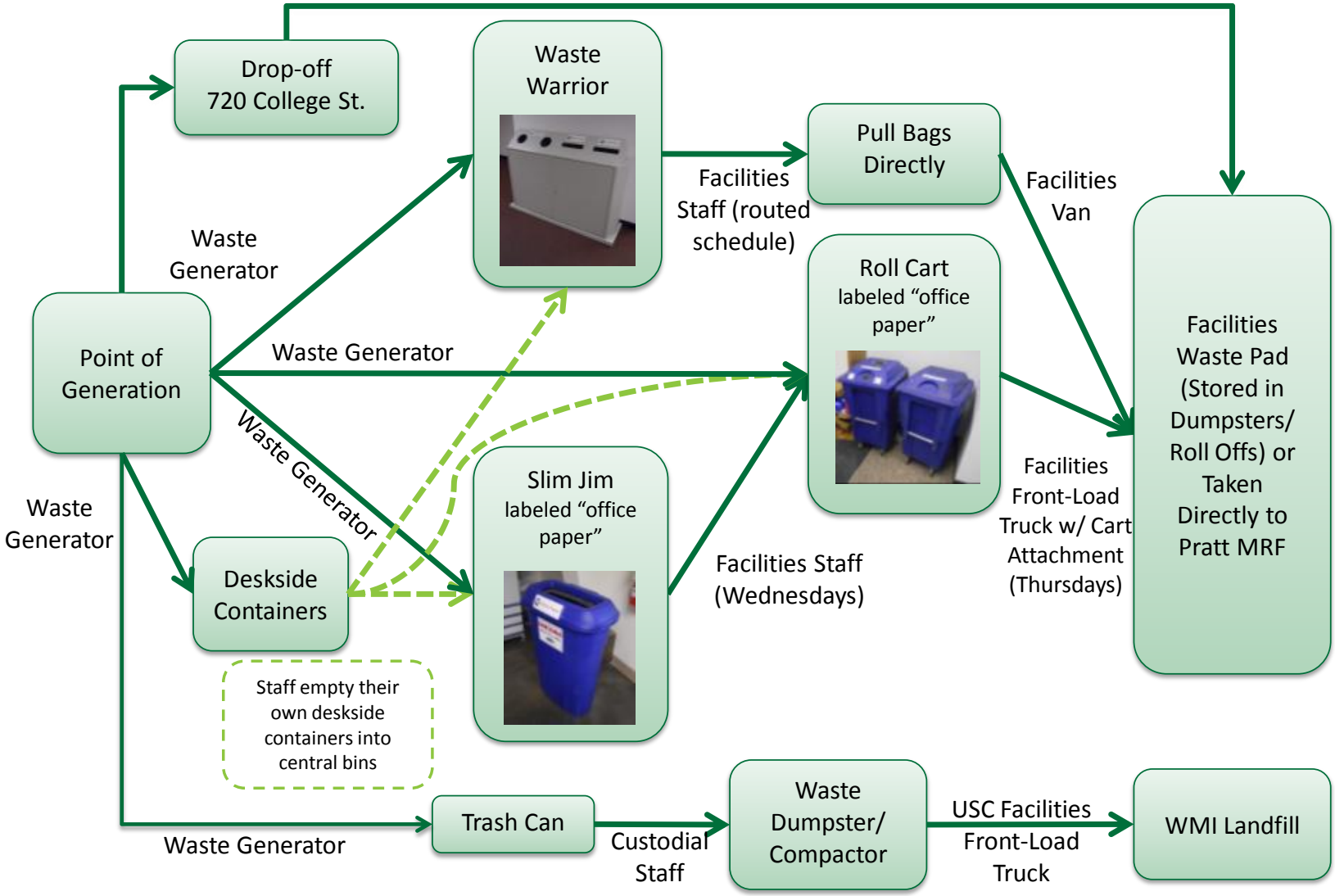
The below table provides an estimated budget and performance metrics on this office paper collection service.

Estimated Budget and Performance Metrics – Office Paper Collection Routes

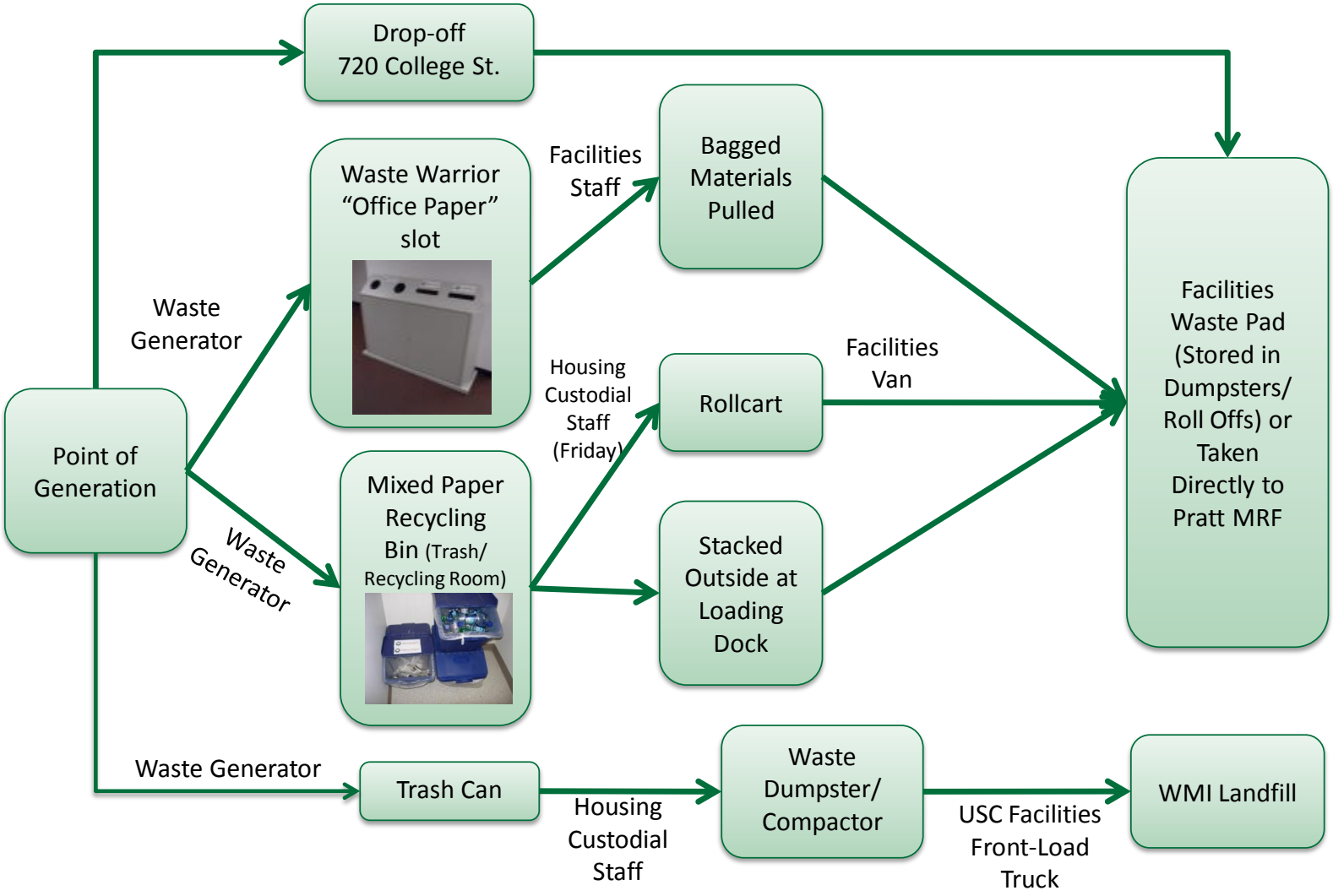
Item	Cost	Notes
Labor		
Driver	$5,446.65	Assumes 0.2 FTE @ $13.62/hr
Laborer	$3,652.70	Assumes 0.2 FTE @ $9.13/hr
Fringes	$2,501.41	Assumed to be 27% of wages, based on budget data from USC
Capital		
Front Load Truck	$5,544.92	Assumes 20% usage of front load truck purchased for $179,190 and capitalized at 5% interest over 8 years
Cart Attachment for Front Load Truck	$3,403.88	Assumes 20% usage of cart attachment purchased for $22,000 and capitalized at 5% interest over 8 years
Insurance	$1,800.00	Assumes 20% share of $9,000 annual insurance
Maintenance/Tires	$3,800.00	Assumes 20% share of $19,000 annual maintenance and tires
Fuel/Fluids	$1,200.00	Assumes 20% share of $6,000 annual fuel and fluids
Admin		Not included at this time
Total	**$27,349.56**	
Stops/Week	85	From Gamecock Trash Company route sheet
Tons (FY 09-10)	132	Average from Monthly Recycling Data spreadsheet, including recyclables categorized as color ledger and office paper
Cost/Pickup	$6.19	Calculated from above
Cost/Ton	$206.97	Calculated from above
Waste Disposal ($/Ton)		
Revenue ($/Ton)	$180.00	Estimated
Net Cost per Pickup	$0.81	Calculated from above
Net Cost per Ton	$26.97	Calculated from above

As RRS has talked with Environmental Services, Custodial Services and Housing Custodial Services, the following material flow diagrams have been produced to show how waste materials generated both within academic and residence hall buildings move through the University to their final disposal destination.

OFFICE PAPER – ACADEMIC BUILDINGS



OFFICE PAPER – RESIDENCE HALLS



COMMINGLED BOTTLES/CANS, NEWSPAPER AND MIXED PAPER RECYCLING COLLECTIONS

Environmental Services runs their commingled bottles/cans, newspaper and mixed paper recycling collection services five days a week (Monday through Friday) from the times of 7:30am until 3:30pm. Environmental Services uses two passenger vans for the collection of this bagged material which is collected on a north, south and west route daily. These materials are collected within the buildings through a variety of collection containers including at desk bins, waste warrior multi-sort units, Rubbermaid containers, slim jim containers and rolling carts.

Environmental Services staff have a Monday through Friday collection route which includes the routed collection from the waste warrior multi-sort units, Rubbermaid containers, slim jim containers and rolling carts. Building staff are supposed to empty their desk-side collection bin into a centralized location for recycling. Materials are collected in bags and are transferred to the passenger van for transportation to the Environmental Services waste pad.

After commingled bottles/cans, newspapers and mixed paper materials are transported to the Environmental Services waste pad, they are stored in dumpsters and/or roll-offs until a large enough volume is generated for transfer to the Pratt Industries transfer facility.

In the residence halls, these materials are pulled from the waste/recycling rooms within each residence hall on Fridays. The bagged materials are set at the loading dock for collection by either Environmental Services or by Housing's Move Crew. Materials are transferred either directly to Pratt Industries transfer facility or to the Environmental Services waste pad.

At Russell House, Sodexo is responsible for emptying commingled bottles/cans from the waste warriors and transferring materials to the roll carts at the loading dock. Environmental Services staff then pick up these materials from the dock during the scheduled collection time.

In fiscal year 2009-2010, 75 tons of commingled bottles/cans, newspapers and mixed paper materials were collected with the Environmental Services passenger vans. These materials were transported to the Pratt Industries transfer facility located in the greater Columbia, South Carolina area. As part of the originally negotiated revenue share agreement with Pratt Industries, a revenue share of $93.50 per ton would be given to Environmental Services for their #8 news materials and $89.25 per ton for mixed paper. Pratt did not give a revenue share for the commingled bottles and cans.

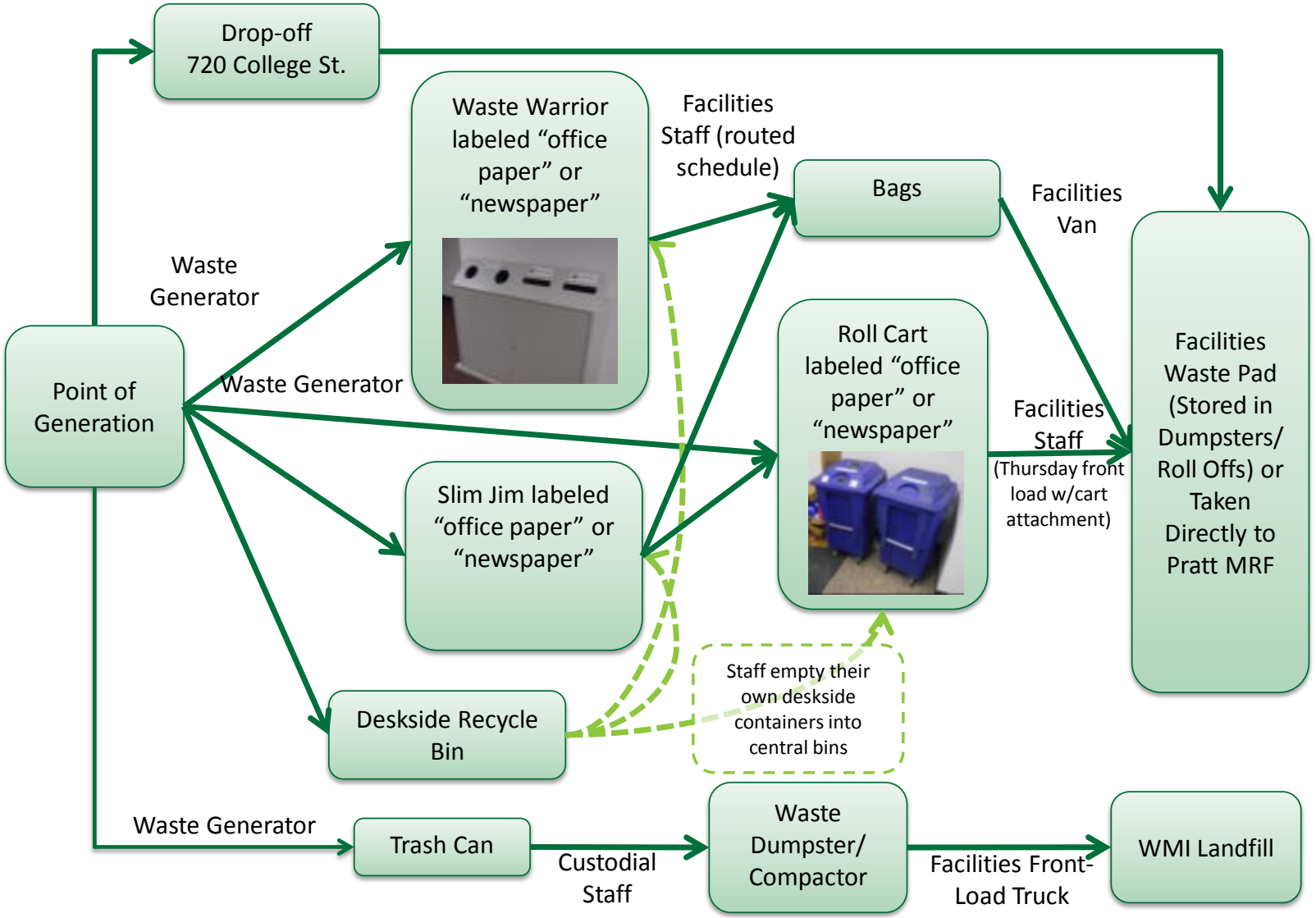
The below table provides an estimated budget and performance metrics on this commingled bottles/cans, newspapers and mixed paper collection service.

Estimated Budget and Performance Metrics – Commingled Bottles/Cans, Newspaper and Mixed Paper Collection Routes

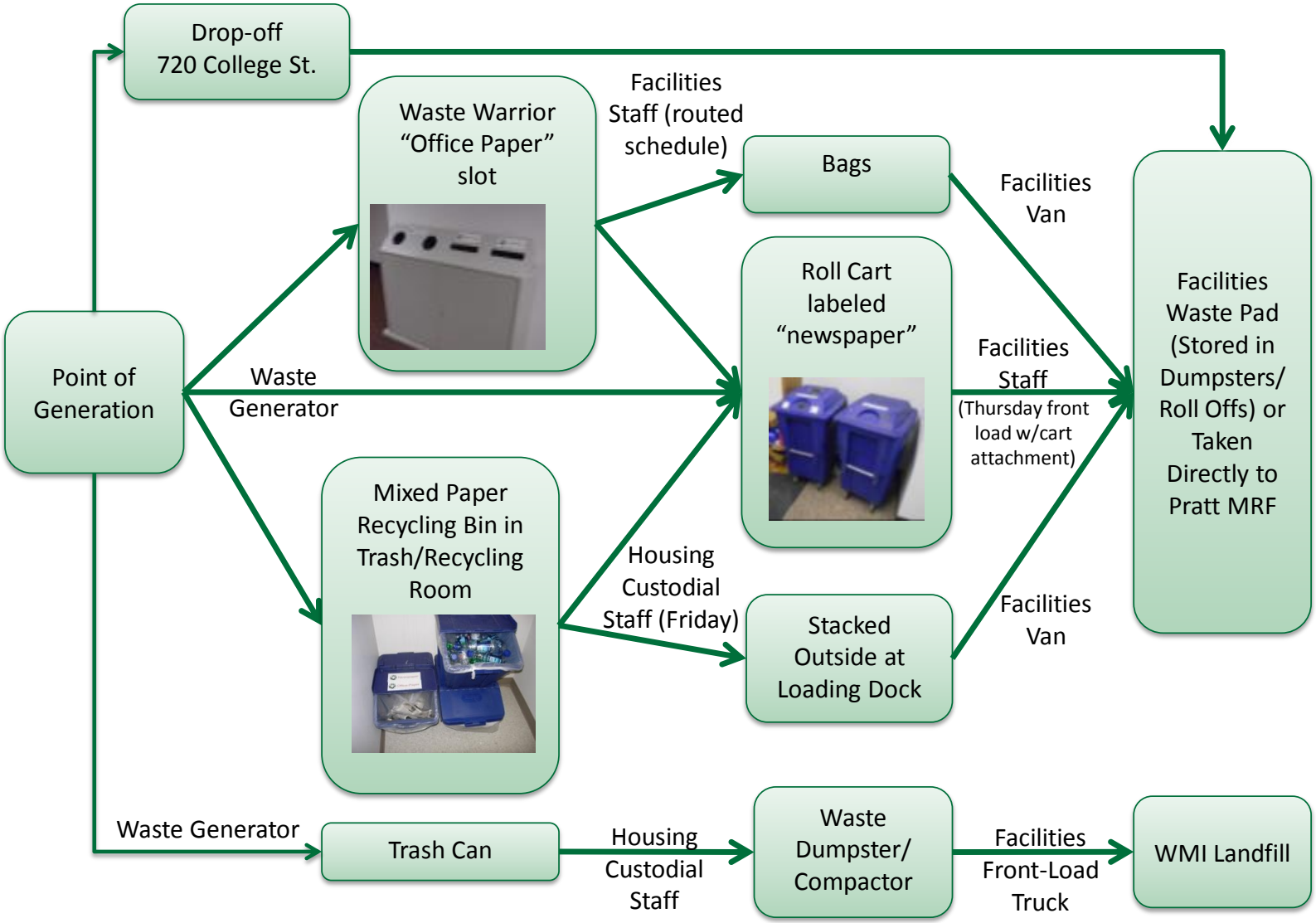
Item	Cost	Notes
Labor		
Driver	$46,296.53	Assumes 2 FTE @ $13.62/hr
Laborer	$31,047.95	Assumes 2 FTE @ $9.13/hr
Fringes	$21,262.00	Assumed to be 27% of wages, based on budget data from USC
Capital		
Cargo Van	$2,800.46	Assumes full use of cargo van purchased for $18,100 and capitalized at 5% interest over 8 years
Bread Truck	$3,955.46	Assumes full use of bread truck purchased for $25,565 and capitalized at 5% interest over 8 years
Insurance	$8,000.00	Assumes 2 full time shares of $4,000 annual insurance
Maintenance/Tires	$18,000.00	Assumes 2 full time shares of $9,000 annual maintenance and tires
Fuel/Fluids	$8,000.00	Assumes 2 full time shares of $4,000 annual fuel and fluids
Admin	$0.00	Not included at this time
Total	**$139,362.40**	
Stops/Week	244	From Gamecock Trash Company route sheet
Tons (FY 09-10)	75	Average from Monthly Recycling Data spreadsheet, including recyclables categorized as plastic, metals, glass, commingled MRF, mixed paper, telephone books, office waste, and newspaper.
Cost/Pickup	$10.98	Calculated from above
Cost/Ton	$1,865.63	Calculated from above – note that this route includes in-building collection, unlike other materials that are collected in dumpsters, compactors, or carts.
Waste Disposal ($/Ton)		
Revenue ($/Ton)	$40.00	Estimated
Net Cost per Pickup	$10.75	Calculated from above
Net Cost per Ton	$1,825.63	Calculated from above

As RRS has talked with Environmental Services, Custodial Services and Housing Custodial Services, the following material flow diagrams have been produced to show how waste materials generated both within academic and residence hall buildings move through the University to their final disposal destination.

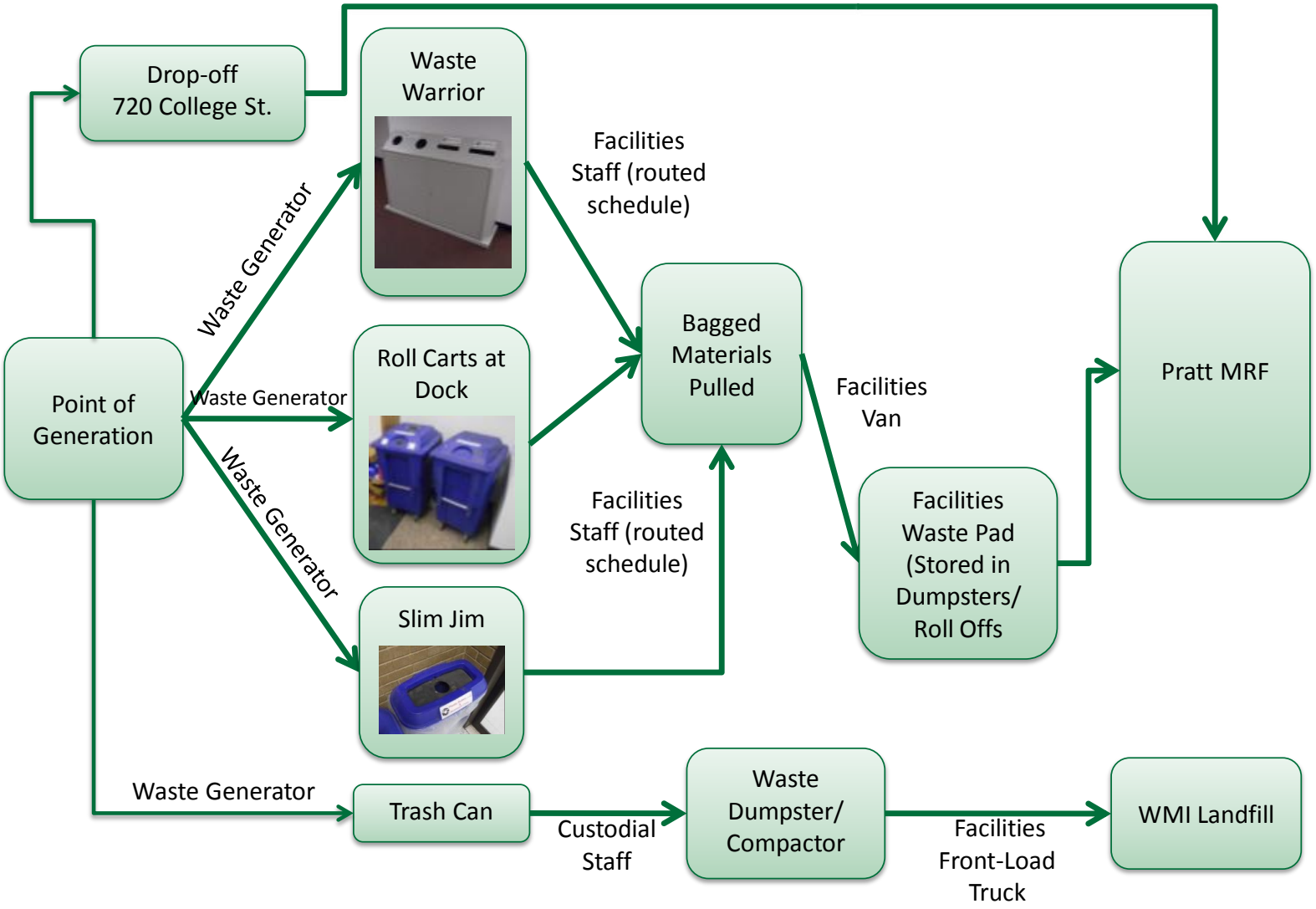
NEWSPAPER/MIXED PAPER – ACADEMIC BUILDINGS



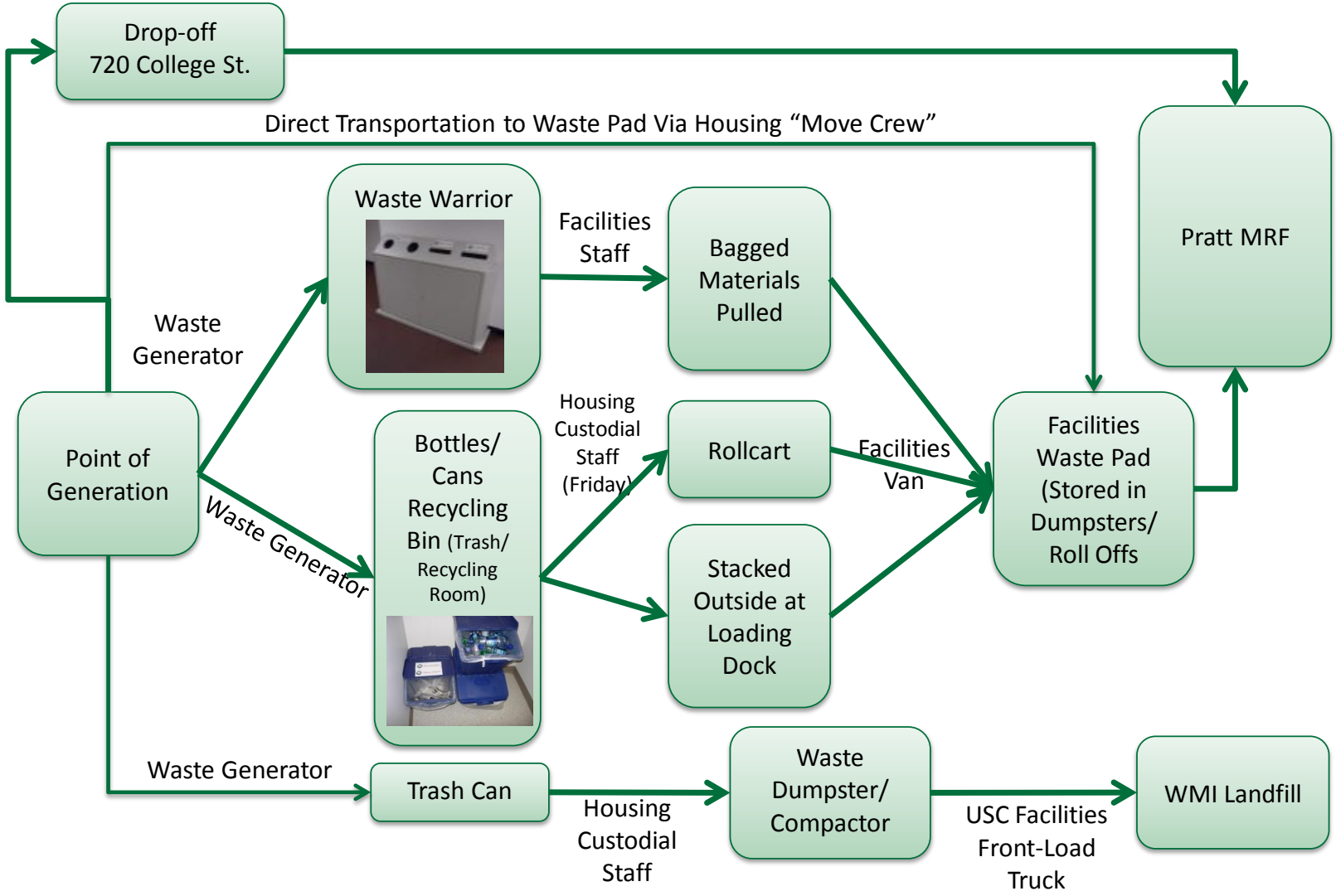
NEWSPAPER/MIXED PAPER – RESIDENCE HALLS



BOTTLES AND CANS – ACADEMIC BUILDINGS



BOTTLES AND CANS – RESIDENCE HALLS



SCRAP WOOD/PALLET RECYCLING COLLECTIONS

Environmental Services runs their scrap wood/pallet recycling collection services on a weekly route and on a "on-call" basis from the times of 7:30am until 3:30pm. Environmental Services uses a pick-up truck for the collection of these materials. Scrap wood/pallets are transported to a building loading dock from either the interior of a building or through the unpacking of materials at the loading dock. The scrap wood/pallets are delivered to the Environmental Services waste pad where they are stacked until approximately 20 stacks (19 pallets in each stack) are generated. At this time a pallet vendor comes to the waste pad to collect the pallets for recycling.

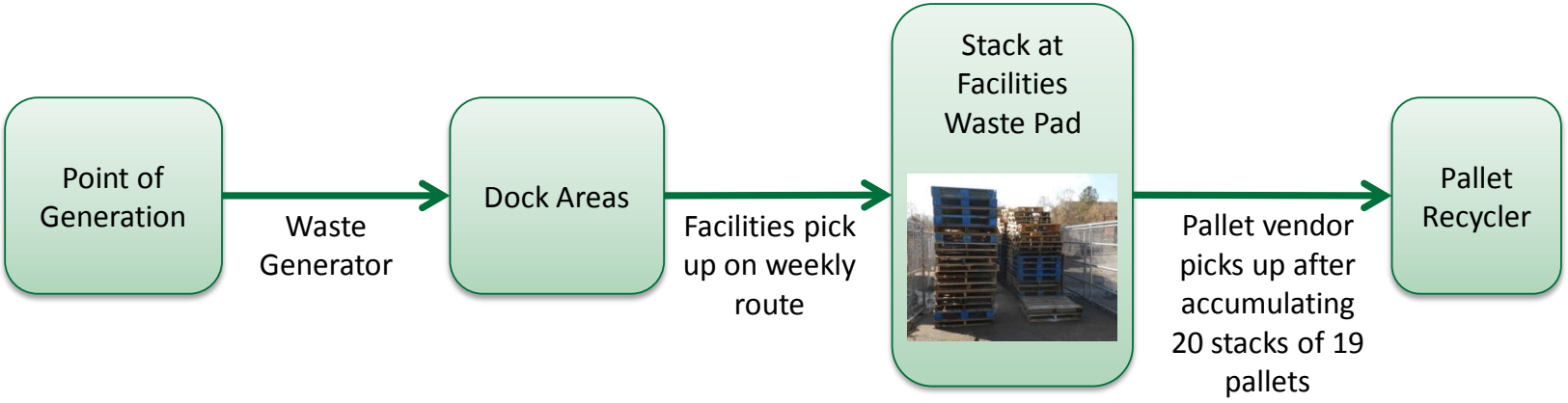
In fiscal year 2009-2010, 53.72 tons of scrap wood/pallets were collected. The below table provides an estimated budget and performance metrics on this scrap wood/pallet collection service.

Estimated Budget and Performance Metrics – Scrap Wood/Pallet Collection Routes

Item	Cost	Notes
Labor		
Driver	$5,446.65	Assumes 0.2 FTE @ 13.62/hr
Fringes	$1,497.28	Assumed to be 27% of wages, based on budget data from USC
Capital		
Pickup	$495.70	Assumes 20% usage of pickup purchased for $16,019 and capitalized at 5% interest over 8 years
Insurance	$800.00	Assumes 20% share of $4,000 annual insurance
Maintenance/Tires	$1,800.00	Assumes 20% share of $9,000 annual maintenance and tires
Fuel/Fluids	$800.00	Assumes 20% share of $4,000 annual fuel and fluids
Admin	$0.00	Not included at this time
Total	**$10,839.63**	
Stops/Week	21	From Gamecock Trash Company route sheet
Tons (FY 09-10)	54	Data provided by Environmental Services
Cost/Pickup	$9.93	Calculated from above
Cost/Ton	$200.73	Calculated from above
Waste Disposal ($/Ton)		
Revenue ($/Ton)	$0.00	Assumed to be no cost/no revenue to dispose
Net Cost per Pickup	$9.93	Calculated from above
Net Cost per Ton	$200.73	Calculated from above

As RRS has talked with Environmental Services the following material flow diagrams have been produced to show how waste materials generated both within academic buildings move through the University to their final disposal destination.

SCRAP WOOD PALLETS



GLASS RECYCLING COLLECTIONS

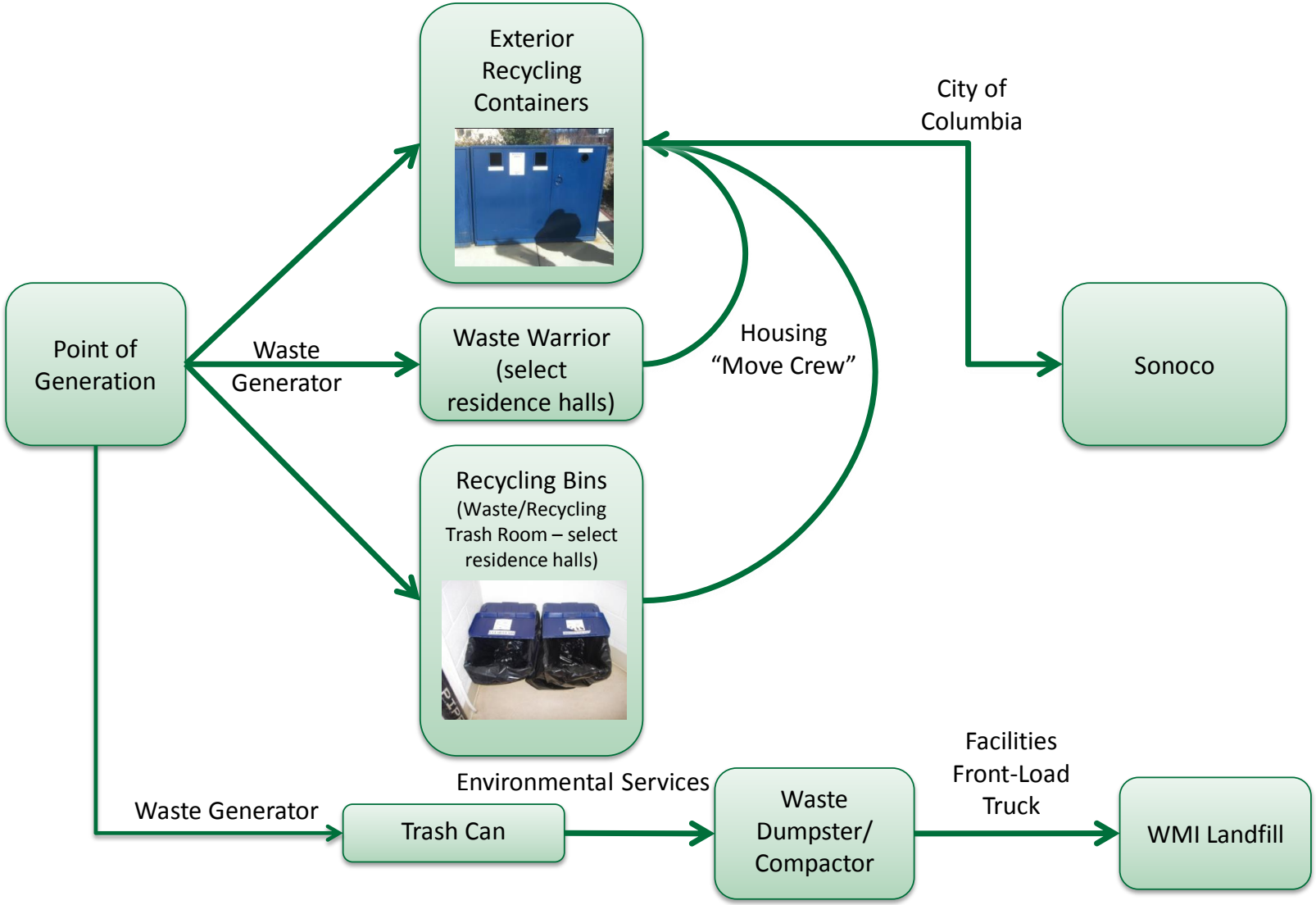
The City of Columbia collects glass recycling on campus every Friday, free of charge for the University. Glass materials are transported from locations across campus to one of three glass collection areas on campus. The glass is sorted into clear, green and amber colors.

Glass recycling also occurs at a select number of residence halls. Housing Move Crew staff transport this material to one of the three glass collection areas on campus.

All glass collected on campus is mixed into the City's glass collection route and is transported to Sonoco for recycling.

As RRS has talked with Environmental Services, the following material flow diagrams have been produced to show how waste materials generated both within academic buildings move through the University to their final disposal destination.

GLASS – ACADEMIC BUILDINGS AND RESIDENCE HALLS



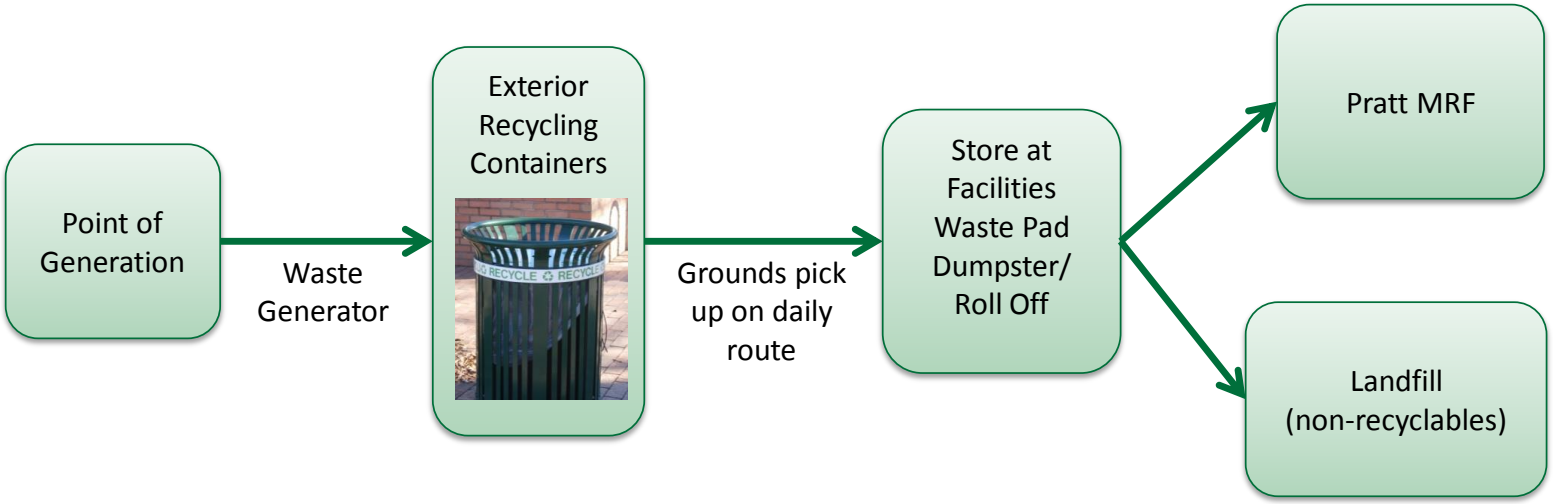
EXTERIOR RECYCLING COLLECTIONS

The Grounds Department collects commingled bottles and cans recycling on a daily basis from the times of 7:30am until 3:30pm. There are approximately 20-30 exterior recycling collection containers located mainly around the Russell House, library and other high traffic student areas. The Grounds Department uses a pick-up truck for the collection of these materials. Materials are transported back to the Environmental Services waste pad where they are placed into a roll-off container for later transport to Pratt Industries.

Unfortunately because these containers look much like the exterior trash cans, these containers get heavily contaminated with trash.

As RRS has talked with Environmental Services the following material flow diagrams have been produced to show how waste materials generated both within academic buildings move through the University to their final disposal destination.

EXTERIOR RECYCLING CONTAINERS

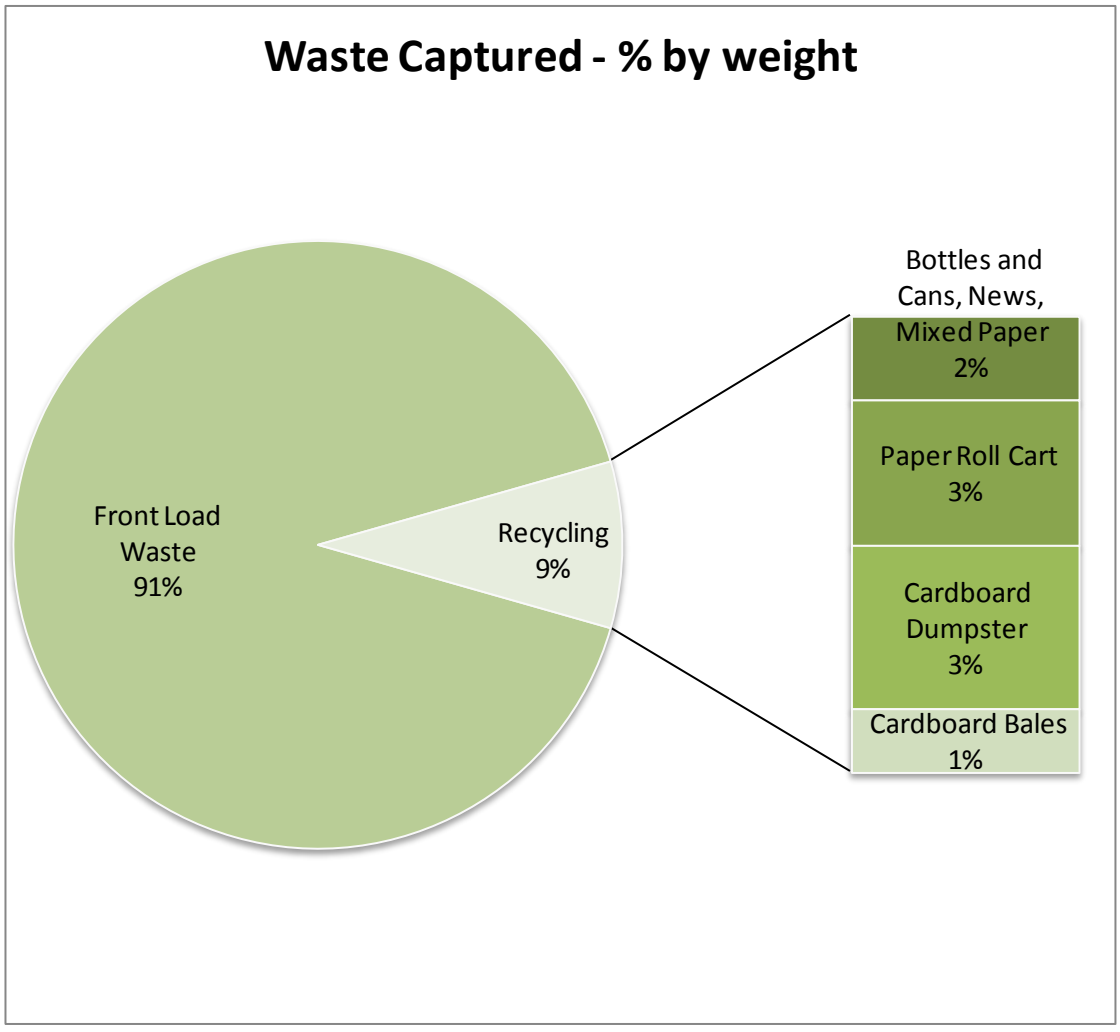


ENVIRONMENTAL SERVICES DEPARTMENT PROGRAM METRICS

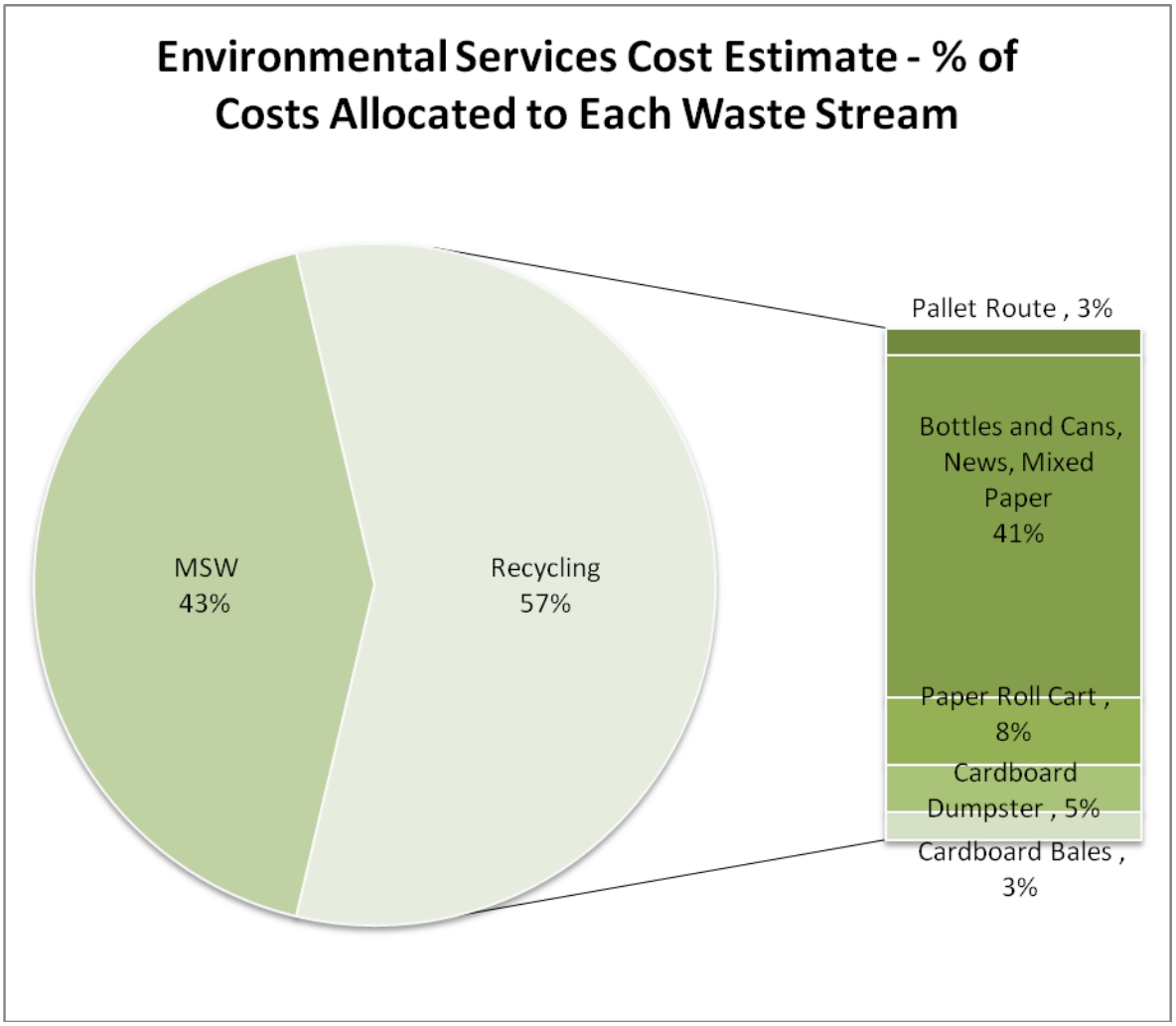
Overall Estimated Budget and Performance Metrics – All Collection Programs

Program	Pallet Route	Recycling - Total	Paper Roll Cart	Cardboard Dumpster	MSW	Cardboard Bales	Total	Notes
Revenue								
Customer Billings							378,082.00	Total of FY 2010 monthly billings
Sale of Recyclables							0.00	Calculated from values below
Total Revenue							378,082.00	
Expenses								
Labor								
Driver	$5,446.65	$46,296.53	$5,446.65	$5,446.65	$43,573.20	$5,446.65	$111,656.33	4.1 FTE; Estimate from notes
Laborer	$0.00	$31,047.95	$3,652.70	$0.00	$0.00	$0.00	$34,700.65	1.9 FTE; Estimate from notes
Total Labor	$5,446.65	$77,344.48	$9,099.35	$5,446.65	$43,573.20	$5,446.65	$146,356.98	
Fringes	$1,497.28	$21,262.00	$2,501.41	$1,497.28	$11,978.27	$1,497.28	$40,233.53	Calculated from budgets given
Capital								
Cargo Van (2008 Ford E-350)	$0.00	$2,800.46	$0.00	$0.00	$0.00	$0.00	$2,800.46	% allocation is estimated from notes. Costs are calculated from amounts given by USC with 5% interest over 8 year period
Bread Truck (1995 Chevrolet Step Van)	$0.00	$3,955.46	$0.00	$0.00	$0.00	$0.00	$3,955.46	
Dumpster Hauling Truck (2006 Ford F350SD)	$0.00	$0.00	$0.00	$0.00	$0.00	$716.89	$716.89	
Front Load Truck (2004 Mack Garbage Truck)	$0.00	$0.00	$5,544.92	$5,544.92	$44,359.36	$0.00	$55,449.20	
Cart Attachment for Front Load Truck	$0.00	$0.00	$3,403.88	$0.00	$0.00	$0.00	$3,403.88	
Pickup (2008 Ford F-250)	$495.70	$0.00	$0.00	$0.00	$0.00	$0.00	$495.70	
Total Capital	$495.70	$6,755.93	$8,948.80	$5,544.92	$44,359.36	$716.89	$66,821.60	
O&M								
Insurance	$800.00	$8,000.00	$1,800.00	$1,800.00	$14,400.00	$800.00	$27,600.00	
Maintenance/Tires	$1,800.00	$18,000.00	$3,800.00	$3,800.00	$30,400.00	$1,800.00	$59,600.00	
Fuel/Fluids	$800.00	$8,000.00	$1,200.00	$1,200.00	$9,600.00	$800.00	$21,600.00	
Trash Disposal							$122,503.72	Calculated from values below
Admin								
Program Coord I							$37,655.00	from email
Build/Grounds Supv I							$33,113.00	from email
Fringes for Admin staff							$19,454.12	calculated from budgets given
Collection Labor Subtotal	$6,943.93	$98,606.47	$11,600.76	$6,943.93	$55,551.47	$6,943.93	$186,590.51	
Capital Subtotal	$495.70	$6,755.93	$8,948.80	$5,544.92	$44,359.36	$716.89	$66,821.60	
O&M Subtotal	$3,400.00	$34,000.00	$6,800.00	$6,800.00	$54,400.00	$3,400.00	$231,303.72	
Administrative Subtotal							$90,222.12	
Total Expenses	$10,839.63	$139,362.40	$27,349.56	$19,288.85	$154,310.84	$11,060.82	$574,937.95	
Net Revenue							($196,855.95)	

When looking at fiscal year 2009-2010, it is estimated that 9% of materials collected (by weight) on campus are actually recycled. Please note that this calculation only includes waste and recycling services provided by the Environmental Services Department and Gamecock Trash Company. The calculation excludes all roll-off waste services and services provided by outside vendors.



After looking at the percentage of waste captured, we were able to estimate the percentage of costs allocated to each waste stream. Please note that all costs are estimated as described in individual budgets. Since Environmental Services staff handle only the exterior collection of many materials, it is hard to compare the costs against the commingled bottles/cans, newspaper and mixed paper collection where the cost is a full cost accounting as Environmental Services staff handle both the interior and exterior collection of materials. All other programs include only costs to service materials already staged in dumpsters, compactors, and roll carts.



BUILDING WALK THROUGH ASSESSMENTS

In January 2011, RRS staff conducted a series of walk through waste assessments within several academic buildings and residence halls on campus. These assessments provided data on the number and type of recycling containers in the buildings, the number and type of waste containers and an overview of equipment at the loading dock. Our staff walked through and assessed the following academic and residence hall buildings.

Academic Buildings	Residence Halls
Russell House	Preston
Callcott Building	Woodrow
Sumwalt Building	Rutledge
Coker Life Sciences Building	Pinckney-Legare
Jones Building	Thornwell
Earth & Water Science Building	Harper-Elliot
Public Health Services	DeSaussure
Drayton-Wardlaw	Maxcy
McCutchen House	Columbia
Osborne Administration Building	Capstone
Currell Building	Wade Hampton
Davis Building	Sims
Petigru Building	McClintock
	McBryde
	Honors College
	West Quad
	South Quad

CONTAINER OBSERVATIONS

As RRS staff completed the walk through assessments, the following general observations for each type of recycling container or program were developed below.

OVERALL CONTAINERS AND SIGNAGE

RRS is providing the following observations on the general condition of the containers and signage within the academic and residence hall buildings.

- Recycling container labels are not clear or uniform
  - Unclear on what can be placed into some recycling containers
  - Signage is not uniform on collection containers or within buildings
  - Some signs identify plastic recycling as only #1 coded plastic bottles
  - Many signs identify the collection of only plastic bottles and aluminum cans – additional materials could also be placed inside recycling container increasing recycling volumes

- Missing labels/signage on many blue Rubbermaid containers and blue roll carts

- Labels/signage falling off many blue slim jim containers and blue roll carts
- Several blue roll carts are labeled incorrectly
    - Many blue roll-carts are hot stamped with a label – often the sticker label does not match the hot stamp label and label does not cover the hot stamp
- Each building has its own approach/style to signage and position of recycling containers
- Uniform branding, labels and message is needed
- Many of the containers are dirty

WASTE WARRIORS RECYCLING CONTAINERS

RRS is providing the following observations on the waste warrior recycling containers and signage within the academic and residence hall buildings.

- Most waste warriors are less than 10% full of office paper and newspapers
- Most waste warriors are 25% to 50% full of plastic bottles and cans (all #1 plastic bottles and aluminum cans)
- Most waste warriors are not located next to a trash can
- Most waste warriors are not located in high traffic flow areas – often placed off to the side
- The waste warriors blend in with their environment – beige in color with little accent coloring does not allow them to stand out
- The waste warriors could benefit from signage above the collection container (on the wall) or physically on the container further identifying them as a recycling container and what materials could be placed inside
- Some buildings tend to have an un-proportional number of these waste warrior containers
- Waste warriors do not seem to be used by the vast majority of building occupants
- Very little contamination was found in the waste warrior recycling containers
- Materials were well sorted in proper bins/slots

SLIM JIM RECYCLING CONTAINERS

RRS is providing the following observations on the slim jim recycling containers and signage within the academic and residence hall buildings.

- Slim jim containers are located within many buildings mainly in hallway locations as centralized collection points
- Slim jim containers are slim/narrow, are properly labeled and fit into many locations
- Many of the slim jim containers are dirty and need to be washed
- Slim jim containers seem to be well used by building occupants
- Slim jim containers have very little contamination
- As we talked with building and collection staff, general confusion on who is empting these containers

RECYCLING ROLL CARTS

RRS is providing the following observations on the recycling roll carts and signage within the academic and residence hall buildings.

- Recycling roll cart containers are located randomly throughout campus buildings –not all buildings have them
- Recycling roll cart containers are located randomly throughout buildings in which they occupy
    - No pattern seems to exist for their location
    - Are they to be used as centralized collection points for building staff?
    - Are they to be located in key areas to ease the transportation of recyclable materials through the building by the Environmental Services or Custodial staff?

- Many of the recycling roll carts are dirty and are in need of cleaning
- Many of the recycling roll carts need labeling or relabeling
- Many of the recycling roll carts are hot stamped with a label – additional sticker labels have been placed on the recycling roll carts, but these stickers do not match the hot stamp label
- Many of the recycling roll carts labeled as “newspaper” are actually collecting office paper
-

- If the recycling roll carts are being used by building occupants as either recycling containers or as a centralized collection location, concern about what happens when these recycling roll carts are swapped out of the building for service
    - Building is losing at least 1 day (in some locations 1.5 day) of available/potential service and/or usage of these cart when they are removed from the building and put at the outside curb for collection and then returned back to building for service

RUBBERMAID RECYCLING CONTAINERS

RRS is providing the following observations on the Rubbermaid recycling containers and signage within the academic and residence hall buildings.

- It seems like the intention for these Rubbermaid recycling containers was for use in office areas to collect white office paper as many are located under printer machines and by copy machine areas
- During our walkthrough, we found many of these Rubbermaid recycling containers in hallway areas collecting both paper and commingled bottles/cans
- Most of these Rubbermaid recycling containers are not labeled
- Many of these Rubbermaid recycling containers are dusty and dirty
- Some of these Rubbermaid recycling containers are lined with plastic bags – since the plastic bags are standard size bags, they drape all around the bin and floor
- These Rubbermaid recycling containers are not appropriate in the office setting and look out of place
- Rubbermaid recycling containers are small and somewhat out of sight – hard to notice unless you are looking for them
- Some of the Rubbermaid recycling containers have lids and many don't
- It is assumed that these Rubbermaid recycling containers are used in the waste/recycling rooms or alcoves within the residence halls because they are stackable.
    - These Rubbermaid recycling containers do not have sufficient capacity to properly service a residence hall
    - The position of the container and lids do not make them convenient for residence hall recycling
    - The process of emptying these Rubbermaid recycling containers is cumbersome since they are stacked – each container has to be unstacked, emptied and restacked within the waste/recycling rooms.

DESKSIDE RECYCLING CONTAINERS

RRS is providing the following observations on the deskside recycling containers and signage within the academic and residence hall buildings.

- It was our understanding that each desk or desk area was to be outfitted with a deskside recycling container for paper
    - During our walk through assessment, most of the desks and offices were found not to be outfitted with deskside collection containers
- Deskside recycling containers are blue Rubbermaid trash can containers with a recycling symbol
    - Signage does not indicate what recyclables can go into the containers – Paper or commingled bottles/cans – though it is assumed by many as paper recycling
- Missing a great opportunity to capture office paper at the desk
- General confusion from office and building staff on who is actually responsible for emptying these deskside collection containers (actual staff, Environmental Services, Custodial Services, or other University staff)

ADDITIONAL OBSERVATIONS

As RRS staff conducted the walk through assessments, additional observations came to light as they relate to the internal and external material collection and transportation processes.

TYPES OF MATERIALS COLLECTED

Major efficiencies could be created with a better understanding of the current processing contract as well as the dissemination of a single stream processing and collection solution.

- As a part of the University's processing contract with Pratt Industries, the Environmental Services Department needs to fully understand the range of materials that can be collected as part of their recycling program. A discussion on what materials could be commingled together would be highly beneficial. This information would greatly increase the amount and breadth of recycling that could be executed on campus. Examples below –
    - What can go into the commingled bottles/cans container?
        - #1-#7 plastic bottles
        - #1-#7 plastic bottles/tubs/containers
        - Only #1 and #2 plastic bottles
        - Aluminum, steel and tin cans
        - Cartons and aseptic containers
        - Is there an ability to commingle glass with the bottles/can stream?
    - What can go into the paper and/or newspapers container?
        - Office paper
        - Colored paper
        - Boxboard and other paperboards
        - Magazines
        - Newspapers

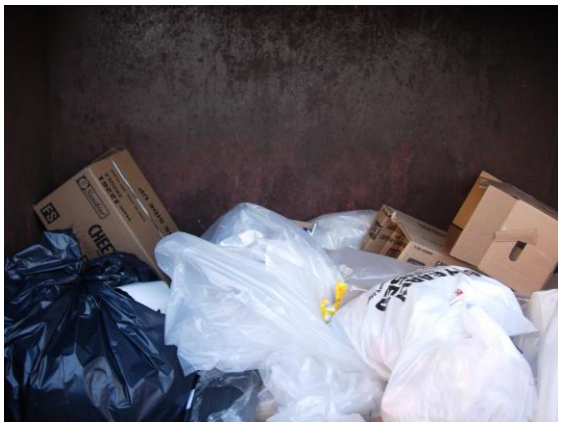
- RRS recommends terminating your current processing contract with Pratt Industries and evaluate a single stream processing solution.
    - Single stream processing would allow all materials to be collected together – the University would benefit from the optimization of program and collection containers as well as creating higher efficiencies in the Environment Services department collection and transportation operation
    - Recommend continuing to collect cardboard as its own stream of material. It is a clean material stream that has value. Could be taken to Pratt, Sonoco or other processor

INTERNAL RECYCLABLE MATERIAL COLLECTION AND TRANSPORTATION

As we traveled through the academic and residence halls, there seemed to be confusion and disconnect on how materials were handled within the building and how they ended up at the loading dock or external part of the building for final collection and transportation. Since there is a wide variety of collection containers throughout the buildings, it became somewhat unclear on who "officially" handles each of the below listed materials within each collection container.

- Collection containers and material types
  - Trash
  - Waste Warriors – Office Paper, Bottles/Cans Recycling
  - Rubbermaid Blue Recycling Containers – Office Paper Recycling
  - Slim Jims – Office Paper, Bottles/Cans and Newspapers Recycling
  - Toter Rolling Carts – Office Paper and Newspaper Recycling
  - Deskside Recycling Containers – Office Paper
  - Cardboard – located within offices, hallways and research labs
  - Bales of Cardboard

- Additional questions were brought to light when a collection container gets full within a building
  - Which department is notified?
  - Who empties the full container?
  - Where are materials placed/stored until weekly external collection occurs – particularly if there is no collection container at the loading dock/exterior of the building?



- Confusion on how cardboard is actually collected within each building
  - Some areas indicate that staff should take cardboard to dumpster or loading dock
  - Many buildings do not have an "official" loading dock
  - Many building do not have a cardboard recycling dumpster
  - Questions centered around - where does all the cardboard generated on campus actually go?
  - Missing a huge opportunity to collect a high value and fairly clean material stream
  - As we walked around, it was noted that many trash dumpsters had some to significant levels of cardboard inside

EXTERNAL RECYCLABLE MATERIAL COLLECTION AND TRANSPORTATION

As we visited the loading docks and exterior locations at the academic and residence halls, several issues were identified on how materials are stored before they are picked up on their weekly route and leave campus.

- Having a loading dock on the USC campus is a luxury. Many of the buildings do not have waste and/or recycling containers on the exterior. This is especially true for landlocked buildings and buildings on the Horseshoe.
- Moving materials (both waste and recycling) to a centralized final collection point is challenging
    - Absence of ramps in some locations
    - Stairs and multiple step areas create a work-arounds for rolling carts
- Cardboard dumpsters
    - Dumpsters have very little contamination – all dumpsters are slotted for broken down cardboard and side panels are screwed shut
    - Dumpsters are not located throughout campus
    - Dumpsters seem to get full before routed collection days
- Most buildings do not have rolling collection carts for office paper and commingled bottle/cans storage
- Most of the waste dumpsters have cardboard inside
- Many of the waste bags located in the trash dumpsters have commingled paper within the waste bags

RESIDENCE HALL WASTE SORT

RRS conducted a residential hall waste sort on March 17 and March 18 after it was determined from building walkthroughs and analysis of available data that sufficient waste and recycling data was not available for residence halls to provide an accurate estimate of existing possible waste diversion. This deficiency was addressed through a sort of residence hall waste.

Waste samples were collected from ten residence halls and from the Greek Village. RRS worked with a variety of campus staff and student volunteers as waste samples were collected from the following residence halls on the following days.

Thursday, March 17, 2011

- Preston
- Maxcy
- East Quad
- McClintock
- Wade Hampton
- Capstone House
- Greek Village

Friday, March 18, 2011

- The Roost
- Cliff
- McBryde
- Honors College
- West Quad

A detailed description of the waste sort protocol, data sheets and additional photos are located in the Supplemental Information section of this report. The following process flow diagram shows how materials were pulled and transported to the waste sort site.

A brief description of the process for collecting and sorting samples follows:

- Collections and sorting were scheduled to occur on two successive days, March 17-18, 2011.
- RRS staff met with housing staff (Margaret Bounds) and facilities/sustainability staff (Malte Weiland) at designated residence halls each morning
- Samples were collected from central collection stations on each floor of each residence hall. Where trash was dropped down chutes, trash was collected from compactors or bins located on the basement level. Typically 6-10 bags of trash were collected though in several residence halls only a smaller number of bags were available. Bags were labeled by residence hall.
- A facilities vehicle was used to pickup samples from each residence hall and deliver samples to the waste sort site at the facilities yard.
- Sorting was directed by RRS staff and performed by RRS staff, facilities and housing staff and by student volunteers.
- Each sample was weighed. Bags were opened on tarp-covered tables and sorted into buckets and carts. Each of the 35, sorted material categories, was weighed and tabulated for each sample.
- Data was entered into computer spreadsheets and summarized

Once the samples arrived at the waste sort site, individual bags were weighed and sorted into the following categories. Most of the category names provide self-evident descriptions of the materials included.

Paper

- High grade office paper
- Low grade paper
- Newsprint/magazines
- Corrugated cardboard
- Boxboard
- Aseptic packaging and beverage cartons
- Poly-coat papers (including coated freezer boxes and molded cups)

Plastics

- PETE #1 (bottle)
- PETE #1 (non-bottle)
- HDPE #2 (natural)
- HDPE #2 (colored)
- Polysytrene #6
- Plastic bags and film
- Other plastics #3-7

Metal

- Aluminum
- Other non-ferrous metals
- Tin/steel
- Other ferrous metals

Glass

- Clear
- Green
- Amber
- Other glass

Organics

- Food scraps/waste
- Other organics

Other Materials

- Textiles
- Office supplies
- Electronic waste
- Batteries
- Pharmaceuticals

Following are definitions for the less self-evident categories:

- Other Polycoat Paper – this material consists primarily paper cups and of freezer meals and other white board food packaging with a thin polyethylene film on one or both surfaces. This material is mostly high value sulfite bleached paper and is desired by mills that can separate the poly film
- PET Non-bottle (clear) – Thermo-formed clamshell food containers. These are labeled #1 (may be PETE or PETG). This is approximately the same resin as is used for carbonated beverages. Some buyers accept it with PET bottles (which are PETE). Others want to see it mixed with #3-7 plastics.
- Other Plastics – These are the plastics that are not labeled (#1-7) and not polystyrene foam or plastic film. This is mostly packaging material.
- Other Glass – Any non-bottle glass
- Other Organics – Plants, soil, etc.
- Electronic wastes – Electronic devices and components such as ink cartridges, disks, wiring
- Office Supplies – Pens, pencils, clips, rulers etc.
- Residue – Includes all items that did not fit other categories, bags waste was contained in and any unsortable fines or mush left in bags.
- Liquid Residue – Any liquid found in bottles, cups and other containers was dumped into a bucket and weighed as liquid residue. When possible, free liquid in the bottom trash bags was also dumped into the bucket. Liquids included beverages, water, detergents, lotions and juices from foods. Most of this material could have gone down a drain.

Material	Maxcy	McBryde	Preston	McClintock	Wade Hampton	Capstone House	Cliff	East Quad	Honors College	West Quad	Greek Village	Roost	All Percent
Corrugated	2.98%	5.06%	0.35%	6.01%	4.87%	3.23%	0.16%	5.43%	0.00%	2.45%	0.00%	5.61%	2.34%
Newspaper/Magazines	3.06%	1.15%	3.15%	5.48%	3.20%	3.04%	3.25%	2.21%	6.77%	3.42%	9.97%	2.65%	3.96%
High Grade Office Paper	1.70%	2.16%	0.96%	2.37%	1.49%	1.74%	1.88%	2.55%	1.09%	1.85%	0.57%	5.70%	1.85%
Low Grade Office Paper	2.13%	1.19%	0.79%	1.87%	0.33%	1.63%	1.18%	0.42%	1.91%	2.74%	0.00%	7.85%	1.72%
Boxboard	6.79%	8.70%	2.16%	3.82%	3.63%	1.92%	2.80%	7.68%	8.32%	6.49%	3.46%	5.65%	4.71%
Aseptic/Beverage Cartons	0.53%	0.56%	0.26%	0.21%	0.07%	0.37%	1.27%	1.13%	0.78%	1.36%	0.39%	0.00%	0.78%
Other Polycoat Paper	1.06%	2.38%	1.54%	2.76%	1.93%	1.99%	2.01%	3.05%	2.33%	2.44%	0.00%	2.20%	1.92%
Other Paper	5.64%	21.53%	20.63%	13.60%	12.39%	12.29%	5.18%	14.44%	8.12%	11.22%	11.43%	5.34%	10.81%
PET Bottle	6.23%	4.42%	1.40%	1.27%	1.53%	3.62%	3.79%	5.22%	16.13%	6.13%	0.90%	9.29%	4.51%
PET Non-bottle (clear)	0.43%	0.00%	0.08%	0.85%	0.51%	0.00%	1.27%	0.29%	0.36%	1.08%	0.25%	0.27%	0.65%
N-HDPE Bottle	0.29%	0.82%	0.35%	0.21%	0.40%	0.39%	1.49%	0.00%	0.21%	1.36%	0.25%	0.31%	0.77%
C-HDPE Bottle	0.00%	1.08%	0.17%	0.85%	0.36%	0.82%	1.45%	0.42%	0.47%	0.00%	0.23%	0.49%	0.57%
Foam Polystyrene (EPS)	1.81%	2.79%	2.04%	1.94%	2.33%	1.49%	1.36%	1.38%	1.50%	1.40%	4.28%	1.84%	1.92%
Plastic Film/Bags/Bubble Wrap	5.19%	2.53%	4.84%	5.09%	3.49%	2.82%	3.35%	4.92%	7.19%	7.08%	2.70%	3.59%	4.50%
Other Plastics	1.70%	2.49%	2.42%	2.16%	1.74%	1.46%	1.58%	1.96%	2.38%	2.66%	0.98%	2.47%	1.96%
Aluminum	2.95%	1.86%	0.44%	0.71%	1.13%	0.55%	3.63%	1.96%	1.03%	1.85%	0.72%	1.70%	1.85%
Other Non-ferrous	0.02%	0.30%	0.00%	0.29%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.03%
Tin/Ferrous Cans	0.45%	0.31%	0.61%	0.23%	1.20%	0.46%	2.23%	1.21%	3.00%	2.31%	5.04%	1.48%	1.83%
Other Ferrous	0.06%	0.00%	0.00%	0.00%	0.00%	0.05%	1.01%	0.00%	0.00%	0.97%	0.10%	0.31%	0.43%
Clear Bottle Glass	5.51%	2.01%	5.97%	1.70%	0.00%	3.30%	4.56%	0.00%	1.14%	2.59%	0.00%	0.00%	2.74%
Green Bottle Glass	2.26%	0.00%	0.00%	0.00%	0.00%	0.00%	2.19%	1.00%	0.00%	0.00%	0.00%	0.00%	0.65%
Amber Bottle Glass	0.00%	1.41%	0.00%	0.00%	0.00%	0.00%	0.00%	1.63%	4.50%	0.00%	1.50%	0.90%	0.49%
Other Bottle Glass	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Other Glass	0.00%	0.00%	0.00%	0.42%	0.00%	0.39%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.05%
Wood	0.00%	0.00%	0.00%	0.00%	0.00%	2.22%	0.00%	0.04%	0.00%	0.93%	0.00%	0.00%	0.37%
Food Waste	19.00%	9.30%	30.02%	23.39%	32.23%	25.04%	29.28%	16.94%	17.73%	14.89%	49.93%	15.75%	24.63%
Other Organics	0.00%	0.00%	0.00%	0.00%	0.00%	0.02%	0.00%	0.00%	0.00%	0.40%	0.00%	0.00%	0.08%
Textiles	1.54%	2.19%	0.85%	0.81%	2.03%	1.92%	11.63%	2.38%	0.83%	1.80%	0.00%	9.38%	3.85%
Office Supplies	0.00%	0.00%	0.20%	0.09%	0.20%	1.97%	1.05%	0.05%	0.06%	1.01%	0.12%	0.08%	0.63%
Batteries	0.10%	0.09%	0.00%	0.00%	0.00%	0.16%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.03%
Electronic Waste	0.07%	2.42%	0.00%	0.00%	0.47%	0.07%	0.00%	0.00%	0.00%	1.23%	0.00%	0.38%	0.42%
#3-7 Plastics	2.02%	3.53%	2.91%	2.54%	2.54%	1.35%	3.00%	5.09%	3.10%	6.38%	1.21%	1.93%	3.33%
Residue (waste)	6.09%	2.49%	2.98%	0.00%	5.67%	2.56%	1.36%	3.55%	0.88%	3.13%	0.90%	2.29%	2.54%
Liquid Residue (waste)	10.86%	4.50%	8.16%	3.00%	3.92%	17.24%	5.51%	7.93%	4.91%	10.83%	0.96%	6.50%	7.52%
Empty Bag Residue	9.50%	12.75%	6.70%	18.34%	12.25%	5.91%	2.54%	7.14%	5.27%	0.00%	4.10%	6.06%	5.55%
Pharmaceuticals	0.00%	0.00%	0.00%	0.00%	0.09%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	**100.00%**
Current Recyclables	27.67%	21.55%	14.19%	20.68%	14.50%	18.93%	25.82%	22.04%	36.24%	24.69%	19.19%	35.98%	23.32%
Potential Additional Recyclables	12.43%	17.36%	7.80%	10.99%	10.72%	7.60%	22.98%	19.62%	15.72%	20.53%	5.41%	19.74%	15.67%
Compostables	24.65%	30.82%	50.65%	36.99%	44.62%	39.57%	34.46%	31.42%	25.85%	27.43%	61.37%	21.08%	35.89%
												NET	25.12%

WASTE SORT OVERVIEW

Some caution is needed in interpreting results. The waste sort collected a sample of several bags from each building. Because the sample from some buildings was small and entire sample was all collected from one day's waste, the mix of materials from any one building could easily be affected by one student cleaning out a room or a party that took place on one part of the building. Accordingly, comparing building-to-building results is not a good indication of what might be seen on average throughout the year. At the same time, the aggregate result of the waste sort is likely a good representation of the average mix of materials in the residential waste on campus. Collection days were planned to avoid campus-wide events that might result in a significant deviation from typical waste.

Based on raw results, the waste sort demonstrated that:

- 23% of the residential waste could have been recycled in the existing recycling program
- Nearly 16% of the total residential waste could be recycled by including additional materials in the recycling program
- 36% of the residential waste stream could be composted
- Of the remaining 25% of the waste, additional materials could be recycled or composted if food service packaging for take-out foods were changed to more recyclable or compostable materials. Draining liquids would also significantly reduce the non-recoverable weight, though this might also be included in composting operations

The large number of sort categories resulted in relatively small quantities of most sort categories. Accordingly a scale with resolution to 0.001 kg would have provided more accuracy. The main scale used was limited to a resolution of 0.01 kg. RRS brought a scale with resolution of 1 gm (0.001 kg) but this scale was too small for efficiently weighing buckets and had a maximum weight capacity of 2.000 kg. It was used to weigh some small items.

RRS had set a goal of approximately 150 lb (68 kg) samples from each building. The average for all buildings was approximately 100 lb per sample. Because of the limited waste volume available at some buildings, four buildings fell in the 40-55 lb range. If future waste sorts are planned, additional time should be allowed for accumulation of samples. On the days of collection, some collection stations were empty or only contained one or two bags. In retrospect, it would not have been possible to sort 11 samples each weighing 150 lb in the allotted two days with the sort crews that were available.

All samples were weighed before sorting. These weights were compared to the sum of the weights of all sorted categories (including trash bags) at the completion of sorting. Some loss of weight was expected as almost every bag lost some liquid onto the sorting table and ground that could not be recovered for weighing.

The following table lists before and after weights for each sample and the net gain/loss.

Material	Maxcy	McBryde	Preston	McClintock	Wade Hampton	Capstone House	Cliff	East Quad	Honors College	West Quad	Greek Village	Roost
Before Sort (kg)	38.43	26.91	36.45	28.26	27.27	38.99	80.28	24.28	19.50	72.20	52.01	21.68
Sum of Sorted Categories (kg)	37.57	26.90	34.31	28.30	27.52	43.69	108.07	23.96	19.34	106.26	51.17	22.29
Weight Gain/(Loss) (kg)	-0.86	-0.01	-2.14	0.04	0.25	4.70	27.79	-0.32	-0.16	34.06	-0.84	0.61
Percent Change	-2.23%	-0.05%	-5.87%	0.15%	0.91%	12.05%	34.62%	-1.32%	-0.82%	47.17%	-1.62%	2.82%

The following events are potential sources of error. After the fact, these cannot be attributed directly to the discrepancies, but all could have played a part. Much of the potential for error results from a frequently changing crew with little or no waste sort experienced being trained on the job. Problems/errors were corrected when noticed but may have occurred unnoticed and uncorrected:

- Rounding Errors – The scale resolved to 0.01 kg. With as many as 40 weights per sample this could have resulted in an aggregate rounding error of 0.1 kg on any one sample either up or down. On the average over all samples, this rounding error would be expected to cancel out.
- Liquid loss – Any liquid that spilled out of bags on to the sort table was lost and not weighed as part of the sorted sample. This could account for as much as 2 kilograms from a single sample and is probably the main cause of sorted weights that are slightly less than un-sorted weights.
- Scale zero drift – The electronic scale maintained zero well during most of the sort, but late on the second day was observed to have drifted by nearly 0.1 kilogram. It was re-zeroed at that time. If several materials were weighed with this offset, some error in weights would have occurred for the sorted samples prior to re-zeroing. This could account for sorted totals being more than un-sorted weights. This is not believed to have affected more than one or two samples and could account for post sort weights exceeding pre-sort weight by up to one or two kilograms.
- The scale was sensitive to wind when large objects were placed on it. Strong winds during part of one day were problematic. Efforts were made to wait for the scale to settle, though this may have introduced some error in weights.
- All bags of each sample were brought to the scale before weighing prior to placing them on the sorting table. More than once, eager sorting staff started to place un-weighed bags on the sorting table. When this was observed, bags were retrieved and weighed before sorting. It is possible that some bags made it to the sorting table before being weighed without observation. This is the most likely explanation of sorted weights exceeding before sort weights by more than one or two kilograms.
- At the end of sorting each sample, buckets were brought to the scale for weighing. Weights were recorded and buckets were emptied into recyclables bags or trash containers. It is possible that some buckets were thought to be empty that were not and did not get weighed until the next sample was sorted. This almost happened on a few occasions and could have happened without notice on more than one occasion.
- At each weighing, tare weights were recorded for each weighed bucket. Unless the bucket had material clinging to it, the tare weight written on the bucket at the beginning of the sort was used. If unnoticed material was left in or on the bucket (prior to that sort), this could result in more weight being recoded than was sorted for that sample.

All of the percentages in the summary table are calculated as the weight of the sorted material divided by the sum of sorted materials. The pre-sort weight has no bearing on this calculation. The pre-sort weight is used to demonstrate that errors in handling and weighing of materials did occur.

STUDENT MOVE-OUT

As the academic year comes to a close, both the University Housing and Environmental Services departments handle a large amount of both usable and waste materials as students prepare to move out of their residence halls. Environmental Services mainly focuses on handling the waste materials located in the dumpsters as well as the standard list of recyclable materials collected on campus – cardboard, mixed paper, bottles and cans. University Housing collects a special list of reusable materials through their "Give It Up for Good" program which moves these materials to non-profit organizations instead of the materials entering the waste stream and landfill.

The "Give It Up for Good" program focuses on capturing food, clothing, household goods and small appliances within the residence halls via large Gaylord and packing cardboard boxes. These well labeled boxes are centrally located in each hall for the collection of the following items:

- Food – all non-perishable/unopened canned and packaged items
- Plastic Grocery Bags
- Clothing/Accessories – clothing, shoes, purses, belts and hangers (no socks or underwear)
- Household Goods – kitchen items, toiletries, paper products, cleaning supplies, office supplies and books
- Small Appliances – lamps, TV's, stereos, kitchen appliances, computers and printers

In addition to the interior collection areas, the majority of residence halls also have a bulk item collection area on the exterior of the building to collect furniture, carpet, large appliances, loft wood, scrap metal, cement blocks and other large bulk items.

In 2011, the last day of classes was April 25 with finals ending on May 4. All students were required to move out of the residence halls by May 5 at 10am, with seniors allowed to move out by May 8 at 12pm. In an effort to prepare for the students to move out, donation collection centers were set up on April 21-22 in the below residence halls to capture the above list of reusable items.

Residence Hall	Donation Area	Location	Bulk Area Collection	Location
North Campus				
Capstone	X	Lobby	X	Along bldg left of entrance
Columbia Hall	X	Lobby	X	Outside back door
French House	X	2nd Floor Landing	X	Outside – right of entrance
Maxcy, DeSaussure, Harper/Elliot, Thornwell	X	Maxcy main lobby	X	Maxcy back porch
Preston, Pinckney/Legare, Rutledge, Woodrow	X	Preston main lobby	X	Preston back porch & Woodrow dumpster enclosure
Central Campus				
Honors College	X	Main lobby	X	Fire lane outside entrance
McBryde	X	Lounge in Building F	X	Outside building F and across from building C
McClintock	X	Lobby	X	Top of stairs in Women's Quad
Sims	X	Lobby	X	Top of stairs in Women's Quad
Wade Hampton	X	Lobby	X	Top of stairs in Women's Quad
South Tower	X	Lobby	X	Dumpster area downhill from entrance
South Campus				
Bates House	X	Lobby	X	Breezeway on 2nd floor
Bates West	X	Main lobby		
Cliff	X	Lobby	X	Ground floor entrance by cardboard dumpster
East Quad	X	Lobby in both wings	X	Loading dock on Wheat St.
South Quad	X	Main lobby and ground floor in international hall	X	Loading dock on Wheat St.
Green Quad	X	Lobby in A and C buildings and near elevator on 1st floor of B building	X	Loading dock behind C wing
Roost	X	Lobby on 2nd floor	X	Outside ground floor entrance

University Housing provided donation pick-ups from the above list of residence halls April 25 through May 10. Housing staff conducted daily pick-ups from the following residence halls: Capstone, Women's Quad, South Tower, West Quad, Honors, and South Quad. The Housing staff provided pick-ups from all the remaining residence halls on an on-call basis as long as a pick-up was requested before 10am by Residence Life/Custodial/EcoReps staff in that building. Housing provides one round of collection pick-ups each day for each residence hall. University Housing also provided donation pick-ups at the Greek Village per the request of each house on two separate days (April 29 and May 6).

University Housing staff enter each residence hall and empty the contents of each donation box into black plastic bags. Each set of materials are bagged separately and then transferred to a Housing vehicle. These materials are then transported to the Facilities warehouse on Pulaski Street where they are stored until a large enough load is ready to take to the designated non-profit. The following non-profits were the final destination for the below list of materials:

- Habitat for Humanity ReStore – appliances, cement blocks and wood, clean carpet
- English Program for Internationals – appliances, furniture and household items
- Salvation Army – clothing/accessories and hangers
- Harvest Hope – food, cleaning supplies, toiletries and plastic bags
- Soles for Souls – athletic shoes
- ReCellular – cell phones
- Better World Books – books
- State surplus – wood and cement blocks

Bulk items are also picked up by University Housing staff and transported to for recycling or roll-off waste disposal. All materials are weighed when transported to their final destination of reuse, recycling or disposal. There is fairly extensive communications and outreach effort that occurs as part of the "Give It Up for Good" program. The following outreach is conducted by the following entities:

- Housing Marketing Department
  - Press releases sent to Media Relations, The State and other local media
  - Flyers put up in each residence hall
  - Information placed on Housing FaceBook page
  - Slide developed for WRHA and Housing digital display boards

- Housing Sustainability Coordinator
  - Information placed on Sustainable Carolina and Recycling FaceBook pages
  - Information provided to Daily Gamecock newspaper
  - Signage placed at donation centers and in lobbies

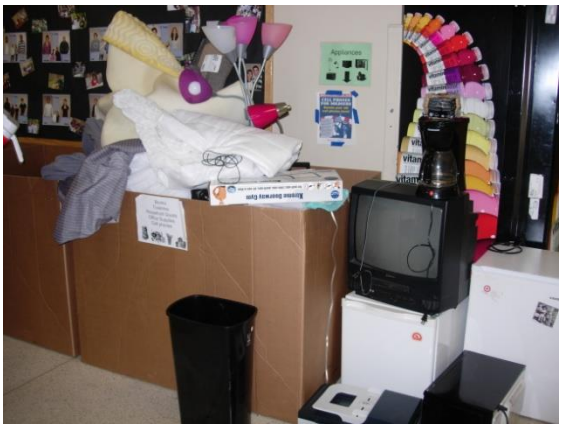
- Residence Life
  - Information provided to all RMs during move-out hall meetings
  - Email sent to all residence hall residents

- Facilities
  - Sends out a campus notification memo

The Environmental Services department places additional dumpsters in several campus locations to handle the increased waste that is generated as students move out. The department also increases all trash collection services to two times per day (and additional service is available if requested). Large roll-off dumpsters were placed at Bates West (2 – 30 cubic yard roll-offs), Columbia Hall (30 cubic yard roll-off) and East Quad (40 cubic yard roll-off) to handle the larger amounts of waste.

WALK THROUGH ASSESSMENT AND NOTES

RRS staff members were on site on May 3 and May 4 to observe the "Give It Up for Good" program. On May 3, we observed one full collection route in the morning, high traffic residence hall collections in the afternoon and in the evening staff walked around to the larger residence halls to see how the donations were stacking up in the evening. On May 4, we had a late start due to the Housing Appreciation Breakfast, so the entire day was spent getting through the majority of residence halls before the end of the day at 5pm. Below our staff have provided an overview of our notes, assessments and recommendations on the program.



May 3 Observations

- During the morning shift of collecting donations, most of the collection boxes were very light of materials.

- Large Gaylord boxes are used in several of the residence halls. While they provide enormous capacity to collect donations, they are very challenging to empty and service by staff. Gaylord boxes were suitable used to capture/collect a large volume of carpet which had to be removed by Housing staff to the bulk collection areas at each hall. If the boxes were not as large, the collection of carpet would not be encourages.

- The use of black plastic bags for the collection of donation materials made it challenging to organize donation bags on the truck and to sort materials at the Housing Facilities warehouse. Staff would guess based on feeling the bag or have to open the bag to identify the materials inside designating it for a specific non-profit organization location/storage area within the warehouse.

- Too many staff were conducting pick-ups on May 3. The amount of staff used for the collections could be more streamlined. Two staff were tasked with going into each residence hall to bag and stage donations for pick-up, four staff members were tasked with riding in the van to pick up donations and five staff were collecting bulky materials from the exterior of residence halls. Housing staff stated that this was the first year that they were using temporary staff to help for the week.

- More warehouse space is needed to store donations. The current Housing Facilities warehouse space is approximately 90% occupied leaving very little room for donations to be stored. There is no space to further sort materials. Additionally the limiting space requires that a run of donations are delivered to each non-profit on a daily basis so that space can be freed for the next day's incoming donations.

- No home has been found for the foam bed padding – at this time all of this material is placed in the trash

- Since a very basic material sort occurs at USC, concerns over the actual reuse of materials being donated to non-profits. It has been stated that the non-profits do not want all the clothes/textiles provided to them

May 4 Observations

- Housing always has their annual staff appreciation breakfast during the student move-out week and this year the breakfast was on May 4. This was very inconvenient as staff were in the appreciation breakfast from 9am until 11am. Most of the morning was lost to this event therefore putting Housing collection staff behind in getting to the residence halls to pick up donations.

- Collection areas were heavy with donations. Majority of halls had overflowing boxes which took a long time to empty and transfer the Housing vehicles.

- Carpet was a huge issue on this day. Majority of residence halls that had Gaylord boxes had huge issues with carpet being placed in these boxes and throughout the lobby area. Carpet did not seem to be as much of an issue in the residence halls that housed smaller collection boxes in their donation areas.

- Getting all the donation materials in the warehouse facility was challenging. The warehouse had very little space to house donations and with a tremendous increase in materials on May 4, finding space to store these materials became complicated.

Recommendations

- A better strategy needs to be enlisted to collect donations from the Horseshoe. There were three donation areas set up to service the eight residence hall buildings in the Horseshoe. Concerned that students or staff are not transporting reusable materials/donations to these collection areas because they are not conveniently located. In general the Horseshoe is a hard location to service because of the landlocked buildings, few service area locations and heavy car traffic.

- Currently Housing staff are using black plastic bags to collect donations. These bags, while heavy duty in nature are efficient as they are large and do not puncture easily, make sorting materials at later times challenging as you cannot see what is in each bag. We would recommend using a clear plastic bag for the collection of these materials. Stronger plastic bags can be used to avoid puncturing. The clear bags will allow a visual recognition of materials within each bag allowing for better organizing and sorting after materials are collected from each residence hall and at the Housing Facilities warehouse.

- Evaluate different collection boxes for the collection areas. The Gaylord boxes are efficient in handling a large amount of material, but they are very challenging for staff to empty. These boxes often get cross contaminated with multiple materials and become a home for large rolls of carpet. If smaller boxes were used, there is a potential that these boxes could be lined with plastic bags for easier servicing.

- Carpet is a very challenging material to get rid of during a move-out program. Most non-profits are not interested in taking the material as it is often dirty and the sizes are not conducive for most purposes. Housing staff had discussed working with an animal rescue organization to take this material, but assume they cannot handle the amount of materials generated on campus. For the future, look into a textile recycling facility to handle the material or consider making carpet a “banned” material from the residence halls. If the material is not generated in the first place then the handling and disposal of it is not needed at the end of the year.

- Staffing could be more streamlined to be more efficient in not only collecting materials, but in also providing additional service times. In an effort to not duplicate efforts within each hall, it would be best to have two/three staff members go to the hall, pull all materials and then transport them to a collection vehicle. In this effort, you could service several areas of campus at the same time with crews. This would avoid duplicate efforts and parking troubles as you currently have two teams going to each hall (one team bags materials and the other team collects the materials). Would continue to use temporary staff during the heaviest move-out week so that efficient and timely service can be provided to all halls.

- Each front desk lobby area needs to have a set of move-out instructions available for staff. Each of these lobby areas are manned by a person – many which had no idea how to direct students that might have questions about what to do with donations, recycling or bulk waste.

- As Housing staff enter each residence hall, it would beneficial to track how much material is coming out of each residence hall not only to gage service efficiencies but to promote program results. Currently no metrics are tracked on a per building basis. A simple, five bags of household items and four bags of food were collected at “XX” residence hall during this collection route time would be a beneficial metric to the program.

- A textile recycler should be used to help find a home and be an additional waste reduction outlet for textiles of all sorts. A textile recycler could help take all foam bed padding and unwanted clothing/textiles for recycling. This outlet could provide additional waste reduction opportunities and provide the non-profits which only high quality materials which would provide the most resale in their stores. A local textile recycler Carolina Textile Recycling (located in Walterboro, SC) could be a possible outlet. They will site a semi truck trailer onsite for the collection of these materials.

- If a larger warehouse/storage area could be used, this would create the ability for the non-profits to pick-up the donations directly from USC instead of USC delivering these donations to the non-profits. This would save a tremendous amount of time and allow Housing staff to further sort materials so that each non-profit gets exactly what they want thereby preventing additional waste entering the landfill from the non-profit side (if a non-profit doesn't want the item, they might dispose of it instead of finding a proper home for the material).
    - The Facilities waste pad could be used to store and sort donation materials during move-out. This space is covered with easy access for both University and non-University vehicles.

- The Housing Appreciation Breakfast needs to be moved to another timeframe outside of student move-out. It is interesting that this breakfast falls during this timeframe as most Housing staff are in full swing with the students moving out. If the breakfast could be moved to after student move-out, all staff would be able to better appreciate the breakfast and time.

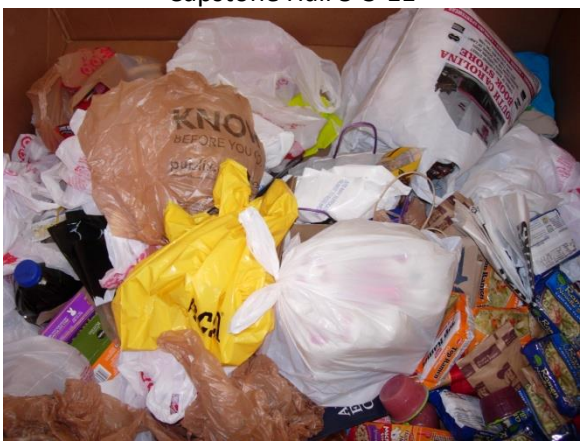
- During the heaviest week of student move-out, two residence hall sweeps should be conducted so that all donation boxes are empty by 5pm-6pm each night. Many students move-out during the evening hours and if only one sweep has been conducted in the morning, then donation boxes are overflowing and creating a mess in each residence hall lobby. Staggering Housing staff shifts during at least the heaviest week would provide many opportunities. One shift of staff could work from 7am until 3pm, while another shift could work from 12pm-8pm.

- Additional education and outreach mechanisms could be used to provide additional information to residence hall residents. Some options might include – (1) developing larger posters (larger than the current 8.5 x 11 size), (2) place posters/flyers in elevators (did not occur this year), (3) place posters/flyers in waste and recycling rooms (none of the rooms housed these signs), (4) place posters/flyers in each bathroom stall on the back of the door, (5) dedicate a website or a page on a current website to student move-out details, (6) provide concrete set of instructions for all RHA staff, hall directors and front desk lobby staff, etc.

Photos from Move-Out

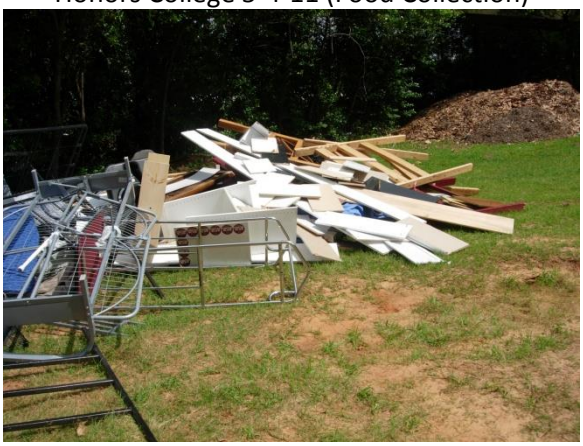
Capstone Hall 5-3-11

Roll-off Outside East Quad 5-3-11

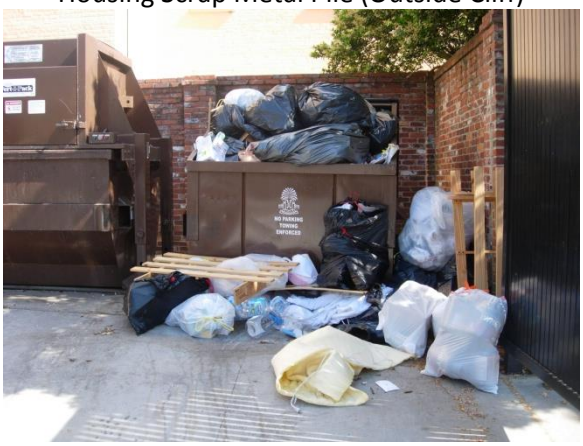


Honors College 5-4-11 (Food Collection)

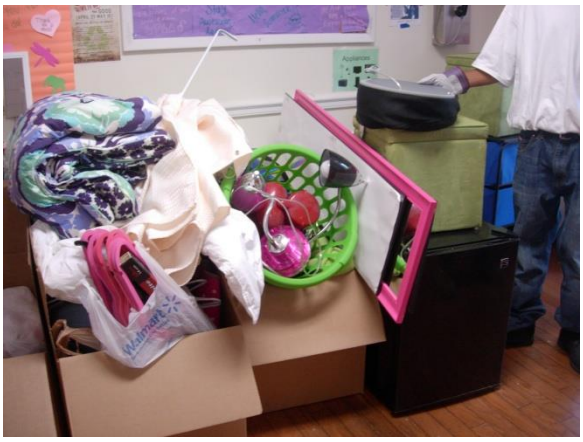
Housing Scrap Metal Pile (Outside Cliff)



Housing Scrap Wood Pile (Outside Cliff)



Dumpsters Outside Maxcy 5-4-11



McClintoch Hall 5-4-11

West Quad Dumpster 5-4-11

South Tower 5-4-11

Preston 5-3-11

Photos from Facilities Warehouse

ATHLETICS DEPARTMENT AND EVENTS

As the Environmental Services Department is looking to make recycling and waste reduction a top priority at USC, targeting athletics is an essential area of campus for these efforts. As part of our work, we attended a Gamecock men's basketball game at the Colonial Life Arena in January 2011 and followed-up with an attendance to the Professional Bull Riding (PBR) bull riding event in March 2011 at the Colonial Life Arena to understand what waste materials were generated and could be diverted as part of the athletics operation. Before both of these site visits, we sat and talked with several members of the athletics department and Global Spectrum (contractor who manages the Colonial Life Arena) to assess their understanding of available waste reduction services on campus as well as their willingness to participate in these and expanded programs. Compared to many universities, the USC athletics department is very open to expanded waste reduction programs and a green presence on campus and at their events.

In October 2011, our staff assessed the recycling and waste operations at the Williams-Brice Stadium and within the tailgating areas.

ATHLETIC DEPARTMENT GREEN INITIATIVES MISSION

The mission of the Green Initiative Committee of the Athletic Department is to advance the University of South Carolina athletic departments efforts towards becoming sustainable leaders on campus. By working with Sustainable Carolina, the athletic administrators, other student athletes, and all other affiliations, would like to integrate sustainable practices into athletic facilities and competition. The department aims to have these initiatives integrated into the everyday lives of student athletes at the university.

I. Campaigns I: Recycling and Reusable Products
    a. Short Term Projects:
        i. Recycling bins in locker rooms, training rooms, and other athletic facilities
        ii. Voicing opinion on new plans for the Farmers Market
        iii. Reducing waste of cardboard Gatorade cups
        iv. Recycle athletic shoes through Soles4Souls program
        v. Utilization of recycling bins at baseball games
        vi. Using athletic events to promote Recyclemania
    b. Long Term Projects:
        i. Recycling at football games- inside the stadium and outside the stadium including the state fairgrounds
        ii. Recycling initiatives in the new athletic village
        iii. Publications, media guides printed on recycled paper or certified paper from sustainable forest
        iv. Fair trade and organic material for team uniforms

II. Campaign II: Carbon Offset and Energy Savings
    a. Short Term Projects:
        i. Team community service projects as offset for travel
        ii. Turning off the lights in study rooms, turning off computers, etc.
    b. Long Term Projects:
        i. Carbon neutral football game
        ii. Tree and garden planting at the new athletic village
        iii. Athletic department hydrogen fueled bus for team travel to athletic competitions
        iv. Upgrading to LEED gold certification in the new athletic village

III. Campaign III: Sustainable Food Systems
    a. Short Term Projects:
        i. Composting waste from 'Training Table'—pilot program for the University
        ii. Table tents at Training Table to communicate sustainable eating practices including seasonal produce
        iii. Reanalyzing sources of food used at Training Table to include organic products and local produce
    b. Long Term Projects:
        i. Plant new garden in athletic village for fresh produce to use at Training Table. Teams can receive community service hours for working in the garden and athletes can utilize the food they plant.
        ii. Gamecocks Giving Back: Habitat for Humanity projects, integrate planting of gardens in home rebuilding
        iii. Community service in schools raising awareness of sustainable food systems

MEN'S BASKETBALL GAME EVENT

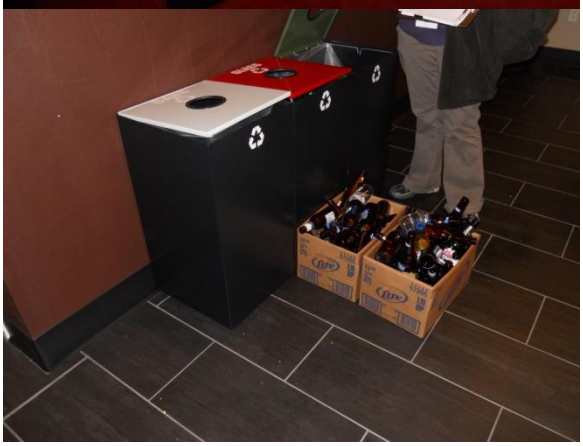
On Wednesday, January 19, 2011, RRS staff walked through and assessed the operation and waste materials at the men's basketball game in the Colonial Life Arena. This walk through assessment was conducted to witness the type and quantity of materials generated at university athletic events to better understand and expand waste reduction activities at the Arena.

During our walk through assessment, we arrived at the basketball game approximately one hour in advance to see how the concourse is set up with collection containers, identify which vendors were serving food and what opportunities could be promoted. During our initial walk through we identified approximately 16 recycling containers on the concourse (9 of which were stationed next to trash containers, 7 which were standing alone) and 21 trash containers. The recycling containers were collecting aluminum and plastic bottles only. The containers are large in statue and only labeled on two sides (no labeling on the front of the container). There were no recycling containers located within the stadium only on the exterior concourse. There is no mixed paper collection anywhere on the concourse or available for patrons.

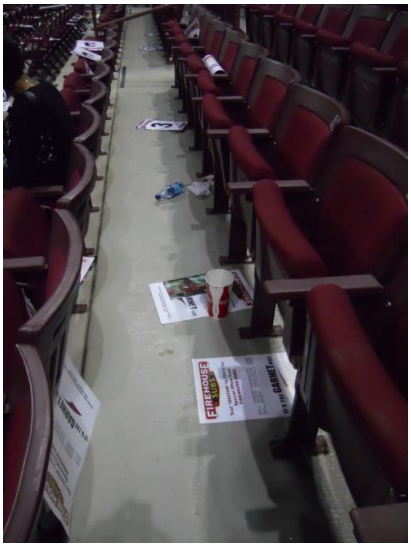
To better assess what types of recycling could occur at the Arena, we looked at what vendors were in operation and what materials they were selling. This evaluation will provide the best understanding of what type of recycling could be instituted. Here is a list of vendors that were in operation and what type of material packaging was used with the products they were selling.

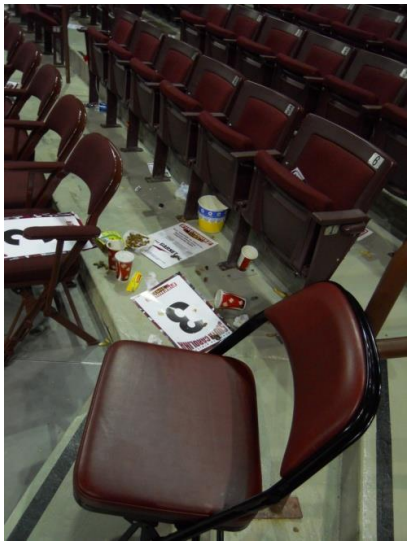
Vendor	Types of Products and Waste Produced
Maui Wowi Smoothies	- Smoothie - #1 PETE plastic cups
Carolina Marketplace	- Bottled water - #1 PETE plastic bottles - Bottled soda - #1 PETE plastic bottles - Fountain soda – polycoated paper cup - Fountain soda - #7 plastic souvenir cup - Popcorn – polycoated paper cup - Nachos - #6 plastic tray
Little Caesars	- Pizza – polycoated paper plate
Oriental Kitchen	- Bottled water - #1 PETE plastic bottles - Bottled soda - #1 PETE plastic bottles - Fountain soda – styrofoam cup - Fountain soda - #7 plastic souvenir cup - Sushi - #6 plastic boxes - Chicken kabobs – polycoated paper tray - Paper carrying trays – molded paper
Dippin Dots	- Ice cream - #1 PETE plastic cup
Grilled Carolina	- Bottled water - #1 PETE plastic bottles - Bottled soda - #1 PETE plastic bottles
Flatiron Grill	- Bottled water - #1 PETE plastic bottles - Fountain soda – polycoated paper cup - Fountain soda - #7 plastic souvenir cup - Chicken tenders – polycoated trays - French fries – polycoated trays - Hotdogs – heavy tissue paper trays - Paper carrying trays – molded paper
The Nutty Bavarian	- Seasoned nuts – polycoated paper wrapper
This Fries For You	- Fountain soda – polycoated paper cup - Fountain soda - #7 plastic souvenir cup - Chicken tenders – polycoated trays - French fries – polycoated trays

Overall most of the recycling containers on the concourse were fairly clean of contamination and do house the appropriate recyclables, but in very low quantities. The trash cans on the concourse do have some recycling in them, but the majority of the recycling is left inside the stadium seating on the floor. In addition to the recycling on the concourse, each suite has individual recycling containers inside each suite. Recycling containers collect glass, aluminum cans and plastic bottles. Per Jonathon with CMS, most of the recycling collected within the Arena comes from the suites. In many of the suites #1, #5 and #6 plastic cups are used for draft beer and wine.



CMS is the contracted cleaning crew that cleans the Arena after each event. All materials that CMS collects is placed in black plastic trash bags and disposed of as trash. Approximately 13 CMS staff flush the Arena from top down to the court, picking up all materials (waste and potential recycling) by hand. Larger venue events (i.e. concerts) require approximately 30 CMS staff to clean the Arena. Once a black plastic bag is filled, the bag is left in place in the aisle. These bags are then moved up to the concourse where they are placed in gray tip carts for transferring to the loading dock. CMS staff also flush the trash and recycling containers on the concourse and transfer these materials to the loading dock for collection.





Once materials are transferred to the loading dock, materials are taken to several locations for storage. Recyclable materials are taken to a series of 96 gallon carts for storage. At this time, there were 2 aluminum carts, 1 mixed paper cart and 2 brown glass carts all serviced by the City of Columbia once per week. Global Spectrum staff have gone through and weighed what an average cart weighs depending on how full it is for their tracking purposes.

Collection Bin Weight Chart (lbs)				
	Paper	Plastic	Aluminum	Brown Glass
1/4 full cart	11.5	3.5	5	35.5
1/2 full cart	23	7	10	71
3/4 full cart	34.5	10.5	15	106.5
1 full cart	46	14	20	142
1 & 1/4 full carts	-	-	25	177.5
1 & 1/2 full carts	-	-	30	213
1 & 3/4 full carts	-	-	35	248.5
2 full carts	-	-	40	284

Every week Jason with Global Spectrum observes how full each recycling cart is and this information is placed into a report for Athletics. Here is the information Jason provided to us for the amount of recycling that has occurred in 2010.

2010 Weekly Recycling Collection Weight

Collection Material					
Date	Paper	Plastic	Aluminum	Brown Glass	Total
1/5/2010	11.5	7	20	177.5	216
1/12/2010	23	7	15	106.5	151.5
1/19/2010	23	10.5	20	142	195.5
1/26/2010	11.5	3.5	10	35.5	60.5
1/29/2010	23	10.5	20	284	337.5
2/2/2010	0	7	15	142	164
2/9/2010	23	3.5	10	35.5	72
2/16/2010	46	10.5	20	284	360.5
2/23/2010	23	14	30	213	280
3/2/2010	23	14	35	284	356
3/9/2010	23	14	35	284	356
3/16/2010	46	3.5	5	0	54.5
3/23/2010	11.5	0	5	0	16.5
3/30/2010	11.5	3.5	5	71	91
4/6/2010	0	0	0	0	0
4/13/2010	23	3.5	10	0	36.5
4/20/2010	23	10.5	10	0	43.5
4/27/2010	0	7	5	0	12
5/4/2010	34.5	14	40	284	372.5

Date	Paper	Plastic	Aluminum	Brown Glass	Total
5/11/2010	23	14	5	0	42
5/18/2010	57.5	3.5	15	0	76
5/25/2010	23	3.5	15	0	41.5
6/1/2010	11.5	0	0	0	11.5
6/8/2010	0	0	0	0	0
6/15/2010		Not observed			
6/22/2010		Not observed			
6/29/2010		Not observed			
7/6/2010		Not observed			
7/13/2010		Not observed			
7/20/2010	34.5	50	0	0	84.5
7/27/2010	0	0	0	0	0
8/3/2010	46	0	0	0	46
8/10/2010	0	0	0	0	0
8/17/2010	0	0	0	0	0
8/24/2010					
9/20/2010	0	0	40	142	182
10/12/2010	46	14	15	71	148
10/19/2010		Not observed			
10/26/2010		Not observed			
11/2/2010	46	14	40	284	384
11/9/2010	11.5	0	5	35.5	52
11/16/2010	0	0	0	0	0
11/23/2010	23	3.5	5	35.5	67
11/30/2010	11.5	3.5	5	35.5	55.5
12/7/2010	11.5	14	15	35.5	76
12/14/2010	23	3.5	5	35.5	67
12/21/2010		Not observed			
12/28/2010		Not observed			
Total	**747.5**	**267**	**475**	**3,017.5**	**4,509**

Additionally on the loading dock, there is cardboard baler where all cardboard is placed for baling. Per Jonathon with CMS, it takes approximately 3 to 4 events to produce a bale of cardboard. The Environmental Services department picks up these bales on an as needed basis. A 25-30 cubic yard trash compactor is also found at the loading dock. A chute feeds the compactor directly from the main CenterPlate kitchen as well as other waste materials that are emptied into the compactor unit from arena waste collections. Since the unit is self contained, it was challenging to see what types of materials were actually in the unit. This compactor unit is serviced after each game by the outside contractor Waste Management, Inc.

The volume of waste and recyclable materials varies depending on the event calendar. In the spring, there are approximately 5 to 6 events each week. The summer is considered the slow season which sporadic events occurring through the summer. The fall begins the ramp up to the busy spring season.

GENERAL RECOMMENDATIONS

- In general, recycling containers could be placed in more convenient locations, more clearly labeled and be in a different color to help make them stand out for patron use.

- Placing recycling containers at each of the Arena entrances (on the exterior and interior of the building) would collect additional recyclables. Since you can't bring in outside food and beverage, we noticed that the trash cans before the ticket gates housed many recyclables.

- Placing recycling containers at the entrance/exit of each stadium section would also be beneficial. These containers need to be placed next to a trash container to ensure maximum benefit. This placement would encourage the recycling of containers as patrons enter and exit the stadium bowl, as opposed to requiring patrons to find a recycling container on the concourse.

- Paper recycling could also be beneficial. There are paper programs, molded food trays and paper signage that are passed out during the game. At this time there is no outlet to collect and recycle this material.

- In game education would also be very beneficial. PSA's or announcements during the game would educate and remind patrons to recycle their waste materials.

- Need to talk with CenterPlate about their ability and willingness to embrace sustainability measures and what actions they could take on the purchasing side to ensure that food packaging materials are recyclable. A brief meeting was conducted with Michael Jennings to discuss some of these issues. RRS has requested information on the quantities of materials CenterPlate has purchased to identify the overall monthly quantities of items used, but this information has not been received. If we could get a count on how many #1 plastic cups, souvenir cups, #6 plastic nacho trays, bottles of water and soda, paper food trays and paper programs were purchased, then we would have a good understanding of what types of recycling could be put into place.

- Working with CMS to collect recycling in separate clear plastic bags when they are cleaning out the stadium bowl would produce a much larger amount of recycling than is currently being collected.

PROFESSIONAL BULL RIDING (PBR) BULL RIDING EVENT

On Friday, March 18, 2011, RRS staff walked through and assessed the waste materials at the PBR Bull Riding event at the Colonial Life Arena. This walk through assessment was conducted to witness the difference between what waste materials were generated at a non-university event to see how they compared to a university athletics event. Overall, the PBR event did not provide a great insight into our questions about non-university events as the venue's attendance was extremely small (approximately 1,200 people with only approximately 8 suites occupied). Since the event was held in the evening and the attendance was low, many of the vendors were not open serving food. For the most part the waste and recycling containers had very little material within them so assessing a standard list of potential compostable or recyclable material was challenging.

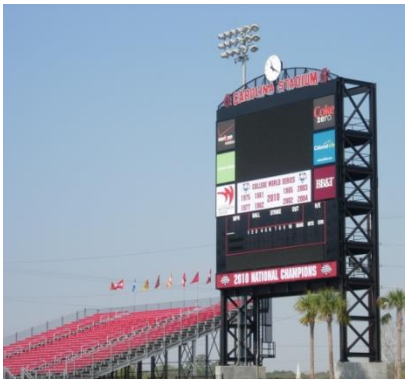
One major difference between the two events was the addition of alcohol at the PBR event. Coors, Miller Lite and Bud Light were all sold in aluminum bottles for $6.50 each and wine was sold in small #1 PETE plastic bottles. The standard list of event food including popcorn, hotdogs, peanuts, nachos, pretzels, cotton candy, Dippin' Dots, bottled water, fountain soda (in stadium cups) and bottled soda were also sold during the event. The 'Flatiron Grill' was open serving chicken, burgers and French fries, while the remainder of the food vendors were closed or selling the above listed materials in a limited capacity.

Overall very little data and additional observations were available from the event.

OTHER ATHLETIC FACILITY RECYCLING

On Saturday, March 19, RRS staff toured additional athletics venues on our own to assess what types of recycling containers and programs were available at each venue site. This is not meant to be a thorough evaluation, but a quick assessment of what is available on campus.

MEN'S BASEBALL FIELD

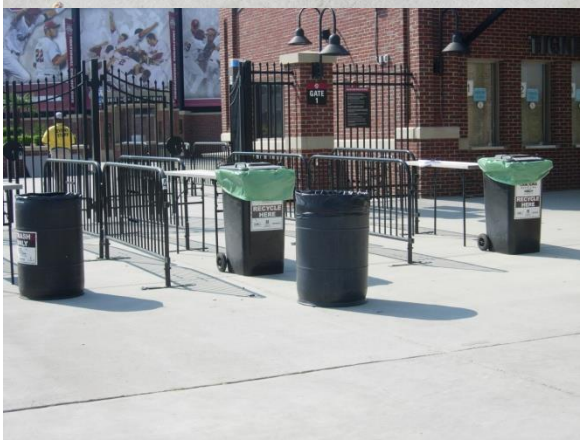


The men's baseball field is a good example of athletic/event recycling. When you walk up to the venue, each trash can outside the venue's gates has a recycling container next to it for the collection of bottles and cans. The trash cans are black in color, while the recycling containers are green. The recycling bins (sponsored by the SC Department of Health and Environmental Control (DHEC) and Palmetto Pride) are all lined with green plastic bags and are found next to each trash container within the baseball area concourse and vending areas. Since we did not have access to enter the facility, we are unsure of how recycling occurs with the vendors and at the "back of the house" (behind the operations.


CAROLINA
RECYCLING
RECYCLE
HERE


TRASH
ONLY
Litter
Trashes
Everyone.
Don't Do It.
PalmettoPride


PLASTIC BOTTLES GO HERE



WILLIAMS-BRICE STADIUM AND TAILGATE RECYCLING ASSESSMENT

On October 2, 2011, RRS staff attended a football game at the Williams-Brice Stadium. During our visit we assessed the recycling program and activities at both the Stadium and tailgating areas.

TAILGATE RECYCLING

The tailgate recycling initiative at USC is a partnership between the Environmental Services Department and Sonoco Recycling. As a part of this initiative, volunteers distribute blue recycling bags around two locations adjacent to the football stadium. Plastic bottles and aluminum cans are the only materials collected as a part of this initiative. Tailgaters have the choice to leave the blue recycling bags on the ground near their tailgating event or bring their recyclables directly to the Sonoco Recycling trailer located centrally within the Farmer's Market site. The Environmental Services Department uses their truck to pick up any blue recycling bags left in the tailgating area and bring them to the Sonoco Recycling trailer. Waste Management collects all wastes in this area around 7am on the following day.

The Environmental Services Department's crew is composed of approximately 10 student volunteers that work the tailgate area and pass blue recycling bags out to tailgaters. After meeting up on-site, the volunteers disseminate into the Farmer's Market parking lot giving recycling instructions and distributing blue recycling bags to tailgaters. Two volunteers walk to the Fairgrounds parking lot to distribute the blue recycling bags and give recycling instructions. After the game begins, the Environmental Services truck is used to collect the blue recycling bags from the Farmer's Market and Fairgrounds sites from 2:30 pm to 4pm.

OBSERVATIONS

Farmer's Market Site

This location is equipped with the Sonoco Recycling trailer and receives the larger amount of student volunteers. The crew arrives at the Farmer's Market site at 10:45 am to start handing out blue recycling bags. Recycling volunteers distribute the blue recycling bags but provide no recycling guidelines or brochures for people to take. In previous years, volunteers distributed the blue recycling bags at the entrance of the parking lot but this practice has been discontinues because of traffic backups.

Most people take the blue recycling bags and tie them to their car or tent. About 50% of the people place plastic bottles and aluminum cans into the bags. However, there are still many opportunities for recycling education and reinforcement since approximately 50% of people fill up the blue recycling bags with trash. Many of the trash cans throughout the Farmer's Market site contain recyclables – mostly aluminum cans, plastic bottles and glass bottles.

Fairgrounds Site

The Fairgrounds site differs slightly as the site has trash containers distributed throughout the entire parking lot. The Environmental Services blue recycling trailer is available but is hidden at the back of the site. This site does not produce a lot of actual recycling and needs much more attention. Only two student volunteers are dedicated to this site and arrive much later during the tailgating time as they walk down from the Farmer's Market. These volunteers distribute the blue recycling bags to tailgaters. This site suffers from a reduced number of student volunteers monitoring the site, the delayed time they arrived at the site, and the lack of a properly labeled recycling trailer. Overall, many less people were found recycling and using the blue recycling bags at the Fairgrounds site than at the Farmer's Market site.

In general, we identified that many of the blue recycling bags were used for trash in reality at both sites. While on site, we interviewed a couple tailgating fans. They noted that they were not aware of the materials they could recycle and were not sure what to do with the blue recycling bag after they were done tailgating.

Environmental Services Truck

The Environmental Services pick-up truck with the hitched blue trailer is driven by two volunteers and picks up the blue recycling bags at both the Farmer's Market and Fairgrounds site. A paper sign is duct taped to the recycling trailer denoting what should go into the trailer. The truck arrives on site at 2:30pm and leaves around 4pm after all the bags are collected. Both the driver and the passenger volunteers participate in the collection of recyclables. The truck stops at various locations throughout the parking lot so the volunteers can collect and load the blue recycling bags into the trailer. The volunteers often interact with the tailgaters educating them about recycling and accepted materials. Many tailgaters request additional recycling bags and note that they are not finished using their recycling bags by the time the truck arrives for collection. In these cases, the volunteers instruct the tailgaters to take their recyclables to the Sonoco Recycling trailer (if they are at the Farmer's Market site).

WILLIAMS-BRICE STADIUM

Recycling at the stadium is identified at the gate, but not necessarily front and center through-out the stadium. When you enter the stadium our staff noticed the distribution of trash cans and rolling recycling carts located at every gate. It is noted that the correct organization of a trash can and recycling cart are placed together at each gate. The recycling carts have a lid and are slotted for bottles/cans. As we observed the trash cans and recycling bins, we noticed a lot of plastic bottles and aluminum cans in the trash. When looking into many of the recycling carts, we found very little material. Our staff identified the following observations.

- At all the gates, the recycling carts were located behind the trash cans making the trash can the first container you see and therefore making it the first container for depositing your waste items
- Both the trash cans and recycling carts are black in color allowing them to blend into each other and not creating enough differentiation
- Both the trash cans and recycling carts have a similar style label which again allows them to blend into each other. Little differentiation is found between them
- If the recycling carts were a different color or at least labeled with a different label, these carts would stand out more differentiating them more from the trash cans

As you walk through the stadium concourse, the clear stream recycling frames with green plastic bags are scattered around the parameter. Most of these containers are not associated with a trash container and do not seem to be located within high traffic areas. Very few of these containers are being used for recyclables during the game. The stadium suites have specialized football helmet containers for plastic bottle/aluminum can recycling and have blue recycling containers for paper. Unfortunately, the specialized football helmet recycling containers are located at the entrance of the suite and not inside the suite where most of the recycling is being generated.

As with most stadium venue locations, most of the recyclables generated within the stands stay there after the game. Immediately after the game, a crew comes in to gather all of the recyclable plastic bottles and place them into green plastic bags for recycling. The rest of the waste clean-up occurs the day after the game is complete.

Around the stadium vendor areas, cardboard can be found mixed with bags of trash. John Deere Gators come around with trailers to pick up this material for disposal. It was not clear from our walk through assessment if the cardboard is actually recycled or placed in the trash compactor or open top roll-off containers as a waste material. Our staff believe that a significant amount of this cardboard is making its way into the trash after observing several of the open dumpsters.

Organization of trash and recycling containers at the stadium gates

Recyclables and trash left in the stands after the game

Student volunteers assisting with tailgating recycling

Student volunteers assisting with tailgating recycling

Cardboard left by vendors

Cardboard left by vendors

GENERAL RECOMMENDATIONS

The partnership with the Athletics Department and Environmental Services Department could be more fully maximized through the following shared goals.

- Create a highly visible recycling program
- Design a program that is easy for students and other football fans
- Develop a uniform and consistent look, feel, brand and messaging with the program – visible at both the tailgating areas and within the stadium
- Create a dynamic and succinct education and outreach campaign
- Encourage the maximum level of waste diversion and recycling

TAILGATING AREAS

Our staff would like to commend USC for addressing the recycling issues that occur in tailgating areas. Many universities only deal with the recycling issues that occur within the athletic stadium and designate all materials generated in the tailgate areas as trash. We have outlined our preliminary recommendations below.

- Designate waste and recycling areas throughout both of the tailgating sites. These sites would contain a trash can and a differentiated recycling container. Both containers should be well labeled, ideally different colors and the recycling container should have a lid/slot for beverage containers. The site should also have a sign designating it as a waste and recycling area outlining specifically what should go into the recycling container.

- Each car that enters the tailgate should be given two bags – colored bag for trash and the clear blue plastic bag for recycling. A sign/recycling guidelines sheet should be stapled to the clear blue plastic bag so that tailgaters can identify what should go into that bag. The sign should also identify what fans should do with these bags once they leave the tailgating area.
    - Work with gate staff to facilitate the distribution of these bags
    - Student volunteers could also give these bags out right at the gate
    - Student volunteers to give these bags out to students/fans walking into the tailgate areas

- Trash and recycling bag dispensers should be set-up at the waste and recycling areas for fans to get additional trash and recycling bags.

- Additional volunteers/staff are needed at each site to pass out trash/recycling bags, educate fans on recycling, answer questions, maintain the waste and recycling areas and ensure that bags are collected and placed in the correct location.
    - To garner solid assistance at the tailgate areas, hire student staff to work the tailgating areas instead of relying on volunteers

- Volunteers/staff need to start at each tailgating venue at the same time – lots of time is lost as volunteers meet at the Farmer's Market and then travel to the Fairgrounds site.

- Evaluate using multiple dumpsters at both sides for the collection/storage of the plastic bottles and aluminum cans. As the clear plastic blue bags are collected they could be placed into the dumpsters at each site. After clean-up and collections occur at the tailgate areas and at the stadium, the Environmental Services front load truck could empty all of the dumpsters and take it directly to Sonoco for processing.

- Appropriate signage needs to be on both the Environmental Services pick-up truck and recycling trailers

- Work with the City of Columbia or Sonoco to provide collection containers for the glass beverage containers

- Education and messaging at these tailgate areas is essential.
    - Have "Cocky" the mascot participate in the tailgate recycling process and creating a presence about "this is what we do" on campus

WILLIAMS-BRICE STADIUM

Stadium recycling is essential to ensure a uniform message about recycling and sustainability is fulfilled and integrated campus-wide. Students need to be able to recycle where they live, study and play. We have outlined our preliminary recommendations below.

- Recycling containers within the stadium need to be a different color or at least labeled differently to designate them as recycling containers.

- Ensure that a recycling container is located next to each trash can is essential – making fans walk further or to another location to conduct their recycling is discouraging and allows for more recycling to end up in the trash.

- At the gates
    - Recycling containers need to be side-by-side to the trash containers or in front of the trash containers
    - Gate ticket collectors need to be educated on the recycling program and how they can tell fans to recycle their containers instead of throwing them in the trash

- Inside the concourse
    - Recycling containers need to be placed next to all trash containers especially in high traffic areas
    - Would recommend using something more sturdy than the clear stream wire frames
    - Make the recycling containers stand out with garnet red coloring and large catching text

- Move the football helmet recycling containers inside the suites for recycling. Ensure that they are properly labeled with what can go inside the containers
    - Find a way to collect the glass containers generated within the suites
    - Glass can be added to the glass from the tailgating areas for either the City or Sonoco

- Ensure that there is a compactor or several dumpsters at the stadium dedicated for cardboard
    - All vendors should be educated on the recycling program and how they can participate/prepare their materials
    - Collection staff need to know exactly where the cardboard compactor/dumpster is located so that when the cardboard is collected staff know exactly where to place it for recycling

- After paid student staff or volunteers leave the tailgating areas, they should move to the stadium to help facilitate the recycling on the concourse
    - Stadium can be broken up into zones and each group of students is responsible for maintaining their specific zones
    - Within the zone, these staff are responsible for removing contamination from recycling containers, removing recyclables from full containers and ensuring that the containers are maintained and in the correct location

- In game announcements about recycling and the recycling program would be highly beneficial.

- Developing a specific logo and message for Athletics would help brand the Athletics' recycling message and program.

- Leverage the strength of vendor partnerships to assist in purchasing collection containers, signage and disseminating the recycling message

- Work with the stadium vendors on purchasing more recyclable forms of packaging

FOOD WASTE COMPOSTING

CAMPUS FOOD WASTE AUDIT

The University of South Carolina (USC) contracted F&ME Consultants to conduct a food waste audit of the University's dinning and catering facilities. The project scope was divided between phase I and II.

- Phase 1 – Data collection, site visits and a desk audit in which existing data from college and university waste audits in the US and Canada were to used to extrapolate the food waste generation

- Phase 2 (optional) – Food waste audit in which all solid waste generated at a dining facility would be collected, sorted and weighed for one day to determine the quantity of food waste generated by that facility

Phase 1 of the study was completed, but it was determined that Phase 2 was not needed as there was sufficient data to determine the generation rate of food waste at USC.

USC's contract food service provider, Sodexo Inc. supplied the consulting team with 2008 data for each facility regarding dinning and catering facility number, types, operations and business volume. On March 30th the consulting team together with USC and Sodexo representatives conducted site visits of various dinning and catering facilities at the University. Site visits included discussion with Sodexo management, observation of food preparation, and review of waste management procedures, facilities, and equipment.

The consultants also reviewed food waste audits data conducted at universities and colleges in the U.S. and Canada and at non-academic businesses to develop waste generation factors for USC. Waste generation factors were developed for both pre and post-consumer food waste streams at the following five "all-you-can-eat" dining halls: Preston's, Bates Café, Top of Carolina, Roost Café, and the planned Honors College dining facility, and at the following four prepared-foods cafeterias: Grand Market Place, Patio Café, Gibbes Court, and Colloquium Café.

STUDY RESULTS

Data from numerous food waste audits conducted at other universities and colleges in the US and Canada along with data from food waste audits conducted at non-academic businesses, were reviewed to develop usable waste generation factors for the types of eating establishments found at USC. Waste generation factors were developed for both pre-consumer (kitchen prep) and post-consumer (plate scrapings) food waste streams at all five "all-you-can-eat" dining halls, four prepared food cafeterias and for several fast food facilities. The following food waste generation estimates were developed for the following type of campus facilities.

Type of Facility	Pre-Consumer Food Waste Generation Factor	Post-Consumer Food Waste Generation Factor
Dining Halls	0.228 (lbs./meal)	0.257 (lbs./meal)
Cafeterias	0.22 (lbs./meal)	
Fast Food Facilities	1.19 tons/employee/year 4,250 lbs./employee/year	

Utilizing the referenced data on food waste generation rates, F&ME believed that the quantity of pre- and post-consumer food waste generated on campus from dining and catering facilities was estimated at 410 tons per year.

OUR ANALYSIS – F&ME STUDY RESULTS

The total of 410 tons per year seems fairly reasonable given the size of the University and its food preparation options. It's worth noting that slightly more than half of this food waste material (211 tons per year) is generated at third party vendor establishments like Burger King, Chik-Fil-A, Pandinis and other such facilities. Therefore access to this stream of food in a form that is acceptable to the composter will require more than the usual cajoling and twisting of arms. The tonnages overall seem reasonable, however the actual accessibility of the food waste is likely to be far less than the total shown in the waste audit.

REFRESH PROPOSAL

In 2009, Refresh Services, a company that currently composts commercial organic wastes, submitted a proposal to the University to handle their food waste composting. Their proposal included providing carts at specific locations, transportation of food waste to their facility and covered the final composting of this waste. They proposed providing 35-gallon Rehrig Pacific carts at the following locations. Additionally they would take all yard wastes that were generated on campus.

Location	# of Carts	Service Level
Russell House	10	2 x week
Capstone & Bates	6	2 x week
Honors College	6	1 x week
In at USC	4	1 x week
McCutchen House	4	1 x week
National Advocacy Center	4	1 x week
Roost	3	1 x week

The company's in-vessel composting process uses the minimum amount of emissions to compost food and yard debris. Their composting process is aerobic and takes about five days. Refresh Services hauls food waste to a centralized site in Prosperity, South Carolina, 40 miles away from downtown Columbia. The facility's proximity to Columbia leads to fewer transportation emissions, lower gas costs, and quicker response times. The facility will be capable of handling over 35,000 pounds of organic residual every day. To ensure security and safety organic waste will be sealed in bagged sealable roll off carts and no vehicles will be stored on the University's property. GSP Model 500 or Park-Mor Side Loader trucks specially designed to haul organic waste and eliminate spillage will collect organic waste. Collection will occur Monday through Friday during normal business hours and pick up will take no more than seven minutes at any collection point regardless of whether dumpsters or roll carts are utilized. These vehicles will transport material from facilities where waste is produced to a composting facility.

The company will charge food residual $58 per ton or $23,200 for 400 tons of food residual. The price includes aggregation and treatment of food waste, composting process, and any carbon supplement required for composting. Food residual are all edible products as well as bones, napkins, shells, rinds, and biodegradable dinning. The price for yard debris composting is $47 per ton or $14,100 for 300 tons of yard debris. This includes the aggregation, treatment, processing, and mixing of debris as well as treatment and storage of final product. Refresh services charges a monthly fee per pickup site to cover pickup, transportation, handling, and security of organic waste at each site. Pickup charge per pickup site is $180, $1,620 for nine anticipated pickups, and

$19,440 per year. The company will provide 65 35-gallon roll carts for organic storage. Each 35-gallon cart will cost $40 for a total of $2,600 (The price of any unused cart will be refundable after a reasonable length of time.) The University will be entitled to any finished compost produced from its organic residual and can receive up to $10,000 worth of finished compost. Refresh Services accepts both yearly and monthly basis payment options. Total cost of a full line of services is $59,340 but the University can receive up to $10,000 worth of finished compost lowering the cost to $49,340.

Refresh Services provided the following financial proposal.

Service/Product	Price	Quantity	Bid Price
Food Waste Composting (per ton)	$58	400	$23,200
Yard Waste Composting (per ton)	$47	300	$14,100
Composting Price			**$37,300**
Monthly Charge per Pick-up Site	$190	9	$20,520
Containers	$40	65	$2,600
Total Price for Service			**$60,420**
Returned Compost Value (per ton)	$25	400	($10,000)
Cost of Composting to USC			**$50,420**

OUR ANALYSIS – REFRESH PROPOSAL

Some of our specific observations are as follows:

- The number of carts and the number of pulls together seem to be low. For instance USC will get twice per week pulls at some of the larger generation sites. Our experience with other universities suggests that even when the pulls are 3 times per week that the carts need to be refrigerated in order to stop odor problems. This will likely be a bigger problem in South Carolina because of warmer year-round temperatures.

- Some approaches to mitigate odor problems could include the specific inclusion of paper towels and other compostable papers to soak up liquid and preserve aeration. In addition in some locations sealed dumpsters might work as a means of containing food wastes and their odors.

- The current proposal calls for the delivery of yard waste to the in-vessel system. This will no doubt be a more costly option than simply composting this stream of material in a manner that is less capitally intensive.

- The proposed tip fees for food waste composting $58/ton seem quite reasonable and perhaps even on the low side. The proposed tip fees for yard waste at $47/ton are too high.

- $190/pull per location per month seems like a good price.

COMPOST FACILITIES IN THE AREA

City of Columbia Compost: Columbia, SC
This compost site is located very close to USC in Columbia, South Carolina. It receives 25% of the city's total trash tonnage in organics. Compost made here is available to the public.

Wellford Landfill Composting Site: Columbia, SC
The Wellford Landfill Composting Site is operated by Spartanburg County. It composts about 310 tons each year of organic waste. The site also handles about 35 tons per year of MSW with a tip fee of $44 per ton. This compost site is in Columbia, nearly right next door to USC.

Lower Richland Drop-Off Site: Eastover, SC
The Lower Richland Drop off Site for compost is about 25 miles from USC. Materials that are free to dispose here are: yard waste, furniture, tires, glass, aluminum cans, plastics #1-7, newspaper, magazines, cardboard, scrap metal, electronics and motor oil.

Refresh Services: Lexington, SC
Refresh Services is an in-vessel composting company, which also has a compost yard. This facility is about 14 miles from USC. Claims in-vessel units compost in only 7 days, after which compost is produced that can be used in landscaping, farming, wetlands reclamation, erosion control, etc. Refresh Services offers environmental, sustainability and waste reduction consulting services in addition to composting; a "storage bin" is held at the source of organic waste and Refresh picks up the material, and composts it at their facility.

RECOMMENDATIONS

- An organics diversion program is strongly encouraged – could be initially conducted through a pilot program
- The Refresh Services proposal is strong and could provide an easy material sourcing location for organics.
- Recognize that initially the tonnage will be far less than 400 tons per year and see if they are willing to still offer you the same unit costs as USC works into the program.
- Run some collection pilots to figure out best practices around managing this material and program.
- Work with purchasing to build in opportunities to eliminate single serve foods, creamers, and all for the other food waste based packaging that will contaminate the composting process. This will require work on the university side and be quite difficult with the outside vendors.

EDUCATION AND BRANDING

Program branding and education is essential for any successful waste reduction and recycling program. This branding and education needs to be uniform across campus so no matter if you are in an academic building, living in a residence hall or visiting a sporting venue, students and staff know exactly what the recycling containers look like, where they are located and what goes into the container for recycling. USC has spent a significant amount of money creating an infrastructure around recycling. From recycling containers to recycling dumpsters to service vehicles to staff that service these containers, it is all part of the recycling equation. It is now time for USC to fully maximize this infrastructure to get the biggest bang for your recycling dollars. It all begins with education.

CURRENT CONTAINERS AND SIGNAGE

Currently, the University does not have a unified campus-wide approach making recycling happen. The Environmental Services Department has definitely spent time placing recycling containers on campus, unfortunately the approach has not been uniform with containers or signage. There is no area on campus that shouts "RECYCLE HERE". Most of the recycling infrastructure blends in with the campus environment, is not well labeled and does not designate all materials that could be recycled. Additionally, there does not seem to be clear understanding about what types of materials can actually be recycled on campus.

Below are the current examples of recycling containers on campus. With each building having a different set-up and set of containers, program uniformity does not exist. The labels that are affixed on the recycling containers do not fully describe the materials that can be placed inside, so there are missed opportunities for material capture.

Waste Warrior Multi-Sort Bins – used for plastic bottles, cans, office papers and newspapers

Blue Rolling Carts – used for a source separated material normally office paper or newspapers. Can be used for bottles/cans at some loading docks

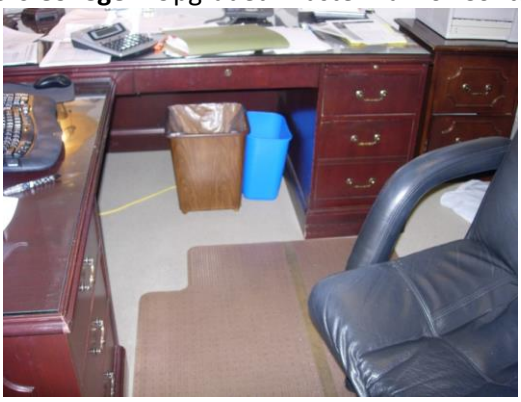
Blue Rubbermaid Bins – used in offices under the printers for office paper (some areas also use them for bottles/cans)

Blue Slim Jims – used for source separated materials – normally bottles/cans, office paper, or newspapers

Not uncommon to see sites similar to this

Honors College – Upgraded Waste Warrior Container

Majority of Residence Hall Collection Containers (Blue Rubbermaid Bins)



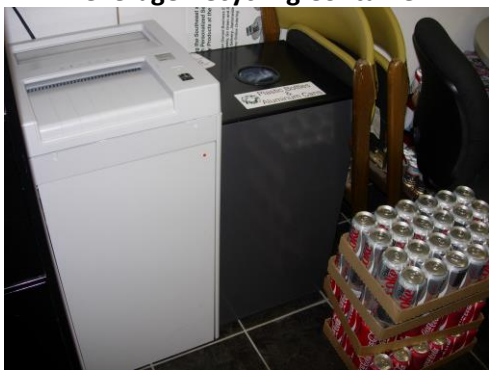
Office Recycling Containers – At Desk Bin

Gray Tip Cart – used for the collection of cardboard

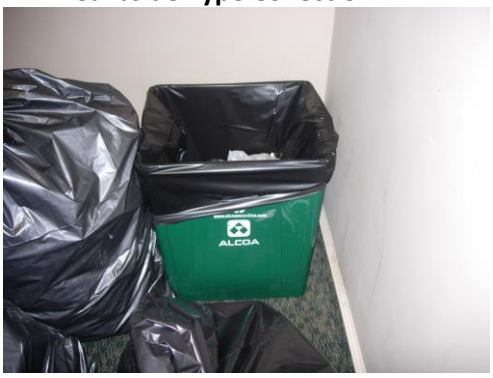
Old Style Waste Warriors – found in Coker

Beverage Recycling Container

Curbside Type Collection Bin



Bottle/Can Recycling Container – located in office building

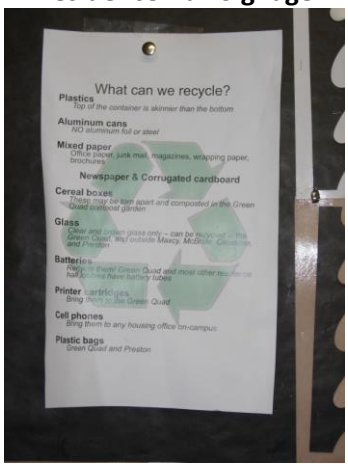


Alcoa Bottle/Can Recycling Container – located in many residence halls

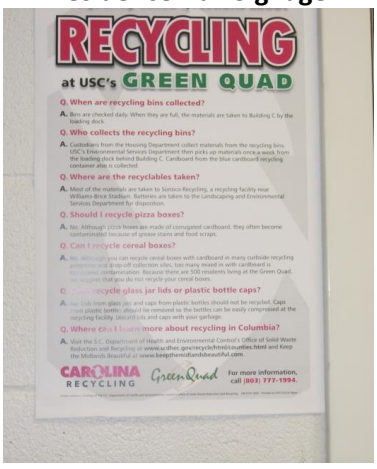
Below are some examples of the recycling signage on campus. With each building having a different way of promoting the materials that can be recycled, uniformity of program education also does not exist. For the most part, very little signage is associated with recycling and/or recycling containers located in office and academic buildings. Most of the signage found was associated with the residence halls. Most of the signage was small, had too many words, was not uniform across the residence halls and did not stand out as a recycling sign.

Residence Hall Signage

Residence Hall Signage



Residence Hall Signage



Residence Hall Signage

Public Health Building (one of the only buildings that had signage up near the recycling)

EDUCATION AND OUTREACH CHALLENGES

After our walk through assessments were completed on campus, our staff outlined the following key issues and barriers that are affecting the effectiveness of the recycling program for the Environmental Services Department.

- Diverse set of collection containers throughout campus and residence halls
- Much of the collection of materials is source separated – specific materials have to go into specific recycling containers. A single stream system would be much easier for students and staff to participate in the program.

- Culture of students – majority of students attending USC come from instate
    - South Carolina does not have a lot of curbside recycling or supplemental recycling occurring throughout the state
    - Students have not practiced it at home, so it is not part of their culture coming to USC

- Lack of information – it is hard to find information about recycling on campus. Lack of signage and website does not house a lot of information

- Lack of consistent messaging – the way recyclable materials are collected on campus is different from how they are collected in residence halls. Different containers and signage.

- Lack of centralized collection points/recycling containers in high traffic areas – recycling containers are not located next to trash cans so in general it is not convenient to recycle. Recycling containers are often not in high traffic areas and it is challenging to find centralized collection points in many of the office/academic buildings.

- Disconnect between Carolina Recycling (education and outreach) and Gamecock Waste (infrastructure and operations)

EFFECTIVE BRANDING

Anyone working in an office or living in a residence hall needs to sense that recycling is an expected part of campus life. This needs to be established when students arrive on campus in the fall and be reinforced through peer and supervisory reminders throughout the year. In the residence halls, RAs and EcoReps can play a large role in encouraging and monitoring recycling efforts. In offices, recycling success rate and quality needs to be regularly brought up at department level meetings and building level facility management meetings.
RRS recommends that USC recycling program develop a clear brand for its program. A brand is a collection of experiences and associations connected with a service, person or entity. Brands are not only a logo, but a look and feel of a program that create customers and maintain those customers, or in this case, users.

The objectives that a good brand will achieve include:

- Delivers the message clearly
- Confirms your credibility
- Connects your target prospects emotionally
- Motivates the user
- Develops user loyalty

For USC, creating a brand should focus on several key areas:

- **Creating a consistent logo and look to campus recycling materials.** Consider how the program is currently identified around campus. Does the logo define the program? Are the materials produced for campus recycling consistent in their use of font and color scheme? How do people recognize recycling on campus? Your goal is to create a program that when all these components are working together, users (whether students, faculty, or staff) see them, they will instantly recognize your program.

- **Creating clear, concise and consistent messages about the program and what you want the user to do.** Overall there is no message about recycling on campus. In general there is very little information about recycling on the Facilities, Sustainable Carolina and University Housing websites. Since the majority of students and staff looking for information about recycling would look at one of these sites, very little information would be found. A brief visit to the USC Facilities Operations and Maintenance website reveals no message about campus recycling, just a list of materials that can be recycled on campus. A visit to the Sustainable Carolina's recycling page reveals a slight message of sustainability and associated links to get more information about recycling on campus. A visit to the University Housing page on recycling, again does not display a message about recycling, just an overview of what can be recycled, the move-in and move-out programs as well as FAQ's.

  Not only does the message need to be clear, but it needs to be simple. Too many messages can lessen the impact of all the important information that needs to be displayed.

- **Update publications and materials.** Even for recycling programs, graphics need to catch the eye of users. Clip art is easy to use and usually less expensive, but photographs or colorful graphics are the trend in recycling communications. As USC looks to make changes to their recycling program, it is a great opportunity to not only create new materials, but refresh current recycling materials. Universities provide a wealth of creativity and low cost production through students and their skills.

Branding is then one component of a larger communications and education effort about the program. The job of communications is never done, and must be ongoing throughout the entire year. Using different types of venues and medias to convey your recycling message is key. Some get their information from print materials, Facebook, websites, Twitter, campus TV and others from posters and kiosks on campus.

EFFECTIVE MESSAGING AND OUTREACH

As USC looks to develop effective messaging and market their recycling and waste services throughout the University the following steps should be considered in phases so that the Department is recognized as the waste and recycling resource throughout the campus.

- **Phase 1 – Information Gathering**
  A lot of this work has been completed through our analysis. Some components still need to be defined and shared with the entire Environmental Services Department.

  - Full understanding of all services provided by the Department

  - Carolina Recycling and Gamecock Waste need to address the following in a succinct, uniform and campus-wide way
    - Recycling guidelines
      - Identify what is recyclable and where/how do you recycle it on campus?
      - Review and update these guidelines as necessary with processing contract

- Recycling supplies
    - Identify current set of recycling containers
    - What types of containers would be more beneficial for students and staff to use?
    - What types of containers would be more beneficial for Department staff to handle and transport?
    - Are recycling containers in the right locations?
    - How can student, faculty and staff request a recycling container?
- Collection
    - Equipment - Does the Department have the right equipment to service the locations efficiently?
    - Traffic Patterns - Does the location of the recycling containers match up with the building type and student/staff/faculty traffic patterns
    - Frequency – Does the frequency of recycling container collection service adequately fit the building and type of container?
    - Interviews – Talk with students and building staff – is the Department hitting the mark with their services?
- Handling
    - Internal Campus
        - Where do the recyclables go?
        - Is it clear to staff and students?
        - Who services/empties these containers?
    - External Campus
        - Where do the recyclables go?
        - Is it clear to collection staff where materials should be put for collection or storage?
        - Is it clear to collection staff when the Departments recycling routes occur?

- Identify and inventory all materials used by the Department, both internally and externally. Identify where and how these items are currently used. Also identify where and how these items could be used in the future.
    - Websites
    - Social media
    - Signage
    - Recycling container labels
    - Recycling guidelines and instructions
    - Recycling containers
    - Other

- Review of services and materials
  - What does the Department do?
  - What are the gaps in collection and service?
    - What is the Department supposed to be completing and currently are not?
    - Who is currently filling these gaps?
  - How does the Department promote themselves?
    - What does the campus see?
    - Is everything consistent?
    - Ideally a survey of students, staff and faculty could be conducted to get feedback
  - How can someone reach the Department for services and/or resources?

- **Develop Phase 1 Marketing Plan (based on evaluation of information and recommendations)**
  - Develop consistent brand
    - All services should be under the same brand (both Carolina Recycling and Gamecock Waste)
    - Determine a name, look and feel
    - Develop the necessary materials for this branding

  - Make decisions on key issues
    - Entity that will be doing the recycling processing
    - Based on processing decision – determine how materials are collected on campus
    - Based on processing decision - identify the types of containers to be used

  - Update old materials and develop new ones
    - Update labels for recycling containers – attach to recycling containers
    - Update current websites
    - Create signage on campus
    - Reach out and survey current participants of your program as well as attracting new ones

  - Promote!
    - Sell your Department and services (especially to Auxiliary units)
    - Identify ways to sell themselves and services
    - What collaborations can be made with other campus entities (Housing, Office of Sustainability)

  - Test materials
    - Put your new materials out there for students, staff and faculty to use and review

  - Feedback on materials
    - Survey students, staff and faculty on your new materials and program changes

- **Phase 2 – Targeting Your Audiences and Changing Behavior**
    - Now that the department has a solid understanding of your services and are promoting yourselves properly, it is time to change behavior and increase positive participation across campus using your services.

    - *Understanding your audience*
        - To drive behavior change, different audiences will need to be surveyed to better understand current behaviors and attitudes towards waste and recycling.
        - Identify groups that could assist with surveying students, faculty and staff on behaviors and attitudes about waste and recycling.
        - Use these results to develop Phase 2 Marketing Plan

    - *Understanding other messages that are out there*
        - There are lots of groups and other departments that all have an interest in recycling.
            - Housing
            - Student groups
            - Administration level groups
        - Bring them to the table
        - Work on a unified message
        - Make Carolina Recycling THE entity that manages waste and recycling and that they should be the only source of this information.
        - Build partnerships and alliances

- **Phase #3 – Final Marketing Plan and Implementation**
    - After the additional fact finding and interviews, develop a final marketing plan addressing each of the criteria listed above

- **Phase #4 – Reevaluation and Examination**
    - The process never ends
    - Put into place checks and measures of program success
    - Update messaging from year to year
    - Survey students from year to year so that audience is understood

As you look for ideas on how to spread the recycling message across campus, here are some target groups and suggested activities to consider promoting recycling activities on campus.

- **All Users**

    - *Create consistent signage that includes the clear message and updated look from brand management.* Make sure inside bins and containers, outdoor collection units, are properly labeled; provide signage above containers to direct users to place materials in the appropriate one. This will help users recycle properly and help ease collection for building service staff.

- *Update all websites* – All websites that house information about recycling – Facilities and Maintenance, Sustainable Carolina and University Housing – should be updated with the logos, branding, messaging and same information. No matter which site is chosen by students or staff, the information should be uniform.

- **Faculty/Staff Education.** The following is a list of approaches to consider when targeting faculty and staff.

  - *Tabling events in each building*: table in building lobby with recycling information, giveaways, etc.

  - *Brown bag lunch presentations:* schedule lunch meetings and provide a presentation to each department to review recycling program.

  - *Competition between buildings:* consider faculty challenges in addition to student challenges.

  - *Faculty emails or newsletters:* fun facts, tid-bits and reminders to staff.

  - *Random visits to departments to check on recycling:* continue the education process by providing feedback after you have provided the "how to" guidelines on recycling. A simple program like "Caught Green Handed" program can provide a buzz around the program. Staff or departments can be recognized for their waste reduction/recycling efforts. This recognition will generate continued support and behavior changes of your users.

  - *Faculty/staff involvement on campus "green team" or other organization.* Involve all levels of the university in a group about recycling. Create department contacts or "environmental stewards" whose duties are to be the resource for their department and liaison with the Environmental Services Department.

- **New Student Education.** New students are new users to your program. The following are a couple of recommendations to target new students.

  - *Recycling training part of new student orientation*. Welcoming students to their new home should include how to participate in the recycling program.

  - *Fully promote and encourage EcoReps to be the "green" person in each building and to assist in monitoring the program*. The EcoReps should be your recycling program's messengers and monitors across the residence halls. The EcoReps should create and facilitate a green team for each residence hall and facilitate a larger campus-wide group that includes students and staff.

  - *Green Kick-off Event.* Many schools host welcome events for new and returning students. Consider making it a "green" or zero-waste event to capture all students and refresh their recycling knowledge to start the school year.

SUPPLEMENTAL INFORMATION

REGIONALLY AVAILABLE RECYCLING & LANDFILL FACILITIES

SINGLE STREAM RECYCLING FACILITIES

One of the strongest trends in recycling now is the move to single stream. This form of collection combines all recyclables into one container, including office paper, newspaper, cereal boxes, plastics, metals, and glass. Single stream collection simplifies the program for all participants in the recycling program including the users, custodial staff and haulers.

Facilities that USC could either processing materials at directly or transfer materials for processing are described below.

Paper Stock Dealer / Columbia MRF and Transfer Station: Columbia, SC
Paper Stock Dealer / Columbia MRF Transfer Station is only about 2 miles from USC. This Transfer Station is privately owned and operated by Paper Stock Dealers, Inc. and processes about 4,000 tons of recyclables each year. The MRF is only about 4 miles from USC. It is also privately owned and operated by Paper Stock Dealers, Inc. and processes about 500 tons per day of dual stream recyclables. This facility handles cardboard for Wal-Marts in the surrounding counties.

FCR MRF: Charlotte, NC
The Mecklenburg County Recovery Facility is owned by Mecklenburg County, but operated by FCR, Inc. The MRF processes a little more than 300 tons per day of single stream materials. The FCR facility does have limitations on their ability to provide revenue share due to their operating agreement with Mecklenburg County. This facility is 95 miles from USC. Single stream material would need to be consolidated at a transfer facility to be loaded into large 120cy transfer trailers.

Sonoco MRF: Charlotte, NC
The Sonoco facility processes over 100 tons of material per day. The Sonoco facility is sourcing single stream material from outside of Charlotte already. The facility is around 100 miles away. Single stream material would need to be consolidated at a transfer facility to be loaded into large 120cy transfer trailers.

Henderson County MRF: Hendersonville, NC
The MRF located in Hendersonville, NC will have both dual stream and single stream capabilities. It has not opened yet, but is expected to in July 2011 and will be operated by American Recycling. It is located about 140 miles from USC.

Greenwood County MRF: Greenwood, SC
Greenwood County MRF is owned and operated by the County. The facility processes about 10 tons of materials each day including cartons, which are currently being collected for recycling. In addition to this MRF, the county also owns and operates a landfill, compost and Construction and Demolition disposal site. This MRF is located about 75 miles from USC.

York County MRF: York, SC
This facility is located about 80 miles from USC. Some of the materials that can be recycled here include: newspaper, office paper, used motor oil and oil filters, textiles, cardboard, scrap metal, tires, batteries, paint, vinyl siding, books, plastics (#1-7), aluminum cans, magazines and catalogs and live Christmas trees will be accepted through January 31.

The following material recovery facilities are 100 miles or more away from USC. All of these options would require a transfer option in addition to a processing contract.

Charleston County MRF: Charleston, SC
This MRF is owned by Charleston County, but operated by American Recycling of South Carolina (ARSC). This MRF is also dual stream, but currently running a pilot program with single stream collection. Among the accepted recyclable materials include: corrugated cardboard, electronics and used motor oil and oil filters. This facility also offers bins. This MRF is just over 100 miles away from USC.

American Recycling of South Carolina MRF: Greenville, SC
This MRF is operated by American Recycling of South Carolina as a dual stream MRF. It does receive some bagged single stream materials, which the MRF de-bags and ships the materials to a nearby single stream MRF. This facility is located about 100 miles from USC.

Horry County Solid Waste Authority MRF: Conway, SC
Horry County owns and operates the Horry County Solid Waste Authority MRF. This facility was recently moved from Myrtle Beach to Conway, South Carolina and began operations in Conway in 2007. The Material Recovery Facility processes about 75 tons per day of materials. The curbside areas contributing to the tonnage of this MRF will be switching to single stream collection, however the local drop-offs will remain as source-separated collections. The MRF has specifically been oversized to accommodate the expected population growth in the area. The building will be "green" and a showcase to other MRFs in several ways: it is heated by landfill gas, uses flooring made of recycled pallets and has counters made of recycled products. This facility is about 130 miles from USC.

Pratt industries MRF: Savannah, GA
The Pratt Industries MRF in Savannah, Georgia is about 160 miles from USC.

LANDFILL FACILITIES

Richland County Landfill: Columbia, SC
A much smaller landfill in the area, Richland County Landfill, primarily accepts Construction and Demolition wastes. The facility averages 250 tons per day and is owned and operated by the county. This landfill is located in Columbia, NC about 7 miles from USC.

Carolina Concrete & Asphalt Recycling, Inc. Transfer: Columbia, SC
The Carolina Concrete & Asphalt Recycling Transfer Station is about 14 miles from USC. It is privately owned by Carolina Concrete & Asphalt Recycling, Inc. and processes 40,000 tons of Construction and Demolition waste along with 3,700 tons of recyclables on average each year.

Lexington County Landfill & Transfer Station: Lexington, SC
A publicly owned landfill, Lexington County Landfill & Transfer Station, is located only about 15 miles from USC. Owned and operated by Lexington County, this landfill receives about 800 tons per day and charges a tip fee of about $39. This landfill was opened in 1993.

Richland Landfill (aka Screaming Eagle Road Landfill): Elgin, SC
The Richland Landfill is owned and operated by Waste Management, Inc. It processes about 2,000 tons per day of MSW and has been in operation since 1978. This facility is less than 20 miles from USC and the tip fee here is about $33.

TNT Sands Landfill: Elgin, SC
Waste Management owns and operates another landfill in Elgin, South Carolina, which is about 20 miles from USC. This landfill primarily accepts Construction and Demolition waste at about $30 per ton.

Northeast Sanitary Landfill, Inc: Eastover, SC
Northeast Sanitary Landfill is owned and operated by Allied Waste. It processes about 75 tons per day and charges $21 per ton for their tip fee. This facility opened in 1991. It is located in Eastover, South Carolina; about 30 miles from USC.

Lee County Landfill: Bishopville, SC
This landfill in Lee County is owned and operated by Allied Waste. Lee County Landfill also has a process throughput of about 3,500 tons per day of MSW. This facility is less than 40 miles from USC and the tip fee here is about $35.

Oakridge Landfill, Inc: Dorchester, SC
The Oakridge Landfill is also owned and operated by Waste Management, Inc. This landfill is slightly smaller than the Richland Landfill, but still processes about 2,000 tons per day of MSW. This facility has been in operation since 1987. It is located about 80 miles from USC and the tip fee here is about $44.

Augusta Richmond County Solid Waste Facility: Blythe, GA
The Augusta Richmond County Solid Waste Facility is less than 90 miles away from USC. This facility brings in just less than 1,000 tons per day of MSW at $32.50 per ton. It is owned by the City of Augusta and operated by Richmond County. The landfill was opened in 1980.

The following landfills are 100 miles or more away from USC. All of these options would require a transfer option in addition to a disposal contract.

Pepperhill Development Company Landfill: Charleston, SC
The Pepperhill Development Company Landfill is owned and operated by Republic Services. The landfill is located about 100 miles away from USC and the tip fee here is about $29. This facility brings in about 4,000 tons per year of MSW and about 2,000 tons of Construction and Demolition waste.

Anderson Regional Landfill: Anderson, SC
The Anderson Regional Landfill is owned and operated by Allied Waste and processes just over 1,100 tons per day of MSW. The tip fee here is about $37 per ton and the facility is located just over 100 miles from USC. Anderson Regional Landfill was opened in 1973.

Charlotte Motor Speedway Landfill: Concord, NC
The Charlotte Motor Speedway Landfill is owned and operated by Browning-Ferris Industries. The landfill brings in about 3,500 tons per day of MSW and has been in operation since 1983. This is just over 100 miles from USC. The landfill tip fee here is about $30.

Facilities Surrounding University of South Carolina

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05/02/2011

Facilities Surrounding University of South Carolina

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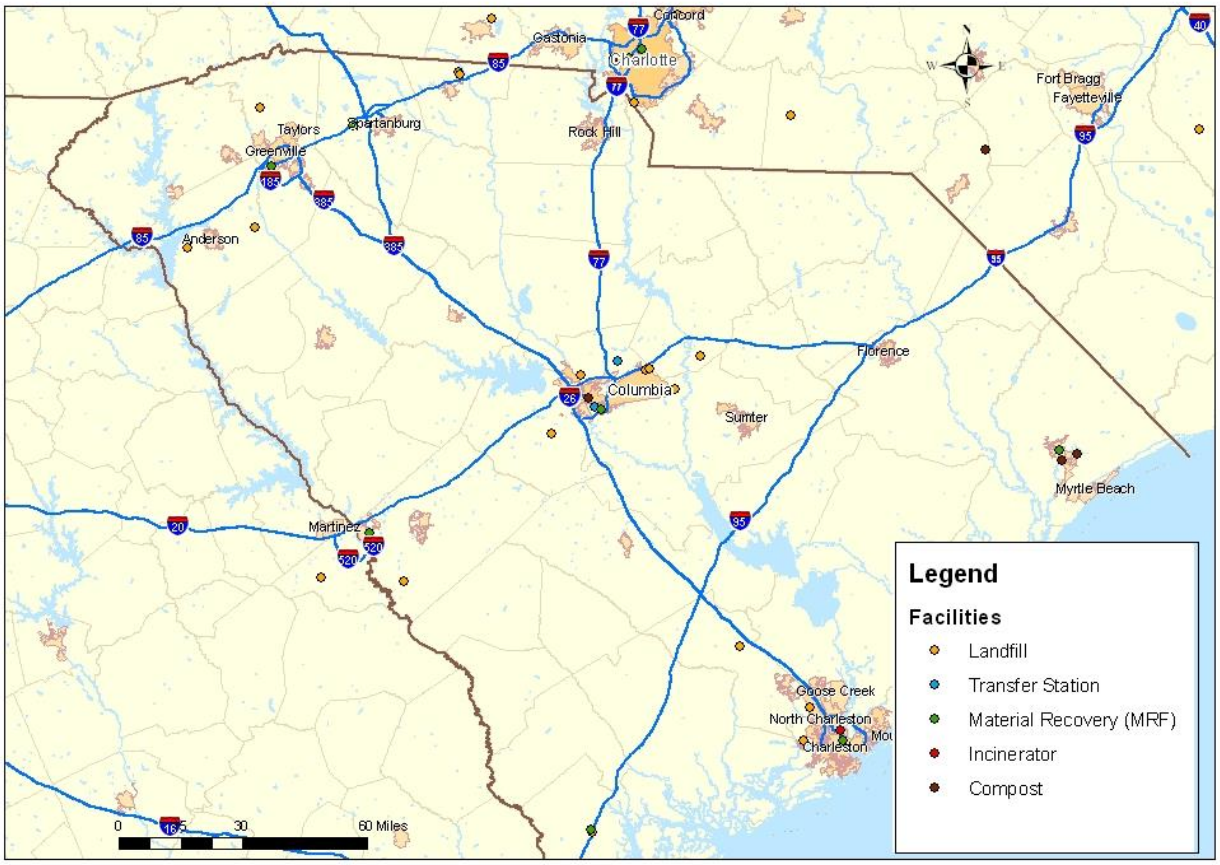

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BEST PRACTICES FROM OTHER UNIVERSITIES

As we look to expand the University of South Carolina's recycling and waste reduction programs, it is best to look at the methods that other universities are using to achieve this goal. Below we have outlined some top performing universities as well as universities that are located within the SEC.

ACADEMIC OFFICE RECYCLING

HARVARD UNIVERSITY'S 'GREEN OFFICE PROGRAM'

The Green Office Program's offers staff practical solutions needed to meet Harvard's greenhouse gas (GHG) reduction goal and fulfill our Sustainability Principles, and a fun, competitive way for offices to celebrate their accomplishments. The program is structured around 4 levels of sustainability certification—Leaf One, Two, Three and Four—in 9 categories: Energy, Events & Meetings, Kitchens, Outreach, Publications, Purchasing, Recycling, Transportation, and Waste Reduction. Upon attaining the first level, an office is recognized as a Harvard Green Office, and can build upon that success to earn a higher 'Leaf'. The Green Office website provides a host of tools and resources toward achieving Leaf certification including a PowerPoint presentation and checklist for each level, and fact sheets on topics such as green purchasing and computer power management. So far, 59 offices are certified in the Green Office Program.

RESIDENCE HALL RECYCLING

RESIDENTIAL RECYCLING PROGRAM AT IOWA STATE UNIVERSITY

Iowa State University has a residence-wide recycling program with students at the helm running the program. The GreenHouse Group (GHG) is a club that is devoted to keeping the program running and finding new students to continue the program along with getting involved in other sustainability projects. Students within the residence halls are now able to learn how to recycling and have an opportunity to become leaders through the program. In one month alone in 2009, over 1,800 pounds was recycled through a trial program. Over 1,400 pounds were recycled in 2009 at one residence hall alone.

Here are some of the program highlights that made the program a success.

- Blue recycling bins were purchased for 130 houses and two residence halls
- A bid was written for a company to provide the outdoor containers and material removal service. The bid was awarded to Waste Management of Iowa
- The first "Recycling Handbook" was written and distributed throughout the Housing Department (student chairs, Community Advisors/Resident Managers, Residential Life staff and Facilities staff)
- Signage was made for all residence hall communities
- Recycling and sustainability was discussed during training with all full-time Residential Life staff, Community Advisors and Resident Mangers
- Used a move-in theme of 'Welcome to Your Green Cyclone Home', had welcome banners with this message and bulletin boards taking about the new recycling program
- All full time and student staff wore shirts at move-in with the 'Welcome to Your Green Cyclone Home' theme

STUDENT UNION WASTE REDUCTION

DECREASING WASTE AT IOWA STATE UNIVERSITY (ISU)

ISU Dining has been actively expanding efforts in waste reduction, recycling, and composting. ISU dining's waste reduction efforts include recycling cardboard, pallets, white paper and decreasing disposable cup waste. A comprehensive food waste program has been expanded from composting pre and post consumer waste, to going trayless in all three residential facilities and will include donating retail leftover food to a local soup kitchen.

Iowa State University employs a variety of ways to reduce wastes within their student unions. Below are some of the highlighted avenues that they have taken as they relate to recycling, composting and waste reduction.

Recycling

- All cardboard is flattened at the different dock locations, picked up and brought to food stores where it is sorted to make sure it gets recycled.
- ISU rewards Dining Services with $2 for every pallet that is collected and recycled at the union. These pallets are transported back to food stores for recycling.

Composting

ISU Dining partnered with Facilities Planning and Management, ISU Compost Facility and the Department of Residence to start the composting program. In order to accommodate the amount of food waste being composted, ISU Dining purchased compost dumpsters, trash bins for transporting the food waste, pulpers and a platform for staff to be able to stand on when emptying bins. A pick up schedule appropriate to the amount of food waste being produced was developed and staff members were trained in compost handling. As the program got underway, it was determined that a pulper, which would remove excess water from the food waste, would decrease the weight of the food sent to the facility and make the food easier to compost.

A Live Green Revolving Fund of $45,000 was allotted to the compost program by the campus Green Team to support the program. From August 19 to November 30, 2009, 120.22 tons of dining waste was composted. Economically, charges from the City of Ames from $800 to $1200 per month were being incurred in order to treat the water from the dining centers. By implementing composting of food waste, the water is cleaner and doesn't have to be treated to the extent it did before composting. ISU Dining no longer pays the water treatment fees thanks to the composting program and the savings go toward the Live Green revolving fund savings.

Once the food wastes transformation into compost is complete, ISU is able to use the finished compost as a component to create good soil around new and existing campus buildings. This in turn decreases the need for chemical fertilizers and pesticides. With the food waste out of the water, eliminating fees incurred from the City of Ames to treat ISU Dining's waste water proved to be both an economically and environmentally obtainable goal.

Waste Reduction

- *Disposable cups*: ISU Dining started offering a meal discount initially to decrease the number of disposable cups used on campus (0.5 million in 2009). Students were only allowed to use the discount when they used the ISU reusable tumbler. To market the discount more effectively, the policy was changed to allow any reusable tumbler to be used with the discount in order to put an emphasis on reducing cup waste instead of reusable tumbler type.

The marketing campaign materials entailed posters and table tents, buttons for staff, an article in the student newspaper, Facebook, Twitter, ISU dining website, and Earth Week special. Mechanically, on registers in all centers there was a button added devoted to the discount and student workers were trained when to used it. Reusable tumblers with an ISU dining logo were made available for purchase at some locations.

The discount and marketing material was funded by ISU Dining Services. The student discount was 35 cents to encourage students to feel that it was worth bringing their own tumbler each time.

- *Trayless:* Going trayless was originally intended to help reduce food waste but it also helped save resources in water, energy and cleaning supplies. Trayless implementation was a relatively simple process. Logistically, every dining center was assessed to figure out the best way to change both customer and dishwashing lines to make them more efficient without trays. A year was spent on educating of students about the benefits of going trayless.

  The renovation of the dining centers allowed ISU dining to plan the layout with going trayless in mind. When comparing Union Drive Marketplace, which is not trayless, and Seasons, which is trayless, the average food waste per person is significant. At Union Drive Marketplace the average pounds of waste per person is 0.36lb while at Seasons it is 0.22lbs.

STADIUM RECYCLING

FOLSOM STADIUM RECYCLING PROGRAM AT COLORADO UNIVERSITY (CU)

Over 80 percent of consumed materials at CU's stadium is either recycled or composted. Some of the detailed accomplishments include the enormous amounts of materials recovered for recycling or composting by removing public trash cans within the stadium. Approximately three tons of plastic bottles, plastic cups, and aluminum cans and an additional three tons of food and food service packaging were composted during several games. Importantly, upstream efforts to reduce waste generated less material than the average home game last season.

CU's private concession vendor, Centerplate Inc. has converted nearly all food and beverage containers in Folsom to recyclable or compostable materials. Boulder-based Eco-Products Inc. is furnishing the compostable servingware. This effort to "design for diversion" has been a major success so far. While there are still "rougue materials" like candy wrappers, almost all packaging within the stadium is now recoverable.

Recyclables and compostables are collected at 25 attended locations inside the stadium. Volunteers monitor the stations and advising patrons how to participate properly. After the game, ROTC units are assisting by separating all materials during stadium cleanup. Barrels and bags are sorted at CU's Intermediate Processing Facility (IPF) next to the Stadium. Recyclables are picked up by Eco-Cycle, one of the country's largest non-profit recyclers and an international leader in zero waste. Recyclables are further processed at Boulder County's publically-funded recycling facility and shipped to recycling mills.

Compostable food, paper, and bioplastics are collected in a specialized compaction truck purchased by CU's student government (UCSU) and delivered to Western Disposal's permitted composting facility in Boulder. This "industrial-strength" composting process enables food, meat and bones, soiled paper napkins, paper cups, compostable packaging, paper towels from bathrooms, and even the droppings from Ralphie the Buffalo to be converted to beneficial use instead of generating methane. The finished compost is returned to CU as a valuable soil amendment.

CONSTRUCTION AND DEMOLITION WASTE RECYCLING

OHIO UNIVERSITY (OU)

Ohio University has a very concise process for how they handle construction and renovation wastes on campus. The process has been outlined in the bullets below:

- The University determines a construction/renovation project will take place.
- Preconstruction bids and contracts with appropriate language on recycling and reuse are put in place.
- The building is cleared of all employees/students & items they wish to keep or move to the new space.
- The Recycling and Refuse Department walks the building and takes all items "not nailed down".
- Items that are "nailed down", those that are not a safety hazard or will not release hazardous materials, are removed (e.g., fixed seating, blackboards).
- Grounds recycles and reuses landscaping material around the building as will other maintenance departments.
- Recycling and reuse items are sorted and stored on campus, if needed, until appropriate outlets are found.
- Items that can be reused on campus are delivered to those who can use them (e.g., pallets for the ceramics department). The remainder goes to the compost site.
- Other reuse items will be referred to the Purchasing Department on campus.
- Other reuse items will be diverted to reuse organizations.
- Some materials will be sent to a scrap dealer for recycling.
- Items that cannot be recycled or reused will be landfilled.
- During the demolition phase, roll-offs (or dumpsters) are situated by the construction site and concrete, masonry, scrap metal, and other C&D debris is collected.
- Other C&D material that fit the OEPA definition during the project will be collected, segregated, and directed to recycling, reuse or to an approved landfill

FOOD WASTE

FOOD WASTE COMPOSTING PROGRAM AT THE UNIVERSITY OF WASHINGTON

In 2010, a total of 965 tons of food waste was collected on campus and composted. This was a 20% increase over 2009 (803 tons). Following the procurement of several sizes of compostable hot cup lids and compostable lids for soft drink cups in January 2010, the Housing and Food Services line of to-go items was about 98% compostable.

To meet the city of Seattle's new requirement that all food service products designed for one-time use be replaced with one-time use products that are either compostable or recyclable, Recycling & Solid Waste worked closely with Intercollegiate Athletics and the stadium food services vendor to ensure compliance for the 2010 football season. Recycling & Solid Waste helped the vendor purchase the required compostable food service products.

Compost carts were added to the existing waste and recycling bin sets throughout the stadium concourse area to meet the other new city requirement that compostable and recyclable items be collected in clearly labeled

bins. Recycling & Solid Waste designed custom bin signage that showed actual items sold at concession stands and their appropriate end-of-use waste stream: compost, garbage, or recycling. During the 2010 football season, a total of 11.6 tons of food waste were collected.

Post-consumer composting was launched at the University of Washington Medical Center's Plaza Café in late September 2010. The café is currently using a select line of compostable items and will add additional compostable items in the future. Clearly labeled containers for waste, recycling, and compost are at the tray return area. Recycling & Solid Waste designed and produced customized posters for the tray return area and table-top cards for the seating area. In the first three months of the program (October - December), more than 12 tons of food waste were collected each month (the average was 1-2 tons/month).

RECYCLING FACILITY

MICHIGAN STATE UNIVERSITY SURPLUS STORE & RECYCLING CENTER

In January 2008, the MSU Board of Trustees authorized a new facility to be built west of Farm Lane in the service district. The new facility would house the newly named MSU Recycling (formally the Office of Recycling and Waste Management), MSU Surplus Store and MSU Surplus Storage Solutions. The 74,000 square foot, $13.3 million facility would have an estimated 12 year payback. The money used to construct the building would not use general fund dollars; Surplus Store, Storage, and Recycling would be financially responsible.

Now open, the new facility houses Recycling, Surplus Store, Surplus Storage Solutions, and Waste Management. The building also includes an education center; compost and metal scrap bunkers; a truck scale and space for roll-off and semi-trailer storage containers. The facility gained a gold certification for Leadership in Energy and Environmental Design (LEED); some green features of the building include: rainwater collection tanks on the roof of the building that will provide toilet water; rooftop photovoltaic solar panels that will produce 10 percent of the electricity for the building; broad use of day lighting throughout the facility through large number of windows; motion sensors to control lights within high-traffic areas; low-flow fixtures in restrooms; and recycled green-glass counter tops.

In the past, MSU Recycling acted as a broker for recyclable material by shipping the materials loose to processors. Now, large quantities of material can be sorted and baled at the Material Recovery Facility (MRF), which allows the recyclables to be sold at a higher price to processors, generating more money for MSU.

MSU Recycling is working in tandem with MSU Surplus Store towards to the move from dependence on solid waste disposal to programs in waste reduction, reuse, and recycling to help MSU use resources more efficiently; simultaneously reducing the volume, cost, and environmental impacts of the university's waste. This facility allowed the university to surpass its goal of 30% recycling rate by 2015.

LOCAL/HEALTH FOODS

FARM TO ISU PROGRAM AT IOWA STATE UNIVERSITY

In 2008, the ISU Dining director came up with the concept and a grant to start the Farm to ISU program. The program was to increase the amount of local product purchased within 5 years to 35% and to educate students about buying local. To be better stewards of the Earth as we fulfill Iowa State University's mission: Create, share,

and apply knowledge to make Iowa and the world a better place. Focus on local small growers, farmers, and ranchers who use sustainable and organic practices. Support Iowa businesses as they provide local jobs and economic development. Develop a restaurant featuring Iowa products. Develop an organic Café in the Memorial Union. Develop organic features in residential dining centers and retail operation. Educate ISU community about organics, sustainability and the importance of regional food systems – where and how their food is grown. Collaborate with other off-campus organizations to strengthen ties between the community and ISU in an effort to provide a healthy regional environment.

Creating the program required working with local farmers on a regular basis to set up what products each could produce, developed standards for payments, guidelines and the logistics of getting the produce to ISU Dining. Throughout the year, local produce is tracked and data is kept on how much is purchased.

ENVIRONMENTALLY PREFERABLE PURCHASING POLICIES

ECOMUG AT WESTERN MICHIGAN UNIVERSITY

In 2009, after several unsuccessful attempts at university-wide implementation, the Western Student Association passed a resolution requesting that the administration provide mugs to all incoming students. With a new President and Vice President for Business and Finance, much more favorably disposed toward sustainability, and a fresh proposal for implementation from the Campus as a Living, Learning Laboratory class, the administration granted the student government's request. After almost a decade of foundation and relationship building, the EcoMug Program was fully funded and implemented during the 2009-2010 school year.

Sustainability researchers settled on the current mug model, the WMU President's University-wide Sustainability Committee (PUSC) enthusiastically endorsed using WMU's sustainability logo, and 6,000 EcoMugs were ordered. Through collaboration among orientation staff, the WMU Bookstore, the Division of Student Affairs, Fall Welcome, the Center for Academic Support Programs, Logistical Services, Extended University Programs, the PUSC, the Office of Business & Finance, and many others, over 4,000 mugs were handed out to incoming freshmen, transfer students, and international students. Simultaneously, the PUSC worked with Dining Services and a variety of local businesses to expand discounts and incentives to use the mugs.

For 2010-2011 the University created a variety of new refinements. They are introducing new incentives—some random and others tied to our campus and community sustainability activities and monthly campus sustainability events. They are implementing a pilot program to allow students who are on meal plans to use EcoMugs in Dining Services cafeterias. This will allow us the University to assess the EcoMug's impact on beverage costs to Dining Services and any adverse competition with University-run cash operations. They have also streamlined their distribution system by tying the mug to incoming students' ID cards and student accounts. Another change for this year is that they will be offering a lifetime warranty on mugs so that a lost or broken lid or an unfortunate encounter with a dishwasher does not lead to a trip to the landfill.

DESCRIPTION OF WASTE REDUCTION PROGRAMS AT SEC SCHOOLS

Below is a description of the waste reduction programs at the schools located within the SEC.

CLEMSON UNIVERSITY

The university follows U.S Green Building Council's Leadership in Energy and Environmental Design (LEED) rating systems in new construction and major renovation projects. Clemson has a campus-wide sustainable energy policy with the ultimate goal to reduce energy consumption by 20% by 2020, and a goal to increase its energy sourcing from renewable resources to reduce GHS emissions by 10% by fiscal year 2025.

Clemson University provides both recycling and composting services with the aim to divert waste from the landfill. The university provides centralized recycling convenience centers and public awareness programs to educate the public and increase participation. The student community is involved in a variety of action groups and the Students for the Environmental Awareness/Action (SEA) work on sustainability and environmental projects on campus. The President's Commission on Sustainability and the RecycleMania Tournament are the biggest recycling programs on campus.

The Presidents' Commission on Sustainability is replacing traditional trash bins with paper-only recycling bins and *mini* trash bins. Mini trash bins at desks will up be emptied by the individual into a larger trash receptacle in the hallway. The Alcoa grant, College University Recycling Coalition, and Keep America Beautiful provided 7,000 recycling bins for offices, classrooms, and other areas. The pilot project in Brackett and Sirrine halls showed a double increase rate in recycling. Additionally, Clemson participates on the RecycleMania Tournament competition among over 600 schools for the most recyclables collected. The school is doing better than USC on a per capita basis this year. Tournament results are available at the bottom.

UNIVERSITY OF ALABAMA

Last year, The University of Alabama was selected as one of the 5 finalists for the 2010 Southern Association of College and University Business Officers Best Practices Competition. Recycling rates are increasing. The school recycled 885.8 tons in 2009, 86% higher than the year before. Composting rates are also increasing, and Bama Dining composts 4,000 lbs per week.

The campus primary sustainability goal is to reduce energy consumption by 2% per square foot per year by 2010. It also hopes to promote sustainable buildings while encouraging LEED standards, decrease exterior light pollution, and replace ozone-depleting refrigerants. Recycling collection points are required in all new buildings, and bicycle paths are being constructed contributing to the school's goal to move towards a pedestrian friendly lifestyle. The university also encourages sustainability by offering students a sustainable package for $25. This package includes reusable to-go box, reusable mug, organic sustainable t-shirt, reusable grocery bag, 5 lbs of food donated from Bama dining to West Alabama Food Bank, and tree planted in student name throughout American forests.

UNIVERSITY OF ARKANSAS

The University of Arkansas main goals are to become a carbon neutral institution and a zero waste institution as soon as it is practical. Its Climate Action Plan lays out details to becoming zero-waste and carbon neutral.
The university's Razorback Recycling Services collects, processes, and stores and markets all recyclables. Its Materials Recovery Facility (MRF) includes horizontal baler, conveyor and box tipper, fork lift, scales, and etc. Razorback Recycling Services accepts white paper, mixed paper, cans and bottles, cardboard, mattresses, bulbs, ballast, pallets, refrigerators, air conditioner, grease, telephone books, paints, batteries, tires, toner, text books,

and limbs (branches, etc). The University of Arkansas participates on RecycleMania and recycled 279,737 lbs during a 10 week period with an average of 1.37 lb/capita.

AUBURN UNIVERSITY

Auburn University is currently developing a Climate Action Plan to reduce the campus's carbon footprint and move towards more sustainable practices. The university operates a tri-stream recyclable program sorting recyclables into three categories, mixed paper, plastic and aluminum, and cardboard, and students are responsible for taking their recycling to a central location near residence halls.
The Game Day Recycling Program happens during home football games. Blue containers for plastics and cans are placed at tailgate areas around university buildings and at the stadium, while recycling dumpsters for plastics and aluminum are available at RV lots. Student volunteers pass out litter and recycling bags to tailgaters around campus, and "Get Caught Winners" receive an autographed prize signed by Coach Gene Chizik. Auburn University also includes other recycling programs.

The residential recycling program provides each room with 2 bags, one for mixed paper and cardboard and the other for cans and plastics. Toner Cartridge Recycling provides bins in selected buildings around campus, and the Electronics/Appliance Recycling and Document Shredding Event, is an open to the public event that sells TV sets for $ 10 and all other electronics for free. The university participates on the RecycleMania with a record of 29,540 lbs.

UNIVERSITY OF FLORIDA

The University of Florida wants to set a good example of sustainable living for its students and established a goal to become a zero-waste institution by 2015. With this in mind the university made a list of the most sustainable practices of campus versus the least sustainable practices.

- Most sustainable on campus
  - irrigation—90% reclaimed water
  - alternative transportation options—biking, GreenRide and FlexCar, and RTS
  - gator dining—locally sourced produce
  - LEED commitment
  - Student enthusiasm
  - incentives for activating faculty and staff interest
- Least sustainable on campus
  - energy consumption and waste
  - transportation—RTS pollution (air and noise), biking safety, single occupancy vehicle travel
  - decentralized campus
  - lack of sustainable integration into campus operations and culture
  - inefficient use of space in built environment
  - academics—not enough sustainability-related content

The university recycles paper, cardboard, aluminum, 1 and 2 plastics, glasses, yard trimmings, chemicals, toner cartridge, and other metals such as steel cans and appliances. During FY05 UF diverted 36.93% of solid waste. The university recycled 773,009 lbs on an average of 1.06 lbs/capita during the RecycleMania Tournament.
University of Georgia—Athens, GA

In 2007 the University of Georgia recycled a total of 1,147.66 tons of waste. Out of the 1,147.66 total, 66.01 tons commingled bottles and cans, 56.71 tons mixed paper, 230.11 tons cardboard, and 794.83 tons of office paper (approx. 28% recycling rate). The university recyclable materials are bottles and cans, antifreeze, motor oil, tires, scrap metal, cooking oil, pallets, cell phones, and ink cartridge.

The Green Cleaning Initiative and Grounds Department are part of an alternative to increase sustainability and work safety on campus. The first one increases productivity by decreasing worker's fatigue, contact with waste, and absenteeism. The Grounds Department minimizes pesticide and fertilizer use by planting native plants. The university participates in the RecycleMania with a record of 638,779 lbs.

UNIVERSITY OF KENTUCKY

The University of Kentucky recycled 31.67% of its waste and diverted a total of 9,789,912 lbs in 2007.This school recycles computer paper, white bond, color bond, carbonless multi-sheet forms, groundwood paper, envelopes, pamphlets, newsletters, post-it notes and memo pads, folders, tab/ibm punch cards, magazines, newspapers, and blueprints.

Kentucky's Dining room services is committed to forming partnerships with local producers (produce, dairy and meat), establishing waste minimization measures, and it is actively seeking energy conservation measures. The Residence Hall Energy Challenge offers energy audits. The university participates in the RecycleMania Tournament recycling 645,073 lbs with an average of 2.22 lbs/capita.

LOUISIANA STATE UNIVERSITY

The Louisiana State University has a solid waste stream of 12,000 tons per year. The university recycles about 1,350 tons, 20% of the waste produced. The recycling goal is to have 1 blue bin in each office or classroom and to match each street garbage can with a recycling container. LSU requires contractors to create a waste management plan to divert 50% of its construction and demolition waste from landfills or incinerators.
The Football Recycling is an in-stadium recycling effort that increased recycling by 77% during regular football season. Volunteers from ECO (student-run Environmental Conservation Organization) and Volunteer LSU stood near 25 recycling bins placed throughout the stadium asking attendees to recycle their refuse instead of throwing it away.

The university recycles E-waste and organizes recycling events. In 3 days, FAS collected 27 CPUs, 32 monitors, 1 laptop, 26 misc pieces and 24 printers. The Fall-Fest turns eco-friendly ('welcome back to campus for students' event) featured composting and recycling efforts. In 2010—Almost 75% of waste from Fall Fest was either recycled (53%) or composted (20%). The student group 'Student Environmental Action Coalition (SEAC) attempts to increase recycling on campus and started a pilot program in 7 dorms to recycle: glass, plastic, aluminum and paper.

LSU is committed to sustainable practices. Its Bike Facilities Master Plan placed bike racks and lockers around campus and used LEED standards. The school planed 289 new trees during fall 2008 and has the mission to research and evaluate new and innovative measures through which the University can continuously improve its impact on the environment. LSU recycled 579,130 lbs during the RecycleMania Tournament.

MISSISSIPPI STATE UNIVERSITY

Mississippi State University finished its fall 2009 Recycling "Trial" program collecting 75,000 lbs of material. The university recycles aluminum, cardboard, glass, metal, all types of paper, and plastics (1-7).The following recycling companies, Triangle Maintenance, Starkville Recycling and Mississippi Industrial Waste Disposal were

hired to educate and implement recycling programs on campus. In April 2010, the university signed an agreement with Triangle Maintenance for BluBox Recycling (single stream).
The recycling program Football Games are Greener supports the Keep it Clean initiative for a sustainable season. This initiative doesn't charge for tailgating, but counts on them to bag their trash and recycle whenever possible. The university also relies on volunteers to empty recycling and trash bins, load garbage bags and help clean up during the Cotton District Arts Festival.

The university has a vision to obtain and operate sustainable campus by the year 2020. It hopes to reduce resource use and waste/pollution reduction by 50%, and increase sustainable transit measures, recycling activity, sustainable curriculum and research activities, and community/university sustainable partnerships by 50%. Mississippi State recycled 3,418.45 lbs during the RecycleMania Tournament.

UNIVERSITY OF TENNESSEE

The University of Tennessee signed American College and University Presidents' Climate Commitment (ACUPCC) with the goal to make UT climate neutral. All future construction of buildings will be designed with LEED standards in mind, and the school will add sustainability fees to its tuition. Currently, the university recycles paper, plastics (1-7), aluminum, cardboard, and special materials such as phonebooks cartridges, and e-waste. 110 recycle bins for containers and 30 for papers were placed in tailgate areas during football games. The university recycled 337,624 lbs during the RecycleMania Tournament.

The 2008 Move-In Recycle Program brought 13,000 lbs of cardboard. Cardboard recycling boxes are available outside the residence hall and Paperboard recycling is available on each floor. Each dorm room has 6-gallon recycling basket and 2x 50-gallon recycling bins on each floor. Move-Out Program for donation collects containers for items in residence hall lobby. Non-perishable unopened food items, clothes and reusable household items are acceptable for donation. Clothing and household items go to Goodwill Industries—Knoxville (electronics will be recycled if they can't be reused/sold).Non-perishable food items (unopened) go to Second Harvest Food Bank.

VANDERBILT UNIVERSITY

In 2009, Vanderbilt University recycled more than 2.5 million pounds of material. Vanderbilt recycles mixed paper, aluminum and tin, plastic (1-2), glass, cardboard, and special items such as e-waste, light bulbs, and batteries. The Vandy FreeSwap allows faculty and students to trade stuff for free instead of landfilling it. Styrofoam filled 2x26-foot trucks during the 2009 Move-In Program. The program added film recycling in 2010, and started to utilize water stations instead of handling out water bottles. The university recycled 277,380 during RecycleMania Tournament.

Students groups are very active at this school. Students Promoting Environmental Awareness and Responsibility (SPEAR) started composting pre-consumer food waste from dining facilities, and the alternative Energy Club (AEC) educates students about diverse alternative energy resources (biodiesel, wind, solar).

SEC UNIVERSITY WASTE REDUCTION BENCHMARKING

The table below depicts how each of the SEC universities rank against each other on common waste reduction benchmarks.

	Units	U of Florida[1a]		U of Georgia[1]		U of Kentucky[2]		U of SC	
Recycling/Sustainability Coordinator[S]	R, S or Both	S		R		S		Both	
Sustainability Degree Available[S]	UG, G or None	UG, G		None		UG		UG, G	
RecycleMania[R]	Benchmark, Competition or No	Competition		Competition		Competition		Competition	
University Students[R 2011]	# of Full-time equivalent people	49655		31893		21534		24501	
University Faculty/Staff[R 2011]	# of Full-time equivalent people	13424		10055		11475		6921	
Total Population[R 2011]	# of Full-time equivalent people	63079		41948		33009		31422	
RM Grand[R 2011]	Overall Recycling Rate (%) | Rank			29.17%	132			22.49%	200
RM Per Capita[R 2011]	recycling lbs/person | Rank	9.92	184	12.18	135	10.94	166	7.31	250
RM Waste Minimization[R 2011]	Waste lbs/person |Rank			41.75	92				
RM Gorilla[R 2011]	Recyclables Tons | Rank	312.765	13	255.42	22	180.5605	42	114.787	84
STARS[S]	Yes or No	Y		N		N		N	
Total Recycled[S]	tons (2010)	9784.9				4894.956			
Total Composted[S]	tons (2010)	1671.4		37.5		142.5			
Total Landfilled[S]	tons (2010)	11175.9				10560.705			
Overall Recycling Rate[S]	% of waste	43.234%		43%[G]		31.382%		17%[G]	
Normalized Recycling Rate[S]	lbs/person	310.243				296.583			
Overall Composting Rate[S]	% of waste	7.385%				0.914%			
Normalized Composting Rate[S]	lbs/person	52.994		1.788		8.634			
Construction & Demolition	% of C & D waste	83%[G]		78%[1]		>5%[G]		75%	
Recycling Handling	In-house or Outside	In-house		In-house		In-house			
Recycling Types	C, MP, P#, G, Al, T, S, M, B, St	MP, P1-7, G, Al		Al S T G P1-2 C MP, M, Pal		C, MP, P1-2, M		C, MP, Al, P1-2, G, B	
Biodiesel from On-campus Grease		Y		Y		Y		N	
Move-in/out Program	Yes or No	N		Y		N		Y	
Collection		Dual		Dual				Dual + OCC	
Event/Athletics/Tailgate Recycling	Yes or No	Y		Y		Y		Y	
Env. Preferable Purchasing[S]	STARS (out of 7.5)	3.41		N		Y			
Presidents Climate Commitment[P]	Yes or No	Y		N		N		Y	
STARS Participation[S]	Points	Silver (62.89)		N		N		N	
LEED Buildings (out of 4)[S]	# of Plat., Gold, Silver, Cert.	2.39		1 G, 4 S		None		1G, 2S	
E-Waste[S]	Yes or No	Y		N		Y		Y	
Food Waste Composting[S]	Pre or Post Consumer	Pre		Pre					

	Units	Clemson U		U of Tenn[3]		Vanderbilt U		U of Alabama	
Recycling/Sustainability Coordinator[S]	R, S or Both	R		E		S, R		R	
Sustainability Degree Available[S]	UG, G or None	None		None		UG, G		UG	
RecycleMania[R]	Benchmark, Competition or No	Competition		Competition		Competition		No	
University Students[R] 2011	# of Full-time equivalent people	17804		24786		11209		27,014 (raw)C	
University Faculty/Staff[R] 2011	# of Full-time equivalent people	4735		8119		7156			
Total Population[R] 2011	# of Full-time equivalent people	22539		32905		18365			
RM Grand[R 2011]	Overall Recycling Rate (%) | Rank	31.95%	108	13.02%	266	24.51%	177		
RM Per Capita[R 2011]	recycling lbs/person | Rank	11.34	156	10.94	167	5.57	282		
RM Waste Minimization[R 2011]	Waste lbs/person |Rank			84	165	22.75	33		
RM Gorilla[R 2011]	Recyclables Tons | Rank	127.8435	69	179.955	43	51.1865	159		
STARS[S]	Yes or No	N		N		N		N	
Total Recycled[S]	tons (2010)							482.3	
Total Composted[S]	tons (2010)			21					
Total Landfilled[S]	tons (2010)								
Overall Recycling Rate[S]	% of waste	22.50%		7.4%[G]		14.5%[G]		25.76%[G]	
Normalized Recycling Rate[S]	lbs/person								
Overall Composting Rate[S]	% of waste								
Normalized Composting Rate[S]	lbs/person								
Construction & Demolition	% of C & D waste	77%[G]		--		54%[G]		15%[G]	
Recycling Handling	In-house or Outside	In-house						In-house	
Recycling Types	C, MP, P#, G, Al, T, S, M, B, St	Al, OCC, G, MP, P1-2, S, toner, B		C, MP, P1-7, Al, B		C, MP, Al T, P1-2, B		Al, MP, C, P1-7, M	
Biodiesel from On-campus Grease		Y		N		Y		N	
Move-in/out Program	Yes or No	Y		Y		N		N	
Collection		Dual		Dual + OCC		Dual + OCC			
Event/Athletics/Tailgate Recycling	Yes or No			Y					
Env. Preferable Purchasing[S]	STARS (out of 7.5)								
Presidents Climate Commitment[P]	Yes or No	Y		Y		N		N	
STARS Participation[S]	Points	N		N		N		N	
LEED Buildings (out of 4)[S]	# of Plat., Gold, Silver, Cert.	1 G, 2 S, 1 C		6 =, not cert		4G, 5S, 2C		2 =, not cert	
E-Waste[S]	Yes or No	Y		Y		Y		Y	
Food Waste Composting[S]	Pre or Post Consumer			Pre		Pre (Pilot)		Pre	

	Units	U of Arkansas		Auburn U[10]		LA State U		MS State U		U of Mississippi	
Recycling/Sustainability Coordinator[S]	R, S or Both	S		S		Committee		S		S	
Sustainability Degree Available[S]	UG, G or None	UG, G		UG minor		UG, G		UG		None	
RecycleMania[R]	Benchmark, Competition or No	Competition		Competition		Competition		No		No	
University Students[R 2011]	# of Full-time equivalent people	16719		22067		26500		17,824 (raw)[C]		15,220 (raw)[C]	
University Faculty/Staff[R 2011]	# of Full-time equivalent people	4633		6482		7102					
Total Population[R 2011]	# of Full-time equivalent people	21352		28549		33602					
RM Grand[R 2011]	Overall Recycling Rate (%) | Rank	31.30%	115	7.84%	283	27.31%	150				
RM Per Capita[R 2011]	recycling lbs/person | Rank	8.93	213	4.68	300	12.44	133				
RM Waste Minimization[R 2011]	Waste lbs/person |Rank	28.52	44								
RM Gorilla[R 2011]	Recyclables Tons | Rank	95.3105	101	66.773	131	208.97	32				
STARS[S]	Yes or No	Y		N		N		N		N	
Total Recycled[S]	tons (2010)	1356				1471 '12					
Total Composted[S]	tons (2010)	18									
Total Landfilled[S]	tons (2010)	2390				4144 '12					
Overall Recycling Rate[S]	% of waste	36.026%		22%[G]		22%[G]		20%[G]		9%[G]	
Normalized Recycling Rate[S]	lbs/person	127.014									
Overall Composting Rate[S]	% of waste	0.478%									
Normalized Composting Rate[S]	lbs/person	1.686									
Construction & Demolition	% of C & D waste	60%[G]		26%[G]		30%[G]		30%[G]		Unknown[G]	
Recycling Handling	In-house or Outside	In-house				In-house		In-house		In-house	
Recycling Types	C, MP, P#, G, Al, T, S, M, B, St	P, MP, P1-2, Al, C		C, MP, PL1-2, Al, S, T		MP, C, PL1-7, G, A, T		C, MP, PL1-7, St, M, G		C, MP, P1-2, Al, T	
Biodiesel from On-campus Grease		N		N		N		N		Y	
Move-in/out Program	Yes or No	N		N		N		N		N	
Collection		3 Stream		Dual + OCC		Single		Single		Dual	
Event/Athletics/Tailgate Recycling	Yes or No			Y		Y		Y			
Env. Preferable Purchasing[S]	STARS (out of 7.5)	3.39						Y			
Presidents Climate Commitment[P]	Yes or No	Y		Y		N		Y		Y	
STARS Participation[S]	Points	Silver (52.84)		N		N		N		N	
LEED Buildings (out of 4)[S]	# of Plat., Gold, Silver, Cert.	1.5		2G		2 =, not cert		None		1 =, not cert	
E-Waste[S]	Yes or No	Y		Y		Y		Y		Y	
Food Waste Composting[S]	Pre or Post Consumer										

SEC University Waste Reduction Benchmarking Table Key

Table SuperScript Code – Information Source
R - RecycleMania (http://www.recyclemaniacs.org/universities.asp)
P - PCC (http://www.presidentsclimatecommitment.org/signatories/list)
G - http://www.greenreportcard.org/report-card-2011/schools
C - http://colleges.collegetoolkit.com/colleges/overview/
1 - http://www.sustainability.uga.edu/index.php?/site/whatweredoing/waste/
1a - http://sustainable.ufl.edu/office-of-sustainability/programs/
2 - http://www.sustainability.uky.edu/node/183
3 - http://www.pp.utk.edu/Recycle/
10 - http://www.auburn.edu/administration/facilities/organization/building-services/recycling/programs/index.html
12 - http://sustainability.lsu.edu/Materials/Recycling/item13406.html

Recycling/Sustainability Coordinator - "R" refers to programs with recycling coordinator, "S" to sustainability coordinator, and "E" to environmental coordinator. (Source - *AASHE (https://stars.aashe.org/institutions/))*

Sustainability Degree Available - This section refers to institutions with sustainability degrees. "UG" stands for undergraduate degrees in sustainability while "G" stands for graduate degrees. Institutions with no sustainability degrees say "None." (Source - *AASHE (https://stars.aashe.org/institutions/))*

RecycleMania - This is a competition and a benchmarking tool for schools' recycling programs. Schools report their recycling and trash data over a 10 week period and the school with the highest recycling rate wins. This competition encourages schools to reduce and recycle. Schools that say "Competition" are registered with RecycleMania while schools that say "No" are not. (Source - *RecycleMania (http://www.recyclemaniacs.org/universities.asp))*

University Students - This section refers to the amount of full-time students in each school in 2011. (Source - *RecycleMania (http://www.recyclemaniacs.org/universities.asp))*

University Faculty - This section refers to the amount of full-time staff in each school in 2011. (Source - *RecycleMania (http://www.recyclemaniacs.org/universities.asp))*

Total Population - This section refers to the amount of full-time people in each school in 2011. (Source - *RecycleMania (http://www.recyclemaniacs.org/universities.asp))*

RM Grand - RM Grand refers to RecycleMania 2011 Grand Champions. The first column provides the school's overall recycling rate and the second column shows the school's rank in the competition. (Source - *RecycleMania (http://www.recyclemaniacs.org/universities.asp))*

RM Per Capita - The RecycleMania Per Capita is a competition to see which school collects the largest amount of recyclables per person in 2011. The first column provides the recycling pound per person, and the second column shows the school's rank in the competition. (Source - *RecycleMania (http://www.recyclemaniacs.org/universities.asp))*

RM Waste Minimization - The RecycleMania Waste Minimization is a competition to see which school produces the least amount of municipal solid waste (recyclables and trash) per person in 2011. The first column provides

the waste pound per person, and the second column shows the school's rank in the competition. (Source - *RecycleMania (http://www.recyclemaniacs.org/universities.asp))*

RM Gorilla - The RecycleMania 2011 Gorilla Prize is a competition to see which school can collect the highest gross tonnage of recyclables (regardless of the campus population). The first column provides the recyclable tons, and the second column shows the school's rank in the competition. (Source - *RecycleMania (http://www.recyclemaniacs.org/universities.asp))*

STARS - The Association for the Advancement of Sustainability in Higher Education (AASHE) is an association of universities and colleges committed to a sustainable future. AASHE provides resources, professional development, and networking opportunities to help these institutions become more sustainable. AASHE developed The Sustainability Tracking Assessment & Rating System (STARS) to measure each institution sustainability performance. "Y" refers to institutions registered with STARS and "N" to institutions that are not registered with STARS. (Source - *AASHE (https://stars.aashe.org/institutions/))*

Total Recycled - This section provides the total amount of tons recycled by each school in 2010. (Source - *AASHE (https://stars.aashe.org/institutions/))*

Total Composted - This section provides the total amount of tons composted by each school in 2010. (Source - *AASHE (https://stars.aashe.org/institutions/))*

Total Landfilled - This section provides the total amount of tons landfilled by each school in 2010. (Source - *AASHE (https://stars.aashe.org/institutions/))*

Overall Recycling Rate - This section provides the percentage of waste recycled in each school. (Source - *AASHE (https://stars.aashe.org/institutions/))*

Normalized Recycling Rate - This section provides the pounds per person rate. (Source - *AASHE (https://stars.aashe.org/institutions/))*

Overall Composting Rate - This section provides the percentage of waste composted in each school. (Source - *AASHE (https://stars.aashe.org/institutions/))*

Normalized Composting Rate - This section provides the pounds per person rate. (Source - *AASHE (https://stars.aashe.org/institutions/))*

Construction & Demolition - This section provides the percentage of construction and demolition waste in each school.

Recycling Handling - Recycling done "in-house" means that recycling was done on the school's facility, while "outside" means that it was contracted out.

Recycling Types - For abbreviations please check the following: Old Corrugated Cardboard "OCC," Mixed Paper "MP," Plastics "P1-7," Glass "G," Aluminum Can "AL," Tin "T," Steel "S," Mixed Metals " MMO," Batteries "AA + AAA" or "B," Styrofoam " EPS," Pallets "Pal," and Toner Cartridge "TC."

Biodiesel from On-campus Grease - "Y" refers to institutions that use grease to produce biodiesel (they convert used cooking oil into fuel) on-campus and "N" to institutions that don't.

Move-in/out Program - This section refers to institutions that hold move-in and move out recycling programs. "Y" refers to institutions that have move-in/out programs and "N" to institutions that don't.

Collection - This section refers to the type of system that the institutions use to collect their recyclables from the general waste stream. "Single" stands for single stream recycling where all recyclables are mixed together and there is no need for sorting by individuals. "Dual" stands for a type of collection where cans and bottles are collected separately from paper products. The "3 Stream" system stands for a type of collection that separates materials through three different recycling bins. "OCC" stands for old corrugated cardboard; therefore, institutions that have "+ OCC" also include OCC to their collection system.

Event/Athletics/Tailgate Recycling - Many institutions have special events recycling to eliminate waste and promote recycling. "Y" refers to institutions that have any type of special events recycling and "N" to institutions that don't.

Env. Preferable Purchasing - The Environmental Preferable Purchasing (EPP) encourages colleges and universities to buy green products. The table provides the STARS rating for each school's EPP program. (Source - *AASHE (https://stars.aashe.org/institutions/))*

Presidents Climate Commitment - The American College & University Presidents' Climate Commitment (ACUPCC) provides support and framework for colleges and universities to implement comprehensive plans that support climate neutrality. "Y" refers to institutions that have made this commitment and "N" to institutions that haven't. (Source - *PCC (http://www.presidentsclimatecommitment.org/signatories/list))*

STARS Participation - The STARS program rates colleges and universities accordingly to their sustainability progress. Following are the five levels of STAR rating and points from lowest to highest: Bronze, Silver, Gold, Platinum, and Reporter. (Source - *AASHE (https://stars.aashe.org/institutions/))*

LEED Buildings (out of 4) - LEED ranks energy efficient buildings. Following are the four levels of LEED rating and points from lowest to highest: Certified "C", Silver "S", Gold "G", and Platinum "P." Some institutions have buildings with different rankings; therefore, the numbers in front of the letters stand for the amount of buildings and the letter stands for the ranking. Institutions with no certification say "None." (Source - *AASHE (https://stars.aashe.org/institutions/))*

E-Waste - "Y" stands for institutions that recycle electronic waste and "N" stands for institutions that don't. (Source - *AASHE (https://stars.aashe.org/institutions/))*

Food Waste Composting - This section refers to the type of composting that each institution uses. "Pre" refers to institutions that only accept pre-consumer food composting and "Post" for post-consumer food (includes food scraps) composting. (Source - *AASHE (https://stars.aashe.org/institutions/))*

USC WASTE SORT PROCEDURES

The following protocol will be used for sorting waste samples during the March 17 and March 18 campus waste sort. RRS has identified specific procedures and tasks that will require assistance from the University and student volunteers. RRS has outlined a list of waste sort and safety materials, residence halls where samples will be pulled, flow diagram of how materials will get to the sort location and protocols on how the samples will be sorted. All items are subject to approval by the University's Department of Landscaping and Environmental Services staff and USC Project Manager.

Waste Sort and Personal Safety Equipment

The following chart outlines what waste sort and personal safety equipment is required for the waste sort. The University has identified materials that they will be providing for the waste sort. All materials will need to be available at the waste sort location on Wednesday, March 16 at 12:00pm.

At this time, we are estimating the following staff/volunteer information for the personal safety equipment:

- RRS staff (2) – 2 days of sorting
- USC staff (3) – 2 days of sorting
- USC student volunteers (16) – 4 shifts (3 hours each) with 4 students in each shift
- Extra (2) – extra safety equipment

It is expected that all staff and student volunteers will provide their own hard bottomed, non-slip boots or shoes.

Equipment Items	Quantity	University Provide	RRS Provide
Personal Safety/Protective Equipment			
Tyvek disposal coveralls/aprons (or equivalent) - large	28	X	
Kevlar knit gloves (cut/puncture resistant)	12	X	
Vented goggles/safety glasses with full side shields	12	X	
Dust masks (NIOSH N95 rated)	28	X	
Nitrile disposable gloves – medium	1 box	X	
Nitrile disposable gloves - large	1 box		
First aid kit	1	X	
Eye wash kit	1	X	
Moist disposable towelettes	1 box	X	
Hand sanitizer	1 bottle	X	
ABC fire extinguisher (5lb minimum)	1	X	
Cell phone	At least 1		X
Bottles of water	2 gallons		X
Waste Sort Equipment			
Pick-up truck (material transportation)	1	X	
Knife with fixed blade	1	X	
Platform scale (100 kg x .05 kg; 20” x 20” platform)	1		X
Plastic sheeting/tarps	5	X	
1 gallon buckets (or similar containers)	5	X	
5 gallon buckets (or similar containers)	40	X	
Sorting tables (6’ to 8’ length)	4	X	
Flat scoop shovel	1	X	
Coarse bristle push broom	1	X	
Trash bags (13 gallon)	1 box	X	
Dust pan and handheld whisk broom	1		
Trash bags (55 gallon)	1 box	X	
Trash dumpster (6-8 cubic yards)	1	X	
Cardboard roll-cart (64 gallons)	1	X	
Office paper roll-cart (64 gallons)	1	X	
Bottles/cans roll-cart (64 gallons)	1	X	
Newspaper roll-cart (64 gallons)	1	X	
Glass roll-cart – clear (64 gallons)	1	X	
Glass roll-cart – brown (64 gallons)	1	X	
Duct tape	2 rolls	X	
Digital camera	1		X
Permanent markers	3	X	
Label/stickers	1 package	X	
Clipboards	3		X
Paper data sheets			X
Calculator	1		X

Residence Hall Waste Material Sources

RRS will be collecting waste samples from the following residence halls on the following days.

Thursday, March 17, 2011

- Preston
- Maxcy
- East Quad
- McClintock
- Wade Hampton
- Capstone House

Friday, March 18, 2011

- The Roost
- Cliff
- McBryde
- Honors College
- West Quad

Safety Training and Protocols

RRS will provide safety and protocol training for all staff and volunteers conducting the waste sorts consistent with University and regulatory policy and standards. At a minimum, the following will be addressed:

- Handling of sharps, hazardous wastes or other suspicious materials
- Fire safety
- Required clothing/footwear, personal protection equipment (PPE) and how to wear PPE
- Waste sort procedures – material collection, sorting and weighing protocols
- Recording procedures and photo documentation
- Setup & teardown instructions
- Housekeeping and other on-site issues
- Procedures for adverse weather

Waste Sort Characterization Protocols

RRS will use the following waste sort protocols and sampling procedures to conduct the waste sort.

RRS will plan to set up the 4 tables for material sorting and data computation needs. Tarping/plastic sheeting will be used to contain and cover any unsorted samples and spoils from completed sorts if these cannot be contained in containers designated for that purpose. The set of plastic buckets/containers will be set out around the sorting table identifying the following list of materials that RRS will be quantifying. Each container will be labeled with a tare weight and tare weights will be checked every day and at any time when materials are emptied from the containers. The entire sample will also be weighed and the sum of the sort categories compared to allow uncertainty calculations for weighing errors and material loss. RRS will be quantifying the following list of materials as part of this waste characterization.

Paper

- High grade office paper
- Low grade paper
- Newsprint/magazines
- Corrugated cardboard
- Boxboard
- Aseptic packaging and beverage cartons
- Poly-coat papers (including coated freezer boxes and molded cups)

Plastics (2 sort categories - bottles and tubs/containers)

- PETE #1
- HDPE #2
- PVC #3
- LDPE #4
- Polypropylene #5
- Polysytrene #6
- Other plastics #7 and unidentified plastics

Metal

- Aluminum
- Other non-ferrous metals
- Tin/steel
- Other ferrous metals

Glass

- Clear
- Green
- Amber
- Other glass

Organics

- Food scraps/waste
- Other organics

Other Materials

- Textiles
- Office supplies
- Electronic waste

RRS has determined that residence hall waste must be intercepted before it is placed in commonly shared compactors or dumpsters. In residence halls without trash chutes, this means selecting and collecting waste before the custodial staff makes their rounds to empty trash containers. RRS staff will plan to enter the residence halls at 9:00am (or earlier as determined by Housing facilities) on the sort day, label and pull waste sample bags from the various locations to provide a representative sample. The "labeled" sample bags will be placed into a gray tip cart and transported outside where they will be placed at a central collection location. A Facilities staff member will come to each central collection location to pick up the "labeled" sample bags and transport the bags to the waste sort area.

In the Honors College, East Quad and West Quad residence halls where a trash chute is used by residents, RRS has determined that some means is needed to intercept waste materials either at the chute loading stations or at the compactor feed point. RRS will work with Housing facilities staff to temporarily place carts in front of the waste feed chutes and instruct residents to use carts for one day and mark the chutes as out-of-service. Both of these locations will need to have a collection cart placed in front of the chute on Thursday, March 17, 2011 to collect waste bags. The following day, RRS would select and label bags to be sorted from each cart and send the remaining waste bags down the chute. The gray tip carts would then be wheeled to the loading dock for pickup by a Facilities staff member for transport to the waste sort area.

RRS will plan to label and pull 5-10 bags of waste from each residence hall to generate a representative sample. RRS will ensure a statistically valid sample is pulled, collecting approximately 100 to 150 pounds of waste from the 5-10 bag grab sample. The bagged waste will be transported to the waste sort site via the University Facilities staff and unloaded onto a tarped waiting area. The following process flow diagram shows how materials will be pulled and transported to the waste sort site.

Once the samples arrive at the waste sort site, individual bags will be placed on a sorting table and raked to look for any hazardous or bio-hazardous waste. If these types of wastes are identified, all safety protocols will be followed and the USC Project Manager and University OSEH department will be notified immediately. Sorters will pull materials from the opened waste bags on the tables and put them in the appropriately labeled buckets/containers. Once the bucket is full, it will be weighed and recorded on a data sheet. All waste that has been sorted will be put on another tarped area for disposal and/or recycling into a labeled nearby waste and/or recycling container.

RRS will take photos of each waste sort so there is photo documentation of materials from each sort location.

Staffing

It is expected that waste samples will be pulled and transported to the waste sort location between 9:00am and 10:00am. Waste sorting is expected to occur in two shifts: (1) 10:00am to 1:00pm and (2) 1:00pm to 4:00pm. RRS will have at least two of its staff on campus during collection and sorting. An additional 4 student volunteers are expected to participate during each of the waste sort shifts. If all samples are not sorted by 4:00pm, RRS staff will plan to finish sorting the samples.

Waste Sort Location

All waste samples will be transported by Facilities staff from the residence halls to 700 Pendleton St. (building on the other side of the waste pad). This is an enclosed space and is covered in case of rain.

Pre Waste Sort Set-up

All waste sort equipment will need to be available at the waste sort location on Wednesday, March 16 at 12:00pm. RRS staff plan to have the sort site, all sort equipment and containers labeled/weighed on Wednesday afternoon before the waste sorting begins on Thursday, March 17.