ZERO WASTE

Zero Waste Athletics: Pilot Audit – John Paul Jones Arena

Global Sustainability, Spring 2013

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ABSTRACT

Under the leadership of the student-founders for the Zero Waste Athletics Campaign, Matt Boegner and Ashley Badesch, our group developed metrics for pilot audit, researched methods of waste audits, analyzed the pilot event's performance, and translated our information into a useful report that will promote the expansion of the campaign to other venues and events. We observed the first larger-scale pilot audit hosted by Zero Waste Athletics (the Globetrotters basketball game), as well as visited Black Bear Composting to learn about the post-event trash and composting process. Overall, our group believes that the pilot audit at John Paul Jones Arena was a major success, but there is room for improvement. The Zero Waste Athletics Campaign is definitely ready to be implemented in larger-scale events on Grounds, with improvements, based on analyses of similar precedents and reflection on the pilot audit.

In summary, the Zero Waste Athletics Campaign aims to make the University a leader in sustainable practices by reducing the environmental impact of UVA athletic events. Pilot audits are conducted to experiment, on a small-scale, the effectiveness of a school's campaign in reducing waste before determining a large-scale approach at waste reduction.

I. INTRODUCTION

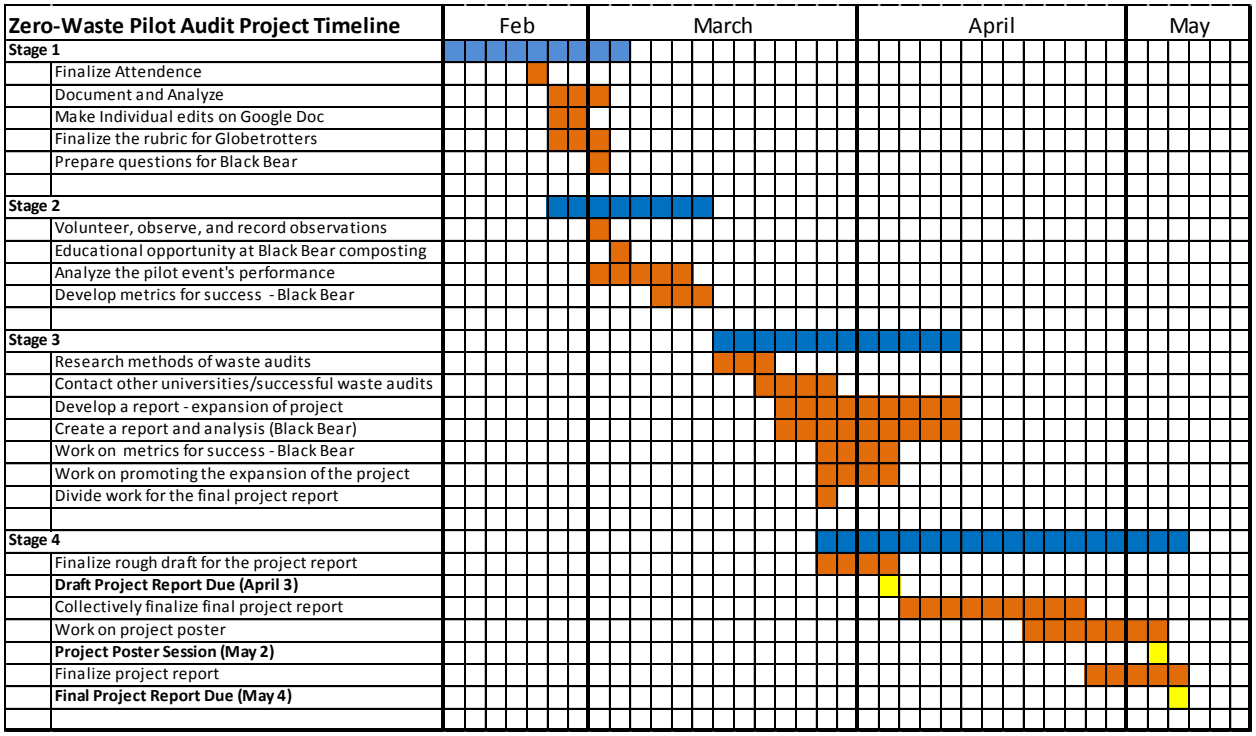
Our project addresses the issue of managing and reducing waste at the University of Virginia. This not only affects the UVA community, but also has the potential to affect the greater Charlottesville community and beyond. While the topic of waste is very general, this project will be delving into specific aspects of waste—Zero Waste Athletics.

What is zero waste? Zero waste is a nationwide initiative to divert all waste, collected at school athletic events, from being sent to a landfill. It allows for sustainability by ensuring that products are reused, whether through recycling or composting. Zero Waste Athletics goal states that, "The overarching objective of the Zero Waste Football Initiative is to divert all waste (>90%) produced at UVA athletic facilities from the landfill…in addition to reducing the environmental impact of UVA athletic events, we aim to make UVA Athletics the leaders in sustainable practices in the ACC" (Badesch). This is exciting because not only do their goals affect the health and well-being of the UVA community, but Zero Waste Athletics has the potential for those involved to become leaders and promoters of sustainability and waste management in other campuses.

What is a pilot audit? A pilot audit involves actively separating compostables and recyclables, with the help of volunteers, during and after a small-scale event. Results from a pilot audit are helpful in determining large scale zero waste practices. Small-scale events are helpful by limiting the number of volunteers needed for the event. It is also a better size for determining errors and controlling experimental variables.

There is always a need for energy, motivation, and movement towards a less wasteful community. Zero Waste Athletics must implement a plan that will continue its initiative from 2012 into 2013 and beyond. Since the completion of the pilot audit in March 2013, it is essential that Zero Waste Athletics, along with groups such as ours, continue to research similar precedents and determine how Zero Waste events can be improved for the future. Throughout this report, we included recommendations and critiques based on successful waste audits at campuses around the country. The stakeholders most clearly involved are the university students and those who use dining facilities and attend athletic events most often. Their behavior has the potential to be highly affected by our waste-reducing projects. If we implement a new system dealing with waste, it will affect the actions of the public—hopefully in a positive direction.

II. TIMELINE

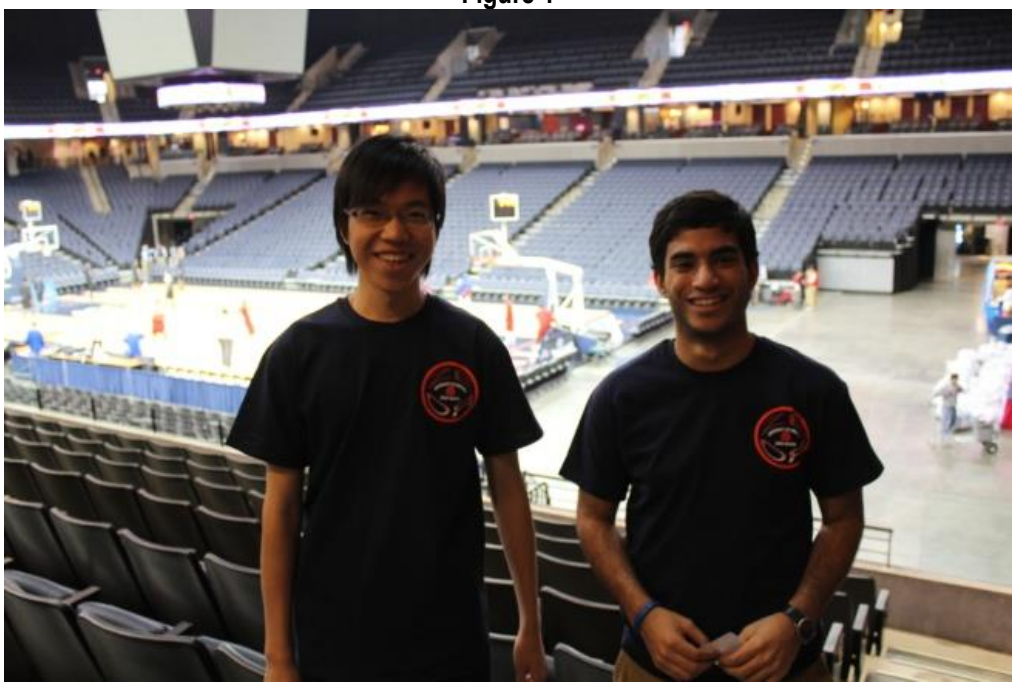

Zero-Waste Pilot Audit Project Timeline
Feb
March
April
May
Stage 1
Finalize Attendence
Document and Analyze
Make Individual edits on Google Doc
Finalize the rubric for Globetrotters
Prepare questions for Black Bear
Stage 2
Volunteer, observe, and record observations
Educational opportunity at Black Bear composting
Analyze the pilot event's performance
Develop metrics for success - Black Bear
Stage 3
Research methods of waste audits
Contact other universities/successful waste audits
Develop a report - expansion of project
Create a report and analysis (Black Bear)
Work on metrics for success - Black Bear
Work on promoting the expansion of the project
Divide work for the final project report
Stage 4
Finalize rough draft for the project report
Draft Project Report Due (April 3)
Collectively finalize final project report
Work on project poster
Project Poster Session (May 2)
Finalize project report
Final Project Report Due (May 4)

III. GLOBETROTTERS PILOT AUDIT AT THE JOHN PAUL JONES ARENA (JPJ)

The pilot audit took place on March 1st 2013, when the Harlem Globetrotters performed at JPJ. The Zero Waste team chose the Globetrotters event for the pilot audit because of its regulated audience size (5,000). The Globetrotters event was a small-scale event compared to normal basketball games or music concerts at JPJ. Only one-third of the arena was open to the public, which made it easier to determine errors and control the experiment.

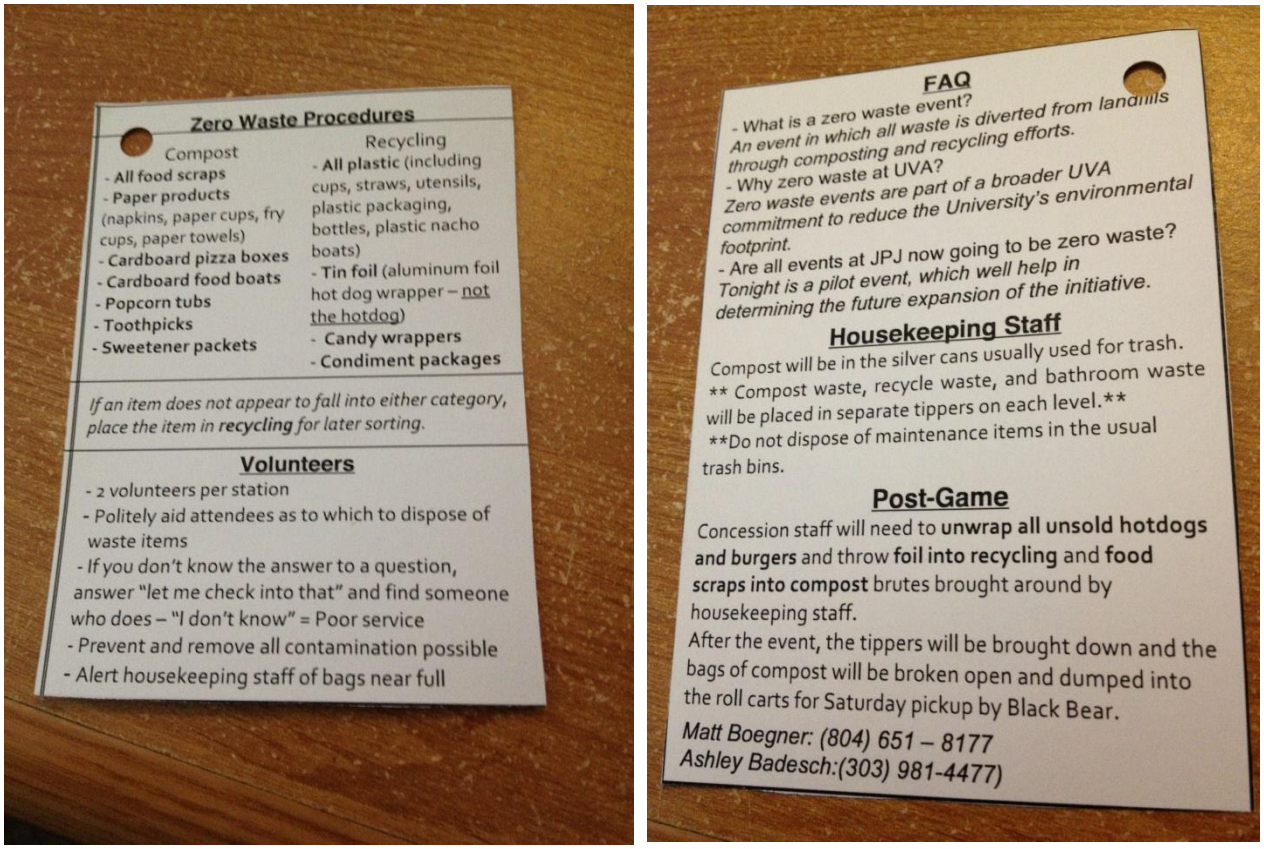
Our group arrived around 5:00pm, which was the first shift (Figure 1). The process of signing up went smoothly. Afterwards, Matt and Ashley distributed small flip-cards (Figure 2) and volunteer t-shirts. The flip-card summarized volunteer guidelines. Our group believes that Matt and Ashley could have better explained the flow of the event and volunteers' responsibilities, besides just using the flip-card. The flip-card was still a great idea, since it was small enough for volunteers to easily use when they encountered difficulties. The flip-card also clearly laid out the sorting of waste and frequently asked questions. Our group would like to suggest that Matt and Ashley email the flip-card to volunteers in advance, since we feel that the volunteers should be better prepared upon their arrival at the event. Sending out the flip-card would give volunteers a better sense of the recycling and composting procedures, as well as increase efficiency and time management at the actual event.

Figure 1



Adrian and George at the site of the Pilot Audit, preparing for attendees.

Figure 2



The Flip-Card acts as guidelines for volunteers

There were 20 recycling and composting stations in the stadium that night. One station consisted of one recycling bin and a composting bin separating the waste (Figure 3). There were also posters above each bin, indicating the type of waste for each bin (Figure 3). This process was similar to the University of Colorado's waste composition study that utilized large signs and zero waste "goalies" (see Precedent Research for more information). We found UVA's posters not appealing enough and slightly confusing. The fonts on the posters were too small and the imagery of waste was slightly blurry. Audience members might not have the attention span needed to scan through both posters to decide where to dump his or her waste. This is also the reason why there were two volunteers per station. The volunteers guided audience members on sorting the waste (Figure 4).

Figure 3

The set up for each waste station—posters contain general items with visual assistance.

Figure 4

Teaching an attendee about the differences between compostable and recyclable materials.

The Zero Waste Initiative aimed to have as many volunteers as possible, as inspired by other universities like the University of Colorado, which utilizes over 70 community volunteers at each event. Though large numbers of volunteers may be successful at other colleges, our group believes that two volunteers per station is unnecessary. Many stations are close to each other, such as there being 6 stations by one concessions shop. Our group proposed that several volunteers could be removed from an area similar to the 6 volunteers at that one concessions area, which would reduce the cost of hiring volunteers. Gloves were also distributed to volunteers, which we believe is necessary, as volunteers may need to physically sort out waste after the event (Figure 5). The gloves should be handed out earlier (during the briefing session) for time efficiency. There were two shifts of volunteers, which was not necessary, because their times overlapped. At one point, there were too many volunteers for the campaign. We would suggest for an event like this, one long shift or two shorter shifts.

Figure 5

Volunteers wore gloves and assisted to make sure that all waste was in the proper receptacle.

Our group also suggested using color to differentiate the two bins - recycling and composting instead of using posters, like the University of North Carolina (further explained in the Future Work section). Blue and Orange would be good colors since it suits UVA. This might be difficult to implement in some stations, since some bins are larger and located within bar tables. There should also be more marketing throughout the event. We noticed a small blurb continually appearing on-screen (Figure 6), but other than that, the zero waste campaign is not mentioned at all throughout the event. Our group proposed that the announcer should make announcements multiple times throughout the event.

Figure 6

TV screen in stadium showing the zero waste campaign.

Overall, the pilot event was a success, and Matt and Ashley were satisfied with the results. Without doubt, there is room for improvement, but our group believes as a pilot event, the turnout was good. The Zero Waste team also established good partnership with multiple parties, like the JPJ Arena, Black Bear Composting, and Aramark (UVA Catering Services). Audience members were happy with the campaign and believed it was a good green move for the University and Charlottesville community.

IV. EDUCATIONAL OPPORTUNITY AT BLACK BEAR COMPOSTING

Black Bear Composting is “an organics recycling company located in the Blue Ridge Mountains of Virginia” that seeks to reduce local organizations’ waste. Black Bear Composting recycles organic materials and turns them into healthy soil. We attended an educational opportunity to see how trash from the pilot audit at JPJ would be composted (Figure 7). Below are the process and data collection from our visit to Black Bear Composting.

Figure 7

Anessa, Adrian, and Katie with Matt & Ashley at the Composting site.

A series of photos from the general process: sort waste, weigh it, then transport it into the decomposing piles where it will eventually turn into reusable, nutrient-rich mulch to be sold back into the community.

1. Dumped trash out of each container into a large pile (Figure 8)
    - Each 10.5 container contains 65 gallons of trash.
    - Findings included (but were not limited to): a baseball cap, tons of popcorn, water bottles, plastic bags, aluminum foil, soda cans, plastic utensils, Cheerios, ranch packets (Figure 9)

Figure 8

Dumping trash out of each container into a large pile

Figure 9

Checking what are included in the compostables.

2. Used rakes to sort through the trash and take out items that are not compostable.
    - Non-compostable items included aluminum, plastic, gum, and electronic wires.

Figures 9 & 10

Using rakes to sort items that are not compostable

3. Determine the weight of a 5-gallon bucket of trash.
    - Sample a variety of all kinds of material, and fill the bucket halfway with this material.
    - Compact material in the bucket by dropping the bucket onto the ground 10 times.
    - Continue to fill the bucket until it is ⅔ full, then repeat the compacting procedure.
    - Finally, fill the bucket to its brim with trash.

4. Track the weight of the bucket with trash on a weight scale. (Figure 11)

Figure 11

Weighing a bucket of trash.

5. Calculations:
    - 5lbs bucket - 1lbs weight of bucket = 4lbs sample
    - → 160lbs/yard
    - → 3.38 cubic yards of materials
    - → 540.8lbs of waste overall***

6. Mix compostables with 2 yards of leaves and wood chips (per yard of waste).

7. Cover mixture and aim to keep temperature of mixture at 130 degrees. Breakdown process is evident when steam emanates from the mixture.

8. Over a 15-day period, mix the mixture with water via a “turner”

9. Continue to monitor and process the mixture for 6 weeks

- During this time, send a sample to the lab to ensure that the mixture is healthy (that there are no pathogens).

10. After the 6-week period, move the mixture to a curing pad for 4 months.

- Continually turn the mixture to make its particles smaller and to create a homogenous mix.

11. Final product will become soil/mulch.

12. Sell final product to farms, especially those specializing in small vegetables and herbs.
    - Target: the Charlottesville Community
    - N2 (Newcomb) uses Black Bear Composting for its waste

Significant design decisions:

For the pilot audit, compost would be placed in silver cans usually used for trash. Compost waste, recycle waste, and bathroom waste would be placed in separate tippers on each level (Figure 12).

Composting	Recycling	Other
● Food scraps ● Paper products (napkins, paper cups, paper towels) ● Cardboard (pizza boxes, food boats) ● Popcorn tubs ● Toothpicks ● Sweetener packets	● All plastic (cups, straws, utensils, plastic packaging, bottles, nacho boats) ● Tin foil, aluminum ● Candy wrappers ● Condiment packages	● Items that do not fall into the “composting” or “recycling” categories should be temporarily placed in “recycling” - until they are sorted at a later time.

Figure 12

The three major waste separating bins (trash, recycle, and compost).

V. ACCOMPLISHING OUR OBJECTIVES

We analyzed the pilot event's performance: flow of the whole event, waste collected, audience member's reactions, volunteers' reaction, Zero Waste team's evaluations and partners' evaluations. We determined our metrics for success by a combination of qualitative and quantitative data. We looked at the numbers from our waste audit and composting session with Black Bear, as well as assessed the receptivity of the general public and effectiveness of our advertising and event implementation at JPJ. Additionally, we researched other schools' waste audits to find improvements for UVA's Zero Waste Athletics program, which can be seen in the following section, Precedent Research.

VI. PRECEDENT RESEARCH

Ohio State University Stadium

The Ohio State University Stadium hosts the largest Zero Waste Project in the United States. They have shown consistent improvement in "landfill diversion" rates. Zero Waste is labeled when the measurement of diverted material is greater than 90%. Throughout the 2012 season, Zero Waste diverted 81.9% of materials up to its record 98.2 diversion rate on November 3rd, 2012.

Recommendations from OSU precedent to be implemented in UVA's Zero Waste Program:

- Develop "High Five Program" which rewards food vendor volunteers for successfully and accurately sorting compost and recycling materials. This program has observed approximately a 60% participation rate in the OSU stadium. At the Zero Waste Athletics Pilot Audit for UVA, it was obvious that partnership with existing vendors was not completely present. Improving this aspect of a zero waste event could greatly improve the success overall.

- Partner with rehabilitative services of Virginia, specifically in the Charlottesville Area; OSU partnership with the Ohio Department of Rehabilitation and Correction generated manpower as well as efficiency.

- Improve efficiency by small changes, such as "changing the color of the gloves, switching to compostable stirrers, and getting rid of disposable towels." Since we got to experience sorting trash firsthand, one of the comments consistently made throughout the process was the difficulty of distinguishing different categories of waste. Color-coding would be an easy and effective solution.

- Include youth "composting/recycling teams" and reward success accordingly. Especially since this first zero waste event was community-wide, there were many children present that could have played a bigger role in participation.

University of North Carolina, Charlotte – McColl-Richardson Field

The University of North Carolina Charlotte's campus is currently undergoing a similar process regarding implementing zero waste initiative in most athletic events. In September 2012, UNC Charlotte Secretary for Sustainability, Ellen Payne, announced the university's plans of making its McColl-Richardson Field completely zero waste. McColl–Richardson Field is the college football stadium. It is also the future home stadium of the 49ers football team representing the University of North Carolina at Charlotte.

The McColl-Richardson Field is currently still in development, and expected to open in late August this year for the 2013 Football Championship Subdivision Season. The stadium was initially designed to hold a seating capacity of 15,300 spectators, but it is able to expand to up to 40,000 or an extra 25,000 with the addition of temporary bleachers. UVA's Scott Stadium, which has a capacity of 61,500, is much larger than McColl- Richardson Field. Scott Stadium's larger capacity, along with its last renovation having been in the 1980s, makes it harder to implement some of UNC's developing zero waste facilities at UVA.

The McColl-Richardson Field will have composting and recycling bins, which are similar to the two-bin system in the zero waste pilot at JPJ. At McColl-Richardson Field, spectators are allowed to bring empty water bottles to the stadium. Our group believes that Scott Stadium or other athletic events should allow this. UNC's stadium also implemented new eco-friendly water fountains. These water-bottle stations are funded by UNC's Charlotte Green Initiative. Charlotte Green Initiative's budget comes from every student at UNC Charlotte enrolled in 12 or more credit hours. Each student pays $1 towards the green fund.

The vendors at the McColl-Richardson Field are also required to use only products that produce waste that is either compostable or recyclable ("ecoware"), such as plates and utensils. Payne mentioned "Every initiative that we do, I want there to be an educational side to them." The Charlotte Green Initiative is also planning to set up a "Green Zone" in athletic events as an educational corner for spectators (Facebook). This Green Zone will also give out merchandise and pamphlets. Our group believes both JPJ and Scott Stadium could implement something similar with the environment clubs on Grounds. This is a good way to educate local community members about being sustainable.

University of Colorado

The University of Colorado's zero waste program, known as Ralphie's Green Stampede, competes in the EPA's Game Day Challenge to score the most recycling and waste reduction during football games. Through the Rocky Mountain Greener Venues Partnership, which assists large venues in improving sustainability, the Green Stampede employs the help of White Wave Foods, Inc.

The Green Stampede aims to reach a minimum landfill diversion rate of 90% during game day operations. To achieve this, the university:

- Conducted a full waste composition study during a game. As fans entered the stadium, they noticed recycling initiatives like large signs, zero waste "goalies" (reminding people where to dispose their trash), recycling and compost bins, and compostable or recyclable serving-ware.

- The CU Athletic Department, Boulder Sports Properties (BSP), and the Environmental Center distributed various public announcements about the EPA Game Day Challenge and the Green Stampede.
    - E.g. weekly emails to ticket holders, press releases, advertisements on the jumbo-tron

- Over 70 community volunteers helped to sort materials, educate public participants, and set up bins for the game.

- CenterPlate staff continued to sort materials in the kitchens and public serving areas in order to help maintain high diversion rates.

- ROTC teams successfully sorted materials during the stadium clean-up the following day

The University of Colorado recognizes opportunities for improvement, such as:

- Establish standard setup plan and appropriate deadlines in order to improve efficiency

- Work with vendors to ensure that all locations have proper bins and that their staff members are trained on basic sorting procedures

- Ensure that custodial teams are familiar with appropriate bin-liner pairings

Arizona State University

Ditch the Dumpster- Rather than having dumpsters outside of dorms for students to throw away unwanted stuff, there are rooms for larger items to be placed aside that will be taken away later, with different sized bins for the smaller items. There are three different categories for these bins:

- Smaller Items
    - Clothing, shoes, and accessories
    - Books, hangers, and storage bins
    - Smaller household goods
    - Smaller appliances (usable or not)
- Larger items
    - Furniture
    - Lamps and egg-crate mattress pads
    - Larger appliances and electronics (usable or not)
    - Tightly-closed detergents or cleansers
    - Unopened, nonperishable food
- Recyclables
    - Paper
    - Cardboard
    - Plastic
    - Metal

Composting

- ASU sends its waste to the nearby Singh Farms, similar to Blackbear Composting in Virginia. In return, Singh Farms sends back nutrient-rich material to be used for campus landscaping and the campus gardens
    - Close to a half-million pounds of plant clippings have been diverted in five years
    - University has saved about $20,000 in dumping fees
    - The farms and campus gardens then supply nearby restaurants markets
    - They're using Aramark to recycle more kitchen waste in dining halls
        - All their food, including meat and dairy products can be composted
        - Their paper food service items are compostable

EPA's Food Recovery Challenge

- Started in 2010 to save money and reduce waste
- Goal is to raise awareness about the amount of food unnecessarily thrown in the trash, and how to avoid it
- Steps for the participants or groups
    - Conduct an assessment of their current practice
    - Set a goal for reducing the amount of food waste
    - Commit to a more sustainable approach

- EPA has started to work with industries, colleges, universities, and sports venues
    - MGM resorts
    - Middlebury College
    - University of Texas at Arlington
    - ASU is one of 59 universities across the country
        - Incentives also include EPA awards to the universities

Water Conversation

- Low-flow Fixtures
    - Installation of these fixtures in sinks, showers, toilets, and waterless urinals can save up to 30% on water
- Landscaping Water Conversation
    - Switched to watering plants at night to avoid evaporation, and wasted water
    - Working to automate watering of plants based on current weather conditions and "evapotranspiration rate"

University of Southern California

The University has many programs promoting sustainability on campus, like dorm programs, recycling, and sustainability at dining halls. In terms of zero waste, there is a way for tailgates to become zero waste certified with help from the office of sustainability. They will assist in choosing reusable materials as well as recycling or composting of these materials.

They are also holding a dorm "move out" waste diversion so that when students move out of dorms, not everything is thrown in the trash. Their website is very informative and it seems easy to get involved with the USC sustainability program.

Oakland Athletics Stadium

A Partnership with StopWaste has made the Oakland McAfee Coliseum one of the greenest sporting venues in the country. It is the first major league venue to use compostable cups as opposed to plastic ones. They also switched to corn based utensils that are compostable. There were challenges with sorting, especially when fans left their cups and other items in the stands. The clean-up crews needed very specific training in order to be able to minimize contamination of the different streams of waste.

- California state-wide initiative toward zero waste
- Coliseum supports up to 62,000 people
- Established partnerships with vendors in order to achieve their goal
- Grass clippings, landscape trimmings and kitchen food waste is also collected for composting

VII. ALTERNATIVES CONSIDERED

Royal Oak Farm, LLC owns and operates the largest solid waste composting operation in the state of Virginia. It is located in Evington, VA and managed by a full-time staff of 13 people over a 115-acre property. Location-wise, Royal Oak Farm is less convenient than Black Bear Composting. Whereas Black Bear Composting is about a 45-minute drive from Central Grounds, Royal Oak Farm is at least an hour and a half drive.

As suggested by the owners of Black Bear Composting (as well as implemented by Ohio State University), potential future volunteers for pilot audits could include youth delinquents. Not only would the pilot audits build these kids' characters, but the Zero Waste Initiative would also benefit from having volunteers at each pilot audit. Zero Waste could also mimic the University of Colorado's ROTC efforts to become more involved in sustainability by utilizing ROTC members as volunteers for both pilot audits.

VIII. FUTURE WORK

Moving forward, a larger scale pilot will be conducted, most likely in the fall due to scheduling at JPJ. There were about 5,000 people in attendance at the Harlem Globetrotters event, which was good for an initial trial of zero waste, but the capacity at JPJ is over 15,000. A larger scale event at JPJ will provide even more useful data for the project. In mirroring the University of Colorado and Arizona State University's successes at zero waste, the University of Virginia is also considering participation in the EPA game day challenge at Scott Stadium (see Research Precedents for more information).

Future work includes several revisions to pilot audits. Number of bins, as well as their placement, will be revised based on the flow of people in the arena and the results of the pilot audit. In terms of volunteers, it was found that not as many will be required at future events, seeing as they were the largest expense. The shifts for volunteers will change based on the fact that, before and during the first half of the pilot audit at JPJ, very few people were throwing away trash. Furthermore, the use of plastic nacho boats will be advocated for change. A lot of the contamination in the pilot audit was due to nacho cheese on recyclable items. Cardboard nacho boats would be compostable, as opposed to plastic ones that must be thrown away due to contamination. Scott Stadium and JPJ could encourage students to bring their own utensils, such as reusable mugs. Encouraging students to bring their own UVA cups could not only reduce waste at athletic games but also boost bookstore's sales, which is a win-win situation. At the Oakland Athletics stadium compostable cups and corn-based, compostable utensils have been implemented through partnerships with food vendors. The kitchen waste, grass clippings and landscape trimmings are also composted, creating a zero waste environment in every aspect of the arena. This concept could also be realized at JPJ in order to eliminate waste not only from audience members, but also from vendors and maintenance staff.

The pilot game was not advertised much to the public. If the results were gathered without prior knowledge of those in attendance, even better results might be expected if people are warned about the zero waste goal of the event. Zero Waste Athletics' future work should include increasing advertising awareness of zero waste and sustainability. Weekly emails to ticket holders, press releases, and advertisements on the athletic jumbo-tron, are just a few methods the University of Virginia can utilize to increase awareness of the Zero Waste Initiative. These public announcements were successfully implemented by the University of Colorado's Athletic Department, with help from their Boulder Sports Properties and Environmental Center. If UVA were to encourage its sponsors to aid in distributing public announcements about Zero Waste at athletic events, then much more people in the Charlottesville community would become aware of such efforts.

Little has been done to save water usage, and it is time to implement a change. Scott Stadium or JPJ Arena could mirror the eco-friendly water fountain from UNC Charlotte. These spouts are designed to encourage students to refill their water bottles by allowing them to place their bottle on an upper level of the fountain, using laser sensory that will automatically fill the bottle without spillage. This type of water fountain is currently not found on Grounds and our team believes that UVA/UVA facilities management could use these fountains in some on-grounds facilities.

Lastly, our group believes that creating a sustainable environment at UVA is every Wahoo's responsibility. Being a global citizen is one of the core values at being a member of the UVA community. Following UNC Charlotte's sustainability campaign, contributing $1 per student could be something that UVA Sustainability looks into with Admissions. This funding could be used to enhance the sustainability aspect of facilities on Grounds, such as the Dell, dining halls, or various buildings.

IX. LESSONS LEARNED

After researching different precedents, we learned of the different materials and methods that other schools have implemented very successfully. The leading program at Ohio State University called for numerous volunteers. As a group, however, we realized that it is not necessary to have nearly so many volunteers working throughout the whole event because a lot of the money from the zero waste program goes towards grants that support the volunteer groups. The volunteers found that they were not very busy throughout the game until halftime came around. That is the more important time to bring volunteers out, and most likely the only time volunteers will ever be needed at any pilot event.

Research precedents from the University of North Carolina and Ohio State University precedents, as well as first-hand experience at UVA, taught the significance of color coding the different types of waste, whether it is recyclable or compostable, which could potentially replace the volunteers needed to ensure proper waste separation. If spectators could identify a specific color or shape with the respective bin (composting or recycling), it would be much more efficient and we could even eliminate the need for volunteers. We suggest using University of North Carolina's method of using two bins with two colors (for example, blue and orange for UVA), so spectators could easily distinguish the bins. Additionally, creating a color-coding system for actual items like that of Ohio State University (e.g. gloves) would simplify the trash-sorting process even further.

The educational opportunity at Black Bear Composting could also be beneficial for staff members and vendors involved with Zero Waste. In following the University of Colorado and Oakland Athletics' educational methods for their staffs, UVA should ensure that its vendors and staff members are trained on basic sorting procedures. By also ensuring that staff attend the educational opportunity at Black Bear Composting, the staff will gain a better sense of how their hard work reaches its final product, motivating them to work harder and raise awareness about the Zero Waste Campaign.

The lessons we ourselves learned at Black Bear Composting were inspirational. Beforehand, we could not imagine how popcorn holders and soda cups could be turned into fertilizer for soil and planting. It was fascinating to see how waste could transform into something valuable. This opportunity also made us reflect on our own daily activities, such as how we could utilize waste and turn it into something that would not only benefit us, but also our community. If most of our waste does not go to landfill, the carbon dioxide emission from landfills will be significantly reduced. We could also enjoy fertilizer and better-grown vegetables at a cheaper cost, similar to the way that Arizona State University has been in constant interaction with their nearby composting sites. By sending their waste to be composted, they get the nutrient rich material back, and that is then used in their campus landscaping and gardens. If UVA were able to create a similar relationship with Blackbear Composting, this would help our local farmers and food markets grow.

X. COSTS, BUDGET, AND FUNDING

Our think global/act local project does not have a specific budget, and we do not foresee that we would incur any costs in the future. The actual Pilot Audit involves costs incurred, which we have discussed with both Ashley and Matt. Below are specific costs that are likely to incur, as well as potential sources for future funding.

The costs incurred are estimated from previous research of successful precedents. To ensure a proper waste diversion and to appeal to target audience members, clear signage and visible assistants at waste stations are required. To increase the awareness of the pilot, prominent publicity like promotional videos and t-shirts are necessary. There will be a two-stream (recycling and composting) disposal system, which requires all products sold within the arena to be compostable or recyclable, so additional costs are incurred from the product conversion process. Black Bear Composting must also execute the compost stream. The total estimated costs are $4848.

Our funding sources include the $500 Grand Prize in the Student Sustainability Projects Poster Contest in Spring 2011. This will be allocated towards the t-shirt costs for volunteers operating waste stations. Brent Beringer, UVA. Dining Services Director, has agreed to pay the costs associated with hiring volunteers to operate the waste stations and educate the public during pilot events. We plan to contract Student Sustainability groups to work during the games and estimate the costs at 30 volunteers, working 5 hours a game for $7/hr. The total cost for hiring volunteers is $1050. We also received $5000 in grant money from the UVA Parent's Committee, which is to be used toward the Zero Waste Football pilot at Scott Stadium in the fall of 2013.

There will be a remaining funding of $1202, and this remaining funding will be used towards other pilot projects in the upcoming school year. The budget proposal can be seen in the next page.

Budget for Zero Waste Athletics Initiative

A. Funding Sources	$	Total $
U.Va. Dining Services sponsorship	1050	
U.Va. Parent's Committee sponsorship	5000	6050
B. Incurred Costs		
One-time Sinage		
20 stations x $40	2000	
Promotional Video	250	
One-time Waste Receptacles		
Repurposing of current trash receptacles for compost	1920	
Product Conversion	400	
Compost Pickup		
One-time set up fee (10 carts x $10)	100	
Cart Pickup (20 carts x $8.9)	178	4848
C. Alternative Funded Costs		
T-shirts for volunteers (50 x $10 t-shirts)		500
Total Funding (A)		6050
Total Incurred Costs (B)		4848
Remainding Funding (A-B)		1202
Total Alternative Funded Costs		500

XI. CONCLUSION

Overall, the Zero Waste Pilot Audit was a successful first attempt at hosting such an event on the grounds of the University of Virginia. Quantitatively, the numbers from the composting center prove the potential of composting at events with large attendance. Qualitatively, the receptiveness of the goals of the group was obvious. Adults and children alike took the time to read the information available and choose where to place their trash accordingly.

While there were many successes in this "trial run," limitations do exist. Specifically, funding and manpower are two major parts of rendering another larger-scale zero waste athletic event. With the combination of continued support, effective advertising and sufficient funding, Zero Waste Athletics, as well as our Global Sustainability group, look forward to developing future projects.

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