Roadmap to Zero Waste: A Comprehensive Toolkit to Waste Management at



Presented by

ENVS 620: Sustainability Consulting and Leadership Development December 10, 2015



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Acknowledgments

This project came about as a result of a student interest group on waste, formed with good intentions, which never seemed to launch. Our professor, Dr. Brooke Moran, facing a last minute change in her class plan, asked us (her class) what we would like to do for our semester consulting project. Through a team brainstorm, and with the leadership of Sam Kozel, the idea of researching what it would take for Western to become a zero waste campus came forth. It was from this place that we started down the road of the first comprehensive benchmark of Western's waste stream.

This work would not have been possible without the groundwork laid by Western's Facilities services, and the continued commitment of Nathan King, Campus Sustainability Coordinator. It was a truly enlightening experience as Western Student's we wanted to see what fills our thrash cans and what is not making it to the recycling or compost bin.

As a campus, we are lucky to host a culture of sustainability, an ethic shared by students and faculty alike. It was because of the support of so many different individuals – from the Center for Environment and Sustainability, to Sodexo Food Services, to various campus engagement offices and our professor herself— that we were able to succeed in this benchmark study in just one semester.

It is our hope that this report will lay the groundwork for future shifts on campus that will get us closer to the ultimate goal of campus zero waste. It will be through continued strong partnerships among engaged students and Western Staff and faculty that changes will become institutionalized.

We would like to thank the following people directly for their time: Bryce Hanna, Dr. Brooke Moran, Jon Coady, Nathan King, Sara Phillips, Dr. Jonathan Coop, Dr. Abel Chavez, Cody Washka, Erin Griffin, Ayodeji Oluwalana, and Chevy Mohr.



Team Members (left to right) Zach Vaughter, Stephanie Aubert, Alyssa Vogan, Cassidy Tawse-Garcia and Sam Kozel at the 2015 ENVS Fall Forum, presenting our project to the campus community.

1.0 Executive Summary

The following study is presented as a toolkit of recommendations for Western State Colorado University (Western) to increase its' waste diversion rate on the pathway toward achieving zero waste on campus. Zero Waste is a whole systems approach to waste and materials management to realize 90% waste diversion from landfills, with benchmarks of 50% and 70% diversion rates along the way (IZWA, 2009). After thorough examination of the Western waste stream by our research team, this toolkit presents results and recommendations.

This toolkit considers the following sub-components as the total makeup of the Western waste stream: solid waste collection; recycling; food waste and food scrap compost; custodial and office purchasing; as well as waste generated by Facilities services. The first step of this effort required establishing baselines of Western's waste stream via various auditing procedures described in detail further in the report.

In one academic calendar year (32 weeks) Western generates 633,645 pounds of waste; 480,577 pounds of this are sent to landfill, for a waste diversion rate of 24.16%. If Western were maximizing its current waste infrastructure (meaning all waste was properly sorted to existing recycling, compost, e-waste, TerraCycle and FreeCylce infrastructure on campus) Western would achieve a 71.18% waste diversion rate. This would keep 298,000 pounds of waste out of the landfill each year. The amount of waste Western sends to landfill in one academic year is enough to cover the 'W' on Tenderfoot Mountain 4.2 times, or the equivalent of 2 football fields, one-foot deep in trash.

The path for Western to reach it's current potential diversion rate (71.18%) is through removing recyclable items from landfill. On average, 45.8% of each on-campus building's waste stream consists of recyclables; while another 15% of each buildings waste stream consists of paper hand towels from restrooms. Western throws away 431 cubic yards of paper towels every school year; the equivalent of half of the 'W,' covered one-foot deep. If existing recyclables, paper towels, and food compost were removed from Western's waste stream, 358,000 kg CO_2E would be reduced from the atmosphere (EPA WARM), offsetting 4% of campus greenhouse gas emissions or the equivalent of one year's worth of energy-use (electricity and natural gas) at the Savage Library.

In addition to the environmental benefits of pursuing zero waste, there are potential financial savings. Contributions to this saving include reduced purchasing of office, food & beverage, and custodial supplies, reduced costs in waste management contracts, and opportunities for new revenue streams from selling various waste outputs. For example, if Toolkit recommendations were implemented, (approximately) \$14,000 in savings per school year, would become available to further sustainability on campus.

This Zero-Waste Toolkit provides a road map for Western becoming a sustainability-leader among academic institutions, particularly in Colorado, through tangible recommendations to (1) reduce waste, (2) increase engagement, and (3) demonstrate environmental best practices. The Toolkit

boldly integrates and maximizes existing Western sustainability practices, while exploring innovative ways to engage all employees and students in the zero waste journey.

2.0 Introduction and Background

2.1 Introduction

During the Fall 2015 semester, Dr. Brooke Moran's ENVS 620 Sustainability Consulting and Leadership Development class investigated Western's waste stream with the goal of institutionalizing zero waste initiatives on campus. To do so, the class established baselines of campus waste streams quantified in total pounds per year of various materials (e.g. plastic, solid waste, compost, aluminum) and current waste diversion rates. Zero waste is defined by the International Zero Waste Alliance is the process of removing 90% your waste stream from landfills and incinerators, with benchmarks of 50% and 70% along the way. Zero Waste means designing and managing products and processes to systematically avoid and eliminate the volume and toxicity of waste and materials, conserve and recover all resources, and not burn or bury them. Implementing Zero Waste will eliminate all discharges to land, water or air that are a threat to planetary, human, animal or plant health.

The Toolkit's methodology is outlined in Section 5.0, detailing results from the waste, food and purchasing audits. Improving Western's diversion rates will require a shift in campus culture and buy-in from the campus community. Section 6.0 creates a potential communications plan that Western could utilize to increase such efforts. This plan outlines social media outreach, new student and staff orientation engagement, marketing materials, current campus initiatives, as well as providing other universities' best waste practices. The report finishes with a toolkit of 21 recommendations to improve Western's diversion rate.

2.2 Campus Background

Western State Colorado University (Western) is a public higher education institution, with an enrollment of 2,539 students and 214 employees. Located in Gunnison, Colorado, Western's campus is nestled in the Colorado Rocky Mountains and sits at approximately 7,700 feet and is located at 38.5493° N, 106.9185° W in Gunnison County.

WESTERN STATE COLORADO UNIVERSITY's Institutional Mission

Western State Colorado University fulfills its statutory mission by promoting intellectual maturity and personal growth in its students and graduates citizens prepared to assume constructive roles in local, national, and global communities. Western helps its students to develop the skills and commitments needed to continue learning for the rest of their lives and strives to elucidate the connections unifying academic domains which have traditionally existed separately: the sciences, the liberal arts, and professional programs. The University provides students with a solid foundation of skills in written and spoken communication, problem solving, critical thinking, and creativity. Our programs encourage a breadth and depth of knowledge, which will serve as a foundation for a professional career or graduate study, and an appreciation of values appropriate to a liberally educated individual. Western's distinctive character emerges from its unity among academic and professional disciplines, its high standards of scholarship, and its unique environment in the mountains of western Colorado.

Western's campus sits in a rural setting and covers ~350 acres in Gunnison, Colorado. The institution was established in 1901 and opened for classes in 1911 as the *Colorado State Normal School*, the first college on Colorado's Western Slope. This initial focus as a preparatory college for teachers resulted in a commitment to teacher preparation programs that continues to today. In 1923 the college's name was changed to *Western State College of Colorado* in recognition of its expanding programs in the liberal arts at both undergraduate and graduate levels. Western State Colorado University utilizes a semester-based academic calendar and offers State of Colorado accredited undergraduate and graduate degrees. In 2012, the institution's name was changed to Western State Colorado University. In 2014, Western's Center for Environment and Sustainability added a graduate program, the Masters in Environmental Management (MEM), adding 70 graduate students to the campus community over two years.

2.3 Student Body Demographics

Western's student body is comprised of \sim 2,200 undergraduate students and \sim 200 graduate students. Western's gender distribution is 58.4% male and 41.6% female. The student-faculty ratio at Western is 17:1, and the school has 53.6% of its classes with fewer than 20 students.

Western offers degrees in 67 undergraduate programs and 3 graduate programs. The most popular majors at Western State Colorado University include: Business, Management, Marketing, and Related Support Services; Parks, Recreation, Leisure, and Fitness Studies; Biological and Biomedical Sciences; Social Sciences; and Psychology.

The average freshman retention rate, an indicator of student satisfaction, is 66.3%. Student to Faculty Ratio: 17:1. Four-year Graduation Rate: 19%.

2.4 Staff Demographics

Western is one of the largest employers in Gunnison, Colorado. The University employs \sim 140 academic and athletic staff and employs approximately an additional 200 institutional staff.





Choose to Reuse

Sodexo, in partnership with Western and the Student Sustainability Coalition, has implemented Choose to Re-Use as our "Meal Replacement" program in the Rare Air Café.

This new program allows students to take a meal to-go for those times when classes or Athletic events conflict with meal times.

The Choose to Re-use boxes and mugs allow a larger variety of foods to be chosen while helping Western to reduce Non-Organic Waste.

GO GREEN Western!



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5.0 Benchmark Development and Methods

5.1 Definitions

- Zero Waste: Ninety percent of waste generated on campus is diverted from landfill end-of-life.
- *Waste Diversion:* Diverting waste from landfill through any means including but not limited to recycling, composting, reusing, behavior change and culture change.
- *Diversion Rate:* Amount of waste that is diverted from the landfill via the above mentioned methods.
- *Waste Aversion:* Avoiding the generation of landfill waste through sustainable and responsible purchasing practices.
- *Freecycle:* Established and maintained by students and located in the basement of Ute Hall, a place to find or donate unwanted but useful items such as clothing, school supplies, furniture, household goods, and much more.
- *Plastics 1 & 2:* Currently the only two types of plastic accepted by the Gunnison County Recycling Facility.
- *Terracycle*: A small business located in New Jersey that manufactures new products from materials otherwise sent to the landfill. Provides incentives for non-profit organizations and schools in exchange for their "trash". See section 4.2.1.
- *Organic Compost:* A nutrient-rich humus material resulting from the decomposition of organic materials such as food waste or dead leaves.
- Industrial Compost: Paper towels
- *Procurement Card*: State issued credit card issued to purchasers for state institutions.
- *Waste Stream Composition:* The aggregate of the various components (e.g. plastics, aluminum, glass, compost, industrial compost, tin, e-waste, terracycle, solid waste) of the WESTERN STATE COLORADO UNIVERSITY waste stream.
- *Sustainability Coordinators:* Undergraduate students funded by the LEAD office that are devoted to sustainability initiatives within residence life and dining services.
- *Behavior Assessment:* A strategy to assess when and why behaviors are likely to happen. Relating to waste, this assessment is meant to determine student, staff and faculty behaviors that occur, leading them to either take advantage of or ignore waste diversion infrastructure.
- *LEAD Office:* Leadership, Engagement and Development is a campus department focusing on student leadership opportunities focused on engaging students and the citywide community.
- *Roll-Off:* Waste collected from around campus (typically at the end of the semester) that does not fit within provided dumpsters on campus. This typically includes furniture and large electronics, such as televisions.
- *Earth Tub:* A composting unit built specifically for onsite composting of non-green feed stocks such as cafeteria food discards and compostable napkins.
- *Engagement:* The act of engaging a specified audience through outreach, communication and marketing initiatives. Engagement occurs when there is a specific goal for progress or change identified, and a plan is laid out to reach said goal.

5.2 Waste Audit

Performing a campus wide waste audit is a necessary first step for any campus aiming to become zero-waste. Through a waste audit, a campus is able to compute baseline data for the current amount of waste generated as well as identify what types of wastes are being generated at different building types (academic, athletic, residential, etc.). This information allows for the calculation of a campus' aversion and diversion potentials. Additionally, a waste audit informs where to initially focus efforts in order to be most economically efficient.

The Sustainability Consulting and Leadership Development group completed two separate campus waste audits on October 30, 2015 and November 10, 2015. The purpose of this study was to examine the composition of waste streams being generated at each type of building on campus: residential, academic and athletic. Following the audits, data was analyzed and used to provide baseline data to the user of this toolkit. The following sections outline the methodology, results, baseline data discussion and recommendations from the waste audit.

5.2.1 Methodology

Methodology for the waste audits was developed using the Dalhousie University Office of Sustainability Waste Audit Procedures. The document identifies three major components of a waste audit: preparation; sorting, recording and cleanup; and analysis.

Preparation

The following steps were taken in preparation for the waste audits:

- 1. Contacted campus facilities to obtain a map of dumpster locations
- 2. Requested a suitable facility to sort waste.
- 3. Identified the material streams and buildings to be audited.
- 4. Verified participants for the audit.
- 5. Procured proper safety attire.

Sorting, Recording and Cleanup

Audit #1

October 30, 2015 Audit Coordinator: Sam Kozel Sorters: Cassidy Tawse-Garcia, Zach Vaughter, Alyssa Vogan Buildings Audited: Pinnacles Residential Complex, Taylor Hall



Audit #2 November 10, 2015 Audit Coordinator: Sam Kozel Sorters: Stephanie Aubert, Tyler Grimes, Cassidy-Tawse Garcia, and Alyssa Vogan Buildings Audited: Hurst and Kelley Hall (shared dumpster), Paul Wright Gym/Fieldhouse

The collection process required driving to each dumpster and collecting an approximately 15 - 30% sample size of the total waste stream that was present. The collected waste was then taken to a work bay provided by Campus Facilities at the Whipp building.

Each building's trash was sorted and recorded separately on a large tarp. The waste stream was separated into the following material streams:

- Municipal Solid Waste
- Plastics #1 & #2
- Cardboard
- Aluminum
- Paper
- Industrial Compost
- Compost
- Glass
- TerraCycle (Plastic #6)
- E-Waste

The initial cubic yardage of the entire sample size was recorded in Excel. Each sample was then sorted by material stream into large plastic bins. All sorters wore hazmat suits, gloves, safety goggles and face masks. Once a building's entire sample was sorted the cubic yardage of each separated material stream was recorded in Excel.

Cleanup included disposing of each waste stream in their proper receptacle on campus, collecting all sorting bins, cleaning the tarp and ensuring the bay was in its initial state prior to the audit.

5.2.2 Analysis

The data collected has been extrapolated to compute the average total waste per year by building type (residential, academic, gym) and material type (e.g. plastic, glass, aluminum, etc). Nathan King and the Facilities Services, in coordination with Waste Management Services, conducted a waste audit in October 2014 to calculate the total volume of cubic yards of waste collection per building per week. This number is cited, and divided by each buildings audit sample volume (yd³) to normalize and calculate data for each building's sample. The resulting number is then multiplied by the percentage composition of each sorted material (e.g. plastic, glass, aluminum, paper, etc.) to calculate the total volume (yd³) of each sorted material's volume per building per week.

Once the weekly volume for each segment of Western's waste stream is calculated, EPA's *Measuring Recycling, A Guide to Local Governments* volume to waste conversion table is cited. To calculate the total weight in pounds per week and pounds per academic year the volume of each material stream is multiplied by the appropriate conversion number shown in Table 1.

Solid Waste	90	lbs/yd ³
Plastics (Bottles)	36	lbs/yd ³
Cardboard	100	lbs/yd ³
Industrial Compost	90	lbs/yd ³
Aluminum (Cans)	63	lbs/yd ³
Tin	32	lbs/yd ³
Compost (food scrap)	200	lbs/yd ³
Paper (Office)	484	lbs/yd ³
Glass	600	lbs/yd ³
E-Waste	90	lbs/yd ³
# 6 Terracycle	36	lbs/yd ³

Table 1. Volume to weight conversion numbers used in this report. Conversion numbers are sourced from EPA and Game Day Challenge.

5.2.3 Findings and Discussion

The composition of Western's waste stream listed as percentage of total, volume per week and weight per year by building type is listed below. The average potential waste stream diversion rate (61.85%) is calculated by averaging the diversion rate for each building type (60% Res life, 61.81% Academic, and 63.73% Gym). The average potential diversion number is used to calculate the potential diversion (in pounds) per building per year.

Residential Life Buildings

The ENVS 620 audit sampled the Pinnacles, an apartment style dormitory complex oncampus at Western. The Pinnacles dumpsters are collected three times a week (M, W, F). Once sorted for stream composition, the audit sample totaled 0.456 yd³ of 19.51 yd³ per week.





Figure 1 shows ENVS 620 waste audit results as percent of the total audit sample for the Pinnacles Complex. Completed October 30, 2015.

The results from the 620 audit (hereafter we refer to the auditing process) reveal that the potential diversion rate for the Pinnacles complex is **60%**. This number is calculated by subtracting the solid waste component (40%) from the total waste stream. Everything else that was treated as trash (cardboard, plastics, compost, tin, aluminum, etc.) can be recycled, composted or averted from the total waste stream. Once extrapolated to all residential life buildings, the potential diversion rate becomes **59.9%**.

Table 2 shows results from the Pinnacles audit extrapolated over the 32 week academic year and presented as an average for all residential building's (Robidioux, Crystal, Pinnacles, Mears, Dolores) waste stream.

Res Hall	yd ³ (Sample)	% Sample	yd ³ / Week	Lbs /Week	Lbs /
Building					Academic Year
(Pinnacles)					
Solid Waste	0.183	40.10%	6.456	581.00	18,591.90
Plastics	0.098	21.47%	3.457	124.45	3,982.53
Cardboard	0.075	16.43%	2.646	264.57	8,466.26
Industrial	0.0331	7.25%	1.168	105.09	3,362.80
Compost					
Aluminum	0.023	5.04%	0.811	51.12	1,635.68
Compost	0.0158	3.46%	0.557	111.47	3,567.12
Tin	0.0116	2.54%	0.409	61.38	1,964.17
Paper	0.0087	1.91%	0.307	148.54	4,753.30
Glass	0.0082	1.80%	0.289	173.56	5,553.87
Total	<mark>0.4564</mark>	<mark>100.00%</mark>	<mark>16.100</mark>	<mark>1,621.18</mark>	<mark>51,877.61</mark>

To calculate the average waste collection in yd³ for residential hall buildings, the average yd³ per week of Robidioux, Crystal, Pinnacles, Mears and Dolores Complex's is computed - This number 16.1 yd³, becomes the baseline for average residential hall waste collection. The results for waste stream composition (%), yd³ / week, pounds per week, and pounds per academic year are listed in Table 2. For the sake of this report, the assumption is that each residential hall has the same composition rate. From these assumptions Western's residential buildings collect **259,388.07** lbs/academic year with the potential to divert **160,820** lbs/year. *51,877.61* lbs/year x **5** (Robidioux, Crystal, Pinnacles, Mears, Dolores) buildings = 259,388.07 lbs/ year; 259,988.07 x 0.62 = 160,820 lbs/ year diversion potential.

Academic Buildings

The ENVS 620 Audit sampled Taylor, Hurst and Kelly Hall's waste streams. (*Note that Kelly and Hurst Hall share a dumpster*). Each dumpster is collected once a week, on Friday, at an average collection rate of 6 yd³ per week. To calculate academic yearly data for academic buildings the average stream composition rates of Hurst/Kelly and Taylor dumpsters is computed. Once sorted for stream composition, the audit sample totaled 1.673 yd³ of 12 yd³ (6 Kelly/Hurst and 6 Taylor) combined and averaged for stream volume and composition.



Figure 2 shows the combined composition as percent of the total audit for Taylor and Hurst/Kelly Hall. Completed October 30, 2015 and November 10, 2015.

The results reveal that academic buildings have a potential diversion rate of 61.81%. This number is calculated by subtracting the solid waste component (38.19%) from the total waste stream. This rate represents an average of three on-campus academic buildings; the numbers are then extrapolated to calculate all on-campus academic buildings waste streams (Taylor, Hurst/Kelly, and Quigley). *Note that the Borrick building's waste is deposited in the Robidioux Complex dumpster.*

Table 3 shows results from the Hurst/Kelly and Taylor audit extrapolated over the 32 week academic year, and presented as an average for all academic building's (Taylor, Hurst/Kelly and Quigley) waste stream.

Academic Building (average)	yd ³ (Sample)	% Sample	yd ³ / Week	Lbs/Week	lbs / Academic Year
Solid Waste	0.639	38.19%	2.292	206.25	6,600.07
Plastics	0.333	19.90%	1.194	42.99	1,375.79
Cardboard	0.11	6.58%	0.395	39.45	1,262.40
Aluminum	0.022	1.32%	0.079	4.97	159.06
Industrial Compost	0.402	24.03%	1.442	129.75	4,152.16
Compost	0.025	1.49%	0.090	17.93	573.82
Glass	0.003	0.18%	0.011	6.46	206.58
Paper	0.13	7.77%	0.466	225.65	7,220.94
#6 Terracycle	0.009	0.54%	0.032	1.16	37.18
Total:	<mark>1.673</mark>	<mark>100.00%</mark>	<mark>6.000</mark>	<mark>674.63</mark>	<mark>21,588.01</mark>

The results for average waste stream composition (%), yd^3 per week, pounds per week, and pounds per academic year are listed in Table 3. From these results Western's academic buildings (Quigley, Taylor, Hurst/Kelly) collect **64,764.03** lbs/academic year with the potential to divert **40,153** lbs/year. *21,588.01 x* **3** (*Quigley, Hurst/Kelly and Taylor*) = 64,764.03 lbs a year; 64,764.03 x 0.62 = 40,153 lbs/year diversion potential.

Paul Wright Gym/ Fieldhouse:

The Paul Wright Gym and Fieldhouse share a dumpster with an average waste collection rate of 12.5 yd³ per week. The data from the waste audit on November 10th 2015 is extrapolated over the 32 week academic year to quantify the breakdown of material stream in pounds per year. Once sorted for stream composition the audit sample totaled 0.566 yd³ of the12.5 yd³ collected per week.



Figure 3 shows the audit results as percent of total audit sample for the Paul Wright Gym / Fieldhouse. Completed November 10th, 2015.

The results reveal that the Gym/Fieldhouse has a potential diversion rate of 63.73%. This number is calculated by subtracting the solid waste component (36.27%) from the total waste stream. The most frequent avoidable waste stream component is industrial compost (paper towels).

Daul Wright Cum	ud ³ (Comple)	0/ Comple		Lbs/	Lbs/
Paul Wright Gym	yu (Sample)	% Sample	yu / week	Week	Academic Year
Solid Waste	0.21	37.07%	4.63	417.03	13,345.10
Plastics	0.053	9.36%	1.17	42.10	1,347.22
Cardboard	0.074	13.06%	1.63	163.28	5,225.07
Industrial					
Compost	0.151	26.65%	3.33	299.87	9,595.76
Aluminum	0.012	2.12%	0.26	16.68	533.80
Tin	0.001	0.18%	0.02	3.31	105.91
Compost	0.008	1.41%	0.18	35.30	1,129.74
Paper	0.051	9.00%	1.13	544.66	17,429.13
Glass	0.005	0.88%	0.11	66.20	2,118.27
E-Waste	0.0015	0.26%	0.03	2.98	95.32
Total	<mark>0.5665</mark>	<mark>100.00%</mark>	<mark>12.50</mark>	<mark>1,591.42</mark>	<mark>50,925.33</mark>

Table 4 shows results from the Paul Wright Gym/Fieldhouse waste audit extrapolated over the 32 week academic year.

The results for average waste stream composition (%), yd^3 per week, pounds per week, and pounds per academic year are listed in Table 4. The Paul Wright Gym/Fieldhouse collects **50,925.33** lbs of waste per year with the potential to divert 31,573.69 lbs/year. *50,925.33 x 0.62 = 31,573.69 lbs/year diversion potential*

Whipp Maintenance Buildings/ University Center

The ENVS 620 group did not complete a waste audit for the University Center and Whipp Maintenance Buildings. To quantify the total waste collected each year for these buildings the Waste Management and Facilities Dept. audit from 2014 is cited in cubic yards per year. The 2014 audit reports that the University Center and Whipp buildings generate 144 yd³ and 192 yd³ of waste per year. The University center utilizes an on-site trash compactor to minimize waste volume; EPA cites a volume to weight conversion of 300lb per yd³ for compactors, while the standard bulk conversion number of 90lb per yd³ is cited for Whipp. Therefore the total weight in pounds of waste per building per year is as follows:

- University Center: 43,200 lbs/academic year
- Whipp Maintenance Building: 10,713.60 lbs/academic year

All other campus waste

To quantify the total amount of waste generated at Western over the course of one academic year the following numbers are cited from the 2014 Waste Management and Facilities Dept. audit.

- End of academic year roll-off collection : 45,000 lbs
- Recla Metals roll-off: 24,000 lbs
- E-Waste (Metech): 4000 lbs
- Total Campus recycling: 120,000 lbs







5.3 Food Audit

5.3.1 Methodology

In partnership with Sodexo food services, ENVS 620 audited the campus cafeteria, the Rare Air Café in three key streams: prep, spoilage, and plate.

- Spoilage –Food that has gone bad or is unusable in future food services, due to expiration or health code.
- Prep Any food waste from the kitchen preparation of food that day.
- Plate Any material going back to kitchen from diner's plates. This include paper napkins, wooden stirrers, and small plastic wrappers.

The goal of the food audit was to determine a baseline for both pre and post consumer food waste in campus food service as well as to benchmark the cost of food waste to Western. Additionally, Western currently utilizes a food "pulper" that the manufacturer claims decreases food waste volume x5. Facilities requested that we test the accuracy of the manufacturers claim. For the food waste audit the British Foodsave.org "DIY Food Waste Audit" methodology was applied (http://www.foodsave.org/resourcelibrary/diy-waste-audit/).



Audit #1

December 6th, 2015 Audit Lead : Cassidy Tawse-Garcia Audit Participants: Stephanie Aubert, Alyssa Vogan, Zach Vaughter, Tyler Grimes

Supplies Needed: Measuring Tape Recycling Bin Pen and Paper (3) large trash cans Trash bags Gloves Scale

Food Service Timing: 7:15 – 10 am \rightarrow Breakfast 11 – 1:30 pm \rightarrow Lunch



5.3.2 Analysis

First, some assumptions were made in the methodology. The audit was done over one day's breakfast and lunch, calculating weights of spoilage and prep, and weights and volumes of plate waste, while taking into account the number of meals served. We extrapolated these numbers to determine a weekly average of food waste, as well as cost of food waste to Western (using the FoodSave formula).

The results indicated that the food pulper is on average, 79.5% efficient by volume) turning 13,572 in³ into 3,267.08 in³ (combined breakfast and lunch). There is significant variance between breakfast and lunch though, as breakfast food volume efficiency is 88.8%, and lunch is 70.1%. It is thought that this discrepancy has something to do with the water content in the makeup of breakfast versus lunch food.

In terms of weight, the pulper is 62.34% efficient, turning 199.9 lbs into 91.6 lbs (combined breakfast and lunch). The only food pulped is plate waste, as prep and spoilage goes directly to a local pig farm. Again, with the pulper weight between lunch and breakfast, there was significant difference. Breakfast was 85.69% efficient and lunch was only 38.99% for an average of 62.34%.

These numbers do not appear to match the manufactures claims for waste reduction, by volume.

Hobart Pulper Efficiency	Weight- Pre Pulp (Ibs)	Weight - Post Pulp (Ibs)	Volume Pre-Pulp (in³)	Volume Post-Pulp (in³)	Pulper Efficiency (volume)	Pulper Efficiency (weight)
Food Waste (Breakfast)	65.0	9.3	4,212.0	468.0	88.89%	85.69%
Food Waste (Lunch)	134.9	82.3	9,360.0	2,799.08	70.10%	38.99%
Average					<mark>79.49%</mark>	<mark>62.34%</mark>

Table 5 is a breakdown of the University food pulper efficiency rates of plate waste, by volume and weight.

Table 6: Total weight and Cost of food wasted to Western over school year (32 weeks).

Average Covers Per	Annual Waste Weight:	Annual Waste	Annual Cost of
Week: <mark>5,370</mark>	<mark>78,572 lbs</mark>	Weight (Pulped):	Waste: <mark>\$59,297</mark>
		48,981 lbs	

Note: In calculating the baseline of the total waste for the University Center Building, we used the generic weight to volume conversion from EPA, that is 300 lbs, per cubic yard for waste

compactors. The next step would be to normalize methodologies between the Campus Waste Audit and this specific Food Waste audit, taking into the compactor, as well as benchmark methods.

Food Waste Totals by Weight	Spoilage	Prep Waste	Plate Waste	Total	Waste Cost (Per Cover)	Waste Cost (Total)
Breakfast	10.0 lbs	10.0 lbs	65.0 lbs	85.0 lbs	\$0.37	\$101.58
Lunch	43.8 lbs	43.8 lbs	134.9 lbs	222.5 lbs	\$0.67	\$265.80
Total	53.8 lbs	53.8 lbs	199.90 lbs	307.5 lbs	Avg (\$0.52)	\$367.38

Table 7 is a breakdown of food waste by category measured in weight (lbs) to determine cost incurred by Western.

5.3.3 Discussion

The Food Audit was the last audit to be completed. We would suggest next steps of normalizing these results with the total waste results from previous audits. Due to the use of a pulper and a compactor, estimating the amount of waste generated by the University Center, especially the foodservice operations, becomes complicated, and warrants further study.



5.4 Purchasing Audit

Purchasing refers to the necessary items and products required for the proper management of everyday campus activity. The Purchasing Audit focused most on administrative and custodial purchasing (such as office supplies, office paper and paper towels), as it was identified early in the Toolkit process as a priority for audience engagement.

5.4.1 Methodology

Purchasing is one of the most powerful tools to help attain Zero Waste, as it is the category that increases Aversion of waste to campus in the first place. Thoughtfully implemented, green purchasing practices allow schools to gain the marketing edge, branding themselves as sustainability leaders. Sustainable purchasing has the ability to save schools money through bulk purchasing and operational costs by increasing efficiency. Through **sustainable purchasing practices**, Western State Colorado University has the ability to **avert** landfill waste before it ever reaches campus, *and* ensure that **waste diversion** is considered and aligned with purchasing policies.



Arizona State University's (ASU) ambitious and successful Zero Waste campaign called for green policies to minimize packaging, align purchased single use items with recycling and composting initiatives, use sustainable design guidelines for construction, and purchase efficient electronic equipment. ASU's lofty goal of 25% waste aversion was only achievable through green purchasing strategies, where purchasing is the stop-gap measure to keep landfill materials from ending up on campus (Arizona State University Sustainability Practices).

The purpose of the Purchasing Audit was to gain as much information as possible about WESTERN STATE COLORADO UNIVERSITY's purchasing habits. WESTERN STATE COLORADO UNIVERSITY Procurement Specialist, Sue Oberly, revealed that there are over 80 people on campus with

purchasing power. Since neither time nor funding allowed for a comprehensive survey of all purchasers, informal interviews with eight different campus purchasers provided a sample of purchasing habits. These included specialists from the Budget and Procurement Office, two Administrative Assistants from the Athletics Department and the recreation and outdoor education program, the custodial manager, and coordinators from Admissions and Orientation offices. Distributors were also contacted to determine purchasing amounts of key waste items, such as paper towels, office supplies, orientation and campus visit materials.

5.4.2 Results

Many bottom up and top down approaches to green purchasing have already been implemented at WESTERN STATE COLORADO UNIVERSITY. In 2011, Western adopted its Socially and Environmentally Responsible Purchasing Plan (SERPP) (Brooke Moran, Personal Communication). The goal of the plan is to "reduce the unfavorable environmental and social impacts of WESTERN STATE COLORADO UNIVERSITY's purchasing by buying goods and services from manufacturers and vendors who share Western's commitment to the environment" The SERPP prescribes the purchasing of products that embody high content from post-consumer recycled materials; have low embodied energy; are recyclable, compostable and biodegradable, non-toxic, energy efficient, durable and/or repairable; produced in a manner that demonstrates environmental, social, and ethical values; have minimal packaging (packaging should also abide by the above principles); and have afterlife reuse/regeneration potential through the company.

Several interviewed staff members were aware of the purchasing plan and claim to abide by it, because it was adopted by the former University President, and because it is the "right thing to do." Other purchasers seemed unaware of the policy, and continue to shop for items based on price. However, compliance with SERPP, and in fact, campus purchases that fall under the \$5000 mark, are not monitored or tracked. Several bulk items, such as office paper and paper towels, are easy to track, but other items are subject to the whims of 80 individual purchasers. Tracking of office paper habits was made possible through bulk purchasing, and personal conversations with Nathan King, Campus Sustainability Coordinator, revealed that WESTERN STATE COLORADO UNIVERSITY had cut back on office paper, from 514 cases in 2011-2012 to 362 cases in 2014-2015, through Paperless Friday and double sided printing initiatives.

Table 8: Detailed breakdown of top purchased items in administration, custodial and admissions departments.

Office Paper	Cases per year	Cost per case	Total per school	
			year	
FSC Approved 100% Recycled	362	\$40.90	\$14,805.80	
2014-2015				
Trash Bags	Boxes	Price/box	Total per school	
			year	
Small Bags	22	\$12.48	\$274.56	
Medium Bags	114	\$17.63	\$2,010	
Large Bags	139	\$30	\$4,170	
Paper Towels	Cost per case	Cost per year	Cases/year	
Kimberly Clark bleached	\$26	\$9,100.00	350	
Genuine Joe Brown	\$28.13	\$9 <i>,</i> 845.50	350	
Orientation Items	Amount per	Cost	Unit cost	
	year			
Pens (From 4Imprint)	1000	\$305.80	\$0.31	
Move-it Bike Bottles, BPA free,	5000	\$5,784.00	\$1.16	
#2 plastic				
Admissions	Amount	Cost	Unit Cost	
Drawstring backpack	1000	\$2,690.00	2.69	
Sunglasses	2000	\$2,578.60	\$1.29	
Nestle- Single Use Water Bottle	25% of visitors	order 50-100	Petty Cash / No	
	take one	a time	tracking	
Other				
Dry-erase markers				
Pilot BeGreen Vboard 92%	\$8.79/set of 5	Refills (Refill 4	Price for 10	Price for 25
recycled content		times)	markers	markers
Price each	\$1.76	\$0.88/ea.	\$13.19	\$26.39
Expo Dry-Erase Markers, no	\$13.99/dozen	Refills (new	Price for 10	Price for 25
recycled content		marker)	markers	markers
Price each	\$1.17	\$1.17	\$11.70	\$29.25

5.4.3 Administrative Purchasing Recommendations

Regardless of implementation, it is of utmost importance that WESTERN STATE COLORADO UNIVERSITY's Zero Waste Toolkit honor what is already being done on WESTERN STATE COLORADO UNIVERSITY campus around green purchasing. Sustainable purchasing offers a critical opportunity for both staff and student engagement and education, and many staff members feel a sense of pride and ownership through use of the Socially and Environmentally Responsible Purchasing plan, and other initiatives, as well as in generally "doing the right thing." Within those staff, there are champions who will help put Western on the map as a leader among College Universities headed to Zero-Waste.

However, these champions are at capacity as far as their ability to implement further waste aversion or diversion strategies, and both monetary assistance and uptake of policy by campus administration will be needed to increase efforts. The following is a brief list of recommendations, there are many potential additions to this list. With the building of capacity and supporting of employee engagement through sustainable purchasing, WESTERN STATE COLORADO UNIVERSITY will be able to stay abreast of market advancements in green purchasing.

Adherence to SERPP – The survey provided by the Roadmap to Zero Waste Toolkit will allow a baseline assessment of compliance with Western's Socially and Environmentally Responsible Purchasing Plan. The informal interviews conducted for the purchasing audit revealed majority compliance among the sampled population, but certainly less than 100%. New purchasers can be oriented to the purchasing policy as an educational measure.

Streamlined Purchasing System – A streamlined, campus wide, business-to-business e-marketplace, such as <u>Tufts University's Marketplace system</u> (Finance Department, 2015), will save WESTERN STATE COLORADO UNIVERSITY money through bulk purchasing and increased operations efficiency. This top town approach limits the products available for purchase to sustainable options, and increases the bulk buying power of the University. The Paper Clip, a popular Gunnison based distributor, could provide a cheap and easy streamlined purchasing solution, if they were willing to limit options to the most sustainable choice and become the official primary supplier for WESTERN STATE COLORADO UNIVERSITY. This



practice would also allow purchasing to be monitored and baselines established.

Green Office Certification – WESTERN STATE COLORADO UNIVERSITY's Sustainability Action Committee (SAC) circulated a letter of support for the SERPP. Signing also indicated support for a committee to oversee implementation of the plan. One way to encourage implementation would be a Green Office Certification checklist. Individual offices could volunteer to be certified at various levels, winning awards for compliance with sustainable practices including purchasing. **Materials Substitution Options** – Through the Purchasing and Waste Audits, several opportunities arose to substitute materials that would allow greater diversion, such as compostable paper towels in the restrooms, and 1 and 2 plastics only for single use silverware in the cafeterias. Likewise, opportunities arose for waste aversion, such as giving orientation students the choice between a water bottle and a reusable to-go container from the cafeteria. Campus visitors could be given a choice between sunglasses and a reusable coffee cup. Each of these substitution events provides an opportunity to educate WESTERN STATE COLORADO UNIVERSITY students and the broader community about waste practices, as well as brand Western as a sustainability leader.

5.5 Campus Dining Services Purchasing Overview



To gain an understanding of Sodexo's purchasing of disposable items, Dining Services Director Jon Coady was interviewed. Ultimately, the goal was to identify if more sustainable alternatives to common disposable items existed. More than \$4,000 is spent on the following five disposable items each year:

- 5th Pepsi cups 24 oz. = 2,985* per school year
- 4th Coffee cups 16 oz. = 3,081* per school year
- 3^{rd} Paper trays $3\# = 10,985^*$ per school year
- 2^{nd} Paper trays $5\# = 21,973^*$ per school year
- 1st Paper tray inserts = 33,067* per school year
- *Estimate based on purchasing records from August 24, 2015 December 2, 2015, extrapolated for 32-week school year.

Unfortunately, none of the top purchased disposable items are recyclable, though the coffee cups contain some post-consumer materials. It is important to note that Sodexo is doing their share to minimized waste on campus. To learn more, and for dining-specific recommendations, refer to section on Existing Initiatives. The most efficient way to decrease waste is to choose reusable products over single-use options.

Item:	Cost per unit	Weekly Quantity	Yearly Quantity	Cost per academic year
Pepsi cups 24 oz.	\$0.08	93.27	2,984.53	\$238.76
Coffee cups 16 oz.	\$0.10	96.27	3,080.53	\$308.05
Paper trays 3#	\$0.04	343.27	10,984.53	\$439.38
Paper trays 5#	\$0.06	686.67	21,973.33	\$1,318.40
Paper tray liner	\$0.05	1,033.33	33,066.67	\$1,653.33
				\$3,957.93

Table 9: Shows the breakdown of the top five disposable, single-use food service items purchased by Sodexo for the 2015-2016 academic year.

5.6 Admissions Purchasing

The admissions department has big responsibility. They have group and individual campus visits to schedule, preview days to plan, and important first impressions to make. As a part of this, the Admissions department offers "freebies" for prospective students. Currently, these include pairs of sunglasses and Western backpacks.

Why do we care about Admissions? A student's first impression of Western is a great time to introduce them to the Zero Waste program. Second, Admissions purchasing is a good avenue to promote waste minimization outside of campus. We recommend evaluating the current giveaways by considering magnets, reusable shopping bags (as opposed to cheap backpacks), or **metal** water bottles instead.

6.0 Communications, Outreach and Engagement

Implementing zero waste at Western will require strategic communication of research findings by reaching out to stakeholders on campus, and engaging the campus around proposed initiatives. We suggest increasing (1) student, (2) faculty, and (3) staff engagement through audience-specific outreach and communication initiatives. Below, we have outlined a social media strategy for engaging the student body.

The initial objective of this plan is to engage local stakeholders to change our campus waste stream. These achievements can then be leveraged to improve Western's public image as a sustainable university, increasing recruitment of socially engaged students, and rankings in national listings.



6.1 Social Media Strategy

Below is an example of a social media strategy, which could be implemented during the first week of classes, for every school year could be adjusted to meet current student and staff engagement goals.

- **Objective**: Communicate new opportunities for reducing the waste stream at Western to students and staff via social media.
- **Strategy:** Early posts will introduce the campus to zero waste ideas → *The first step is ensuring understanding, prior to delving into engagement*
 - Utilize hashtags (#) to develop and track community engagement.
 - \circ $\;$ Use compelling statistics, images, and incentives to build support.
 - All posts by social media team are to be planned within social media outlets



reduce #GHG impacts by equivalent of a years worth of energy use at the Savage Library



hashtags for all posts:

#westernup #zerowaste #stopthinksort #ZeroWastedState

Examples of Social Media Campaign Posts:

 Day #1: Announce the start of the Western Zero Waste Initiative via Instagram, Facebook, and Twitter.
 Facebook: post image "Compost Sign" and text: "We can go from only recycling 24.16% of our waste to diverting 71.18% just by maximizing current recycling and compost efforts."

"This would eliminate 298,000 lbs of

recyclables and compostables per year from entering the landfill."

• **Day #2:** Share data and begin photo contest.

Facebook: post image "Cost and

Weight Visual" to introduce cost and weight statistics. Instagram: post image "Cost and

Weight Visual" and request for student pictures with hashtags listed above: "Post photos of fellow students composting or recycling and tag with *#westernup #zerowaste #stopthinksort* to enter a contest for campus gift card."

• Twitter / Facebook: direct students to Zero Waste Photo Content on Instagram for a chance to win a campus gift card:

- Twitter length post, "post photos of students composting, recycling, tag with *#westernup #zerowaste #stopthinksort* to enter contest for campus gift card."
- Facebook, "Head over to Instagram and post photos of fellow students composting or recycling and tag with *#westernup #zerowaste #stopthinksort #zerowastedstate* to enter the Zero Waste Photo contest for a campus gift card."

• Day #3:

- $\circ \quad \mbox{Twitter: retweet Twitter submissions}$
- Instagram: repost 1 submission with zero waste hashtags
- All community posts that are tagged with the zero waste hashtags will be tracked and measured by social engagement frequency
- **Day #4:** Highlight Western's Terracycle program and continue photo contest that will end on day five.
 - Facebook Post image "Terracycle" and text: "Terracyle is an innovative company that provides services for hard to recycle items like 'Solo Cups' made of #6 plastic. Western started recycling these cups in 2015. Pitch in today!"
 - "Tomorrow is the final day for the Zero Waste Photo contest. Post pictures of proper sorting and tag to win! Drawing happens next week."
 - Instagram / Twitter: Post image "Terracycle" and text: "Tomorrow is final day for zero waste photo contest, post now! winner selected next week"

• Week Two: Winner is selected by most liked post, or most creative, and announced on all platforms. Continue engaged posting of zero waste facts

- **Day #1:** Facebook: announce photo contest winner
 - Twitter: announce photo contest winner and provide link to Facebook page.
 - Instagram: repost photo contest winner
- **Day #2:** Instagram / Twitter: repost or retweet other compelling community entries that were tagged.
- **Day #3:** Facebook / Instagram: Ask winner to post photo using their gift card, and a reusable container, at campus retail location.
- **Day #5:** Announce "Instagram Takeover" for following week that will feature posts by Sustainability Coordinators
- Week Three: Utilize Sustainability Coordinators to collect images of waste activities around campus, in real time:
 - Photographs of Earth Tub, campus dining locations, building waste collection points etc.
 - Make 3 photographic posts to each platform during this week.
 - End of Week: Facebook— Announce release of the campus waste survey the following week.
 - **Week Four:** This week will begin long-range version of the social media strategy that will continue for the remaining weeks of the semester. Typical weeks of the campaign should include:

- One Facebook photo post with text containing facts or statistics drawn from the Zero Waste toolkit, special events, or other information.
- One Instagram photo post of waste reduction or collection on campus.
- One Twitter post of text containing stats and statistics drawn from the Zero Waste toolkit, special events, or other information.
- Special events including athletic events, Recyclemania, Clean Your Plate Club, Choose To Reuse, and the student move out period at the end of the semester will be highlighted by the social media team.
 - These are examples of campus events that will be announced and covered during the semester during weekly posts. The details of these types of program are included in section 4.2 of this document.
- Athletic events will be supported by posting photos from games that depict proper disposal of waste. The Zero Waste team has identified these events as opportunities where diversion rates can be easily increased with social media and on the ground support.
- **Long-Term:** The move out period at the end of the semester has also been identified as a time when social media can identify trash, recycling, and Terracycle locations to increase the diversion rates for these materials. Photographs and locations of these diversion points will collected by the social media team and posted during the weekly posts leading up to this time period.

6.2 Current Campus Initiatives Around Waste Minimization

As a campus, Western has done an admirable job implementing waste minimization programs in the past. The following describes existing measures and provides recommendations for improvement and expansion of these programs, as well as ideas for leveraging existing initiatives to move closer to Zero Waste goals.

6.2.1 TerraCycle

<u>Summary</u>

Founded in 2001 by a Princeton University freshman, TerraCycle now collaborates with over 100 brands to literally transform trash to treasure while keeping it out of the landfill. At any point in time, the company features anywhere from 30-40 different waste collection programs - from a cigarette waste brigade, to an e-waste brigade, to a shoe donation program.



http://www.terracycle.com/en-US/brigades/cigarette-waste-brigade.html

Each "TerraCycleable" item is redeemable for points, and in most cases, each point it worth \$.01, though guidelines vary from program to program. Shipping acceptable items to TerraCycle is

always free. Institutions set out bins for each program they chose to participate in, and gain rewards for doing so. TerraCycle remanufactures the "waste" products into a diversity of sturdy products such as fencing made from upcycled drink pouches, circuit board clipboards, and innovative baby toys. For each program, TerraCycle provides useful campaign tools such as poster templates, DIY Collection Bin Kits, printable thermometer goal posters, and "Collect, Store, and Ship" guides. In addition to the cash



rewards offered for each program, TerraCycle sponsors periodic competitions for specific programs. Furthermore, each one of TerraCycle's final products can be TerraCycled infinitely!

TerraCycle and Western

Western already participates in TerraCycle programming in some capacity.



In the Fall of 2015, the Western Sustainability Coordinators enrolled Western in the Solo© Cup Brigade. Solo© cups are composed of #6 plastic, which is very rarely accepted through standard recycling streams. For each piece of accepted #6 plastic, TerraCycle donates \$.02 to Western. Because the Solo© Cup Brigade is currently offering bonus incentives, TerraCycle will donate an additional \$2 for 5 lbs. of acceptable items, \$5 for 15 lbs., and \$10 for shipments over 30 lbs. An additional benefit is that shipping is free and labels can be printed directly from Western's TerraCycle account. In addition, Western signed up for the Writing Instruments Brigade prior to TerraCycle

capping registration for this specific program. Each writing instrument is worth \$.02, and collection bins take up little space. Bins should be placed near the Zero Waste displays in all campus buildings, though currently a single collection bin for this program is located in Crawford Hall on campus. The waste audits performed as a portion of the research for this project revealed a substantial volume of used dry erase markers, pens, and permanent markers. These could have been kept from the
landfill and turned into cash for Western. Updated information about the TerraCycle Writing Instruments Brigade, including campaign tools, can be found here: www.terracycle.com/en-US/brigades/writing-instruments-brigade-r.html

Opportunities for Expansion

Though some TerraCycle programs are not relevant to all of campus, there are several

opportunities to expand TerraCycle programing at Western to further our momentum to Zero Waste while turning a profit that can be added to the existing Sustainability Fund, to offset the payroll for the Sustainability Coordinators, or to be used as prizes for other Zero Waste initiatives. This toolkit recommends the following additions:

<u>TerraCycle Personal Care and Beauty Brigade</u> Like the Solo© Cup Brigade, each Personal Care and Beauty Brigade item earns \$.02 for Western. While it would not make sense to make receptacles for this program available in academic or administrative buildings, it would be worthwhile to make them accessible to residential students. Options include



featuring a receptacle in the Zero Waste display in each residential building, or near the restrooms on each floor. An annual competition might be held between each residential floor on campus to raise awareness about the campaign. Our recommendation based on ease of program implementation would be to feature one receptacle with information about the program in the Zero Waste display of each residential building. The items could be collected and sent out once a semester, or once annually. This could be facilitated by the residential director of each building in collaboration with the Sustainability Coordinators and/or student volunteers. Program details available at: www.terracycle.com/en-US/brigades/personal-care-and-beautybrigade-r.html

TerraCycle E-Waste Brigade

The research conducted to create this toolkit revealed that proper disposal of E-Waste is a problem. Not only will participation in TerraCycle's E-Waste Brigade keep dangerous electronic waste out of the landfill, it will earn Western some money. See the box below for specifics regarding acceptable items and their corresponding point value. This toolkit recommends either the placement of a TerraCycle E-Waste receptacle and information regarding accepted items in all campus buildings, or information about the program and the locations of strategically-placed receptacles in each building. E-waste items be sent to TerraCycle at least on an annual basis. Updated information about the TerraCycle E-Waste brigade found here: www.terracycle.com/en-US/brigades/e-wastebrigade.html

TerraCycle E-Waste Brigade Accepted Items

For each approved item or *working* device received, your collection location will be awarded the following TerraCycle points:

- Select phones up to 7,500 points
- Devices with an Intel i7 processor 2,500 points
- Devices with an Intel i5 processor 1,000 points
- Devices with an Intel i3 processor 750 points
- Devices with a quad-core processor 600 points
- Devices with a dual-core processor 400 points
- Devices with a single-core processor 125 points
- iPad devices 250 points
- Other tablets 50 points
- Touchscreen iPods 150 points
- All other iPods 50 points
- Select toner cartridges 50 points
- Inkjet cartridges (from HP and Canon printers only) 25 points
- All cameras and camcorders (5 MegaPixel and higher) 25 points
- Graphing calculators 25 points
- **Non-working phones 25 points**. A non-working phone has a broken or bleeding screen, water damage, or does not power up.
- **Non-working laptops and tablets** 50 points. A non-working laptop, tablet, or e-reader does not power up and/or may have physical damage like a cracked or bleeding screen.

With zero risk and zero cost, it would be very easy to expand TerraCycle programming on the Western +campus to move closer to Zero Waste. To institutionalize programming, consider involving Western's Center for Environment and Sustainability, the campus Sustainability Coordinators, the Sustainability Coalition, the Leadership, Engagement, and Development (LEAD) office, Residential Life, student volunteers, and building administrators.

> Updated information about current TerraCycle programs can be found here: <u>www.terracycle.com/en-US/brigades.html</u>

6.2.2 FreeCycle

Summary

A key component of a zero waste strategy is the repurposing of good, to increase usage time, prior to reaching waste stream. FreeCycle is a free resource for Western students, faculty, and staff alike. Located in the basement of Ute Hall, it is a place to find everything from clothing, to kitchen utensils, to working electronics, and much more. FreeCycle constantly receives donations, so you will never know what you may find on



any given day. Drop off locations for FreeCycle donations can be found in most residential buildings and in front of the FreeCycle entrance in the basement of Ute Hall.



An additional benefit to the FreeCycle program is the end-ofsemester collection services. Students living on campus are often in a hurry to dispose of furniture, unwanted textbooks, and much more at each semester's end.

In the past, the Sustainability Coordinators have organized efforts to aid in the process of emptying dorms by collected unwanted goods and bringing them to FreeCycle for others to benefit from in the future. Not only does this greatly assist students eager to return home, but it keeps a lot of unwanted but useful items out of the landfill.

Other colleges and universities take advantage of unused space on their campuses to store unwanted items for extended use.

Warren Wilson College has operated a "Free Store" on their campus since 1999. The Free Store is organized by "department" and includes books, non-perishable food items, furniture, home goods, clothing, and much more. Student employees keep the space organized, and daily operation allows all students to stop in at their convenience. See the box below for recommendations to improve FreeCycle's success at Western.



Explore

WWC Home Page Recycling at WWC History Items We Recycle 2013-2014 Stats & Weight Dat Recycling Crew Members Cob Shed Free Store Cool Stuff We Do! Surplus Furniture Links Contact Info

Warren Wilson College Free Store

Since its inception in 1999, the Warren Wilson Free Store has grown from one rusty shelf of items to an ever-expanding sea of treasures! Thanks to the overwhelming support of the Warren Wilson Community, the FreeStore has been a huge success. In FY 2008-2009 alone, over 19,000 items were taken from the FreeStore!

FAQ's



Making a mess isn't even fun

What is the Free Store?

Check out this video explanation that we made for freshmen!

Freecycle Recommendations

While Freecycle is an incredible resource for the campus community, there are a few simple things that will contribute to an increase in use:

<u>Open Hours:</u> Although open hours fluctuate each semester, they are never posted. Correct hours should always be posted by the entrance of Freecycle.

Social Media: A Western Freecycle Facebook page should be updated with open hours and periodic photos of available items.

<u>Webpage:</u> Create a webpage through the Western site specifically for Freecycle, such as that created for Warren Wilson College's (WWC) "Free Store".

<u>Volunteers:</u> Currently, the Sustainability Coordinator operate Freecycle but it is often a struggle for the group to find individuals to volunteer during open hours. Expansion of outreach would be helpful for finding eager volunteers.

<u>Donation Bins:</u> The placement of donation bins is very important. They should be located at the Zero Waste display in each residential building.

<u>Information:</u> Adequate information including accepted items, location of Freecycle, open hours, and volunteer information should be clear and located near/on donation

End of Semester Collection: A marketing blast should be made at the end of each semester, particularly spring semester, so that all students know it's happening and where to deposit their unwanted items. Furthermore, a concerted effort should be spent on finding additional volunteers during this time. Volunteers might be placed in a raffle for a prize and/or receive a Zero Waste t-shirt. Consider asking Sodexo for free meal donations as well. <u>Coordinate with Terracycle:</u> Freecycle would be a great workspace to collect, sort, and sort Terracycle items. Freecycle volunteers can aid in collection.



Freecycle is located in the basement of Ute Hall

6.2.3 Recyclemania

Summary

bins.

Recyclemania is a recycling competition between colleges and universities in the United States and Canada. What began as a friendly competition between two campuses in 2001 has evolved into a contest between over 400 campuses. Each participating school chooses which of nine categories to participate in for eight weeks in the spring. In 2014, Western was 37th for the bottles and cans category with 1.99 lbs./capita.



Recommendations

The facilities department, namely Nathan King, has be integral in spearheading the Recyclemania

initiatives at Western each year. However, there is much room for expansion of the program if Facilities receives support and assistance from students and other campus departments. For example, the residential directors of each dormitory can work to promote the competition in each of their respective buildings. Furthermore, Residential Life might sponsor a competition at the same time to encourage competition between the buildings or between each of the floors on each building. With respect for differing numbers of residents on each floor, per capita recycling could still be measured. If Residential Life partnered with Sodexo. the student winner would receive a prize. Winning schools get national recognition and valuable bragging rights. To assist in outreach and engagement, Recyclemania's

Recyclemania Categories:

- 1. Grand Champion: Measures total waste and total recycled, including diverted food waste.
- 2. Per Capita Classic: Weight of recyclables as a ratio of campus population.
- **3. Waste Minimization:** The lowest per capita waste generated takes the cake here.
- 4. Gorilla Prize: Refers to school with the highest gross tonnage of recyclables.
- 5. Targeted Materials: Measures per capita collection of specific materials: cardboard, can, bottles, paper, or food waste.
- 6. "E-Cyclemania": Pre capita e-waste recycling over a 10-week period. Can include the general public.
- 7. Film Plastics: Special program to encourage college participation in recovery programs. Includes plastic bags, bubble wrap, and stretch wrap.
- 8. Game Day- Basketball: Special program to measure landfill diversion during a basketball game. Encourages event-based Zero Waste initiatives.

website offers many free printable resources and promotional materials. See the appendix for examples.

6.2.4 Choose to Reuse

<u>Summary</u>

Choose to Reuse is a Sodexo-sponsored program surrounding the use of reusable beverage mugs and meal takeout containers. Corporate Sodexo offers this voluntary program to its campus service branches and allows a bit of flexibility in order to cater the program to specific campuses. Essentially, campus dining services may choose to purchase the mugs and containers at wholesale, decide to sell the reusable containers as a kit or separately, choose to sell items at cost or for profit, and may opt in or out of providing incentives for students who use the containers on campus.

Western Campus Dining Director, Jon Coady, graciously cooperated with a student in 2014 on implementing the Choose to Reuse program here. The student received funds to purchase



the containers and Coady agreed to purchase some for Sodexo in turn. He also agreed that students would no longer be allowed to take out food from the Rare Air Café without using a reusable container. Furthermore, Sodexo offered, and continues to offer, a coffee discount when a reusable mug was used for Seattle's Best coffee.

Challenges



Though Western's division of Sodexo is very willing to work towards minimizing waste from disposable food items, many challenges relating disposable food service items (e.g. 'to go containers') exist. Sodexo has introduced a 'Choose to Reuse' program ,which features reusable to-go containers. However, challenges exist in increasing student usage rates of these reusable containers. Storage of the reusable items for sale is an important consideration. Additionally, once the reuseables are in the hands of students, health regulations become a concern. Sodexo has been trading students' meal containers with their properly sanitized counterparts in order to abide by the code. This works in the Rare Air Café,

but this is very difficult – if not impossible – in Western's Sodexo retail restaurant, Mad Jack's and Waldo's Cheesie Grill. The kitchen at Mad Jack's does not have to counter space to allow for several open clam-shell meal takeout containers. In addition, because Mad Jack's was designed for "to go" meals, no space for cleaning and sanitizer reusable options exist at the location. However, Coady has agreed that if options for reusable take out containers of similar size to the paper "boats" currently used, he would try expanding the Choose to Reuse or a similar program to Mad Jacks. If we want to see widespread utilization of the Choose to Reuse program on campus, the reusable kit should be available to all students. One issue with increasing the use of the reusable take out containers in the Rare Air Café is the occurrence of student "double dipping". This occurs when a student eats a meal in the Café before loading up their to-go container to take back to their dorm with them. Because the cost of a meal plan covers the cost of one meal per meal period, Sodexo has a lot to lose if the occurrence of double dipping increases. Finally, the proper promotion of the Choose to Reuse program continues to pose a challenge.

Choose to Reuse Recommendations

- 1. Institutionalize Choose to Reuse by using the Sustainability Fund to pay for a reusable kit for each student.
- 2. Research smaller reusable take out containers to substitute paper boats at Mad Jack's and Waldo's Cheesie Grill.
- Offer "deep discounts" on coffee when a reusable mug is used for the first month of each school year to incentivize behavior change. Use Sustainability Fund to offset Sodexo's coffee costs or establish partnership between Sodexo and other department(s) to share costs.
- **4.** Expand outreach campaign within the University Center and in residential buildings.
- 5. Create system to prevent students from "double dipping" in the Rare Air Café.



6.2.5 Composting at Western

Summary

The Western campus has three existing student compost initiatives: a) The compost endeavor in the Rare Air Cafe; b) The student residence hall compost initiative; and c) On-site composting in Chipeta Garden maintained by the student-led Organics Guild. Each of these is described below.



Composting in the Rare Air Cafe



A partnership

between Sodexo dining services and the Leadership, Engagement and Development (LEAD) office at Western had made composting in the main campus dining hall a reality. A compost station, featuring a compost bin and educational materials, is located adjacent to the dirty dish deposit bay. The compost bin is monitored by students during approximately 10 meal periods per week to prevent contamination of noncompostable materials, and to provide a resource for fielding questions about best composting practices. Participation varies greatly due to foods available during each meal period. Breakfast generally generates more compost-ready foods such

as raw fruits, peels, pits, and rinds. Because starches, oils and other fats, dairy, and meat are not ideal for the compost pile, few lunch items, aside from salads, are good for the compost. The brown

paper napkins available in the Rare Air Cafe are a safe addition, but it is important to maintain the

correct ratio of "green" waste (nitrogen, such as food waste) to "brown" waste (carbon, such as dead leaves or unbleached napkins and paper towels) to allow for efficient decomposition, and to prevent offensive odors and insect pests. The compost collected from the dining hall is dumped into the Earth Tub when full, or end the end of each lunch period Monday - Friday (unless the compost station was not monitored that day). For more information about the Earth Tub, see the box below or the appendix of this toolkit.





In November of 2015, following concerns with the success of the compost initiative in the Rare Air Cafe, the student compost crew, the LEAD office, and Sodexo agreed to make improvements to day-to-day operations. Changes included decreasing the volume of the compost receptacle from a repurposed trash receptacle to a 5-gallon bucket, a commitment to empty the bucket more frequently than in the past, and a trial of a new incentive-

based program. The incentive-based program enters frequent student composters into a weekly raffle for \$10 redeemable at the campus take-out restaurant, Mad Jacks and Waldo's Cheesie Grill. Program creators plan to offer a "substantial" grand prize at the conclusion of each semester to one composting champion in hopes to further increase rate of participation.



As one can imagine, the food waste generated in the dining hall was once a great burden to the total waste load of its host building, the University Center. To aid in decreasing the sheer volume of waste generated on campus, Sodexo purchased a food pulper to shred food waste, napkins, and wooden coffee stirrers into small pieces, ultimately decreasing the volume of food waste leaving the Rare Air Cafe by what Sodexo Director John Coady estimates to be 80-90%. While not being composted, an estimated 120-130 gallons of kitchen preparation waste is diverted from the landfill and fed to Gunnison pigs each week. According to staff, a Sodexo employee picks up approximately 24-27 five-gallon buckets full of kitchen prep waste and takes it home to feed her pigs, one of which is 780 pounds! This contributes to **about 4,000 gallons of food waste being diverted each school year**!

Composting in Student Residence Halls

In the Spring of 2015, the Sustainability Coordinators distributed 75 one-gallon buckets to students residing in either the Pinnacles or Chipeta Residence Halls, who were interested in composting their own food scraps. These dormitories were chosen due to their apartment-like format: each unit contains its own kitchen. The assumption was that students with their own kitchen would be more likely to compost than those in residence halls with a single, central community kitchen. Each bucket was complete with a lid and a colorful label listing compostable food items along with those to keep out of the compost. Participating students were instructed to drop their compost into a receptacle located among a dumpster and recycling bins west of the Pinnacles residence hall.

It is estimated that the 45-gallon compost receptacle, a 45 gallon waste receptacle allocated for this purpose, is currently emptied into the Earth Tub two times each semester by students.





From table to garden. OUT tea Ask Assistant if unsured

The Earth Tub

In April of 2010, Western purchased an Earth Tub following extensive research by a handful of students for just over \$10,000. The tub, manufactured by Green Mountain Technologies out of Washington State, is a composting vessel with a three yard capacity. Features include power mixing, aeration, and biofiltration. The Earth Tub was designed with institutional use in mind; it has the ability to handle daily loads of up to 100 lbs. In order to be effective during



the cold Gunnison winters, the tub is equipped with a heating element at its base, and students place a shop light in the tub to maintain sufficient temperatures during the coldest of nights. Unfortunately, since its installation in the Spring of 2010, the Earth tub had only been filled to capacity one time. Additionally, the manufacturers report that a minimum of 25 lbs should be incorporated into the Earth Tub each day, and this is rarely the case at Western. As of November 2015, the vessel is being used at about 15-20% capacity (E. Griffin, personal communication, October 22, 2015).

Composting at Chipeta Garden

The Western Organics Guild (OG) maintains a year-round compost operation in Chipeta Garden (located in the Chipeta Hall Courtyard at the intersection of Georgia Ave and Colorado Ave). While the compost bin is open to the campus community, members and friends of the OG mainly utilize it. Much of the material comes directly from the garden itself; weeds, dead debris, and rotten produce, but food scraps are frequently added to the pile as well. One benefit to this is that spoiled food provides nutrients to the soil that in turn, aid in the production of food in the gardens.



Composting Recommendations:

1.) Print and distribute labels, complete with lists of compostable/non-compostable items to interested students to stick on their own compost buckets **OR** give away magnets with this information as a part of the Zero Waste educational materials during new student orientation.

2.) More than one location to deposit compost should be available to residential students. These could include the existing Earth Tub and Chipeta Garden locations.

3.) Post maps with compost locations in all residential hall kitchens and as a part of the "Zero Waste" display in each building.

4.) Large receptacles should be emptied more frequently, or several, smaller-capacity bins should be available and emptied on at least a weekly basis by the compost crew.

5.) Distribute Compost Crew uniforms to volunteers and paid "supervisors" (Sustainability Coordinators, residential directors, or MEM sustainability mentors can act as supervisors to utilize existing resources).

6.) Create a cohesive system between the Rare Air Café dining hall initiative and the Chipeta Garden compost operations.

7.) Add unbleached paper towels to Earth Tub as a source of carbon to speed up the compost process and to decrease volume of paper towels sent to the landfill.

6.3 Other University Campuses' Best Practices and Initiatives

6.3.1 Arizona State Roadmap

- Audiences
 - Primary: Current students, New students (orientation), Current staff, New Staff (orientation), Faculty, Administrators, Sustainability organizations, Fans attending sporting events.
 - Secondary: 3rd party vendors/partners, events patrons/ campus visitors, Media outlets, Peer Universities.
 - Ambassadors
- Ambassadors
 - Power point for educating departments at department meetings
- Website
 - Zero Waste "Landing Page"
 - Community Interface for project info and tracking
- Zero Waste Factbook



- Describing policies, procedures and practices; specific actions for aversion, recycling, organics and re-use
- Lists of all recyclable materials and process for recycling
- Institutional memory necessary for creating marketing materials 4.7.2 Appalachian State Waste Reduction Strategic Plan
- Clamshell takeout containers, exchanged every use
 - Free for students enrolled in meal plans
 - Partnership between Dining Services, the Sustainability Office, and the Office of Waste Reduction
- "One less cup" encourages reusable mugs or cups
- "Green teams" from different departments to make assessments and conduct actions
- Green events, green event training, and green event certs.
 - 4.3.3 University of Oregon ZeroWaste Toolkit
- Information on recycling and Zero Waste practices included in all orientation programs for new employees, students and contractors
- Maintain accurate communications contacts list
 - Develop department contacts to serve the Zero Waste program in communication and education of procedures
- Use social media and staff meetings to communicate the importance of procedures, instructions, and resources
- Regular campus wide education/ outreach through competitions, webpage, social media, events and workshops
- Assist visitors on procedures
- Provide building users on what to do with non-routinely collected materials

6.3.2 University of Montana Recommendations for Improving Internal Communication

- Promote leadership development
 - Help employees see the big picture
 - Develop interpersonal skills, relationships and a professional network
 - Encourage employees to take initiatives and solve problems
- Promote communities of practice
 - Cross-functional communities of practice from different departments
 - Utilizing official channels of communication
 - Where is the idea thriving?
 - Marketing collaborative
- Improve employee on-boarding
 - On-boarding: leading to adoption of attitudes and behaviors
 - Milestones of progress
 - Support for managers
 - New faculty orientation



- Promote the practice of permission-based communication
 - The recipient and not the sender is at the center
 - Delivering anticipated, personal and relevant messages



Figure 4: Proposed communication tool for internal campus community engagement – "Push and Pull Strategies"

6.4 Engagement Around New Staff and Students

Summary

The beginning of each semester, particularly fall semester, is an ideal time to engage the campus on Western's Zero Waste Goals. Initially, engagement tactics focused only on students. Through our research and the waste audit, we realized not only that this campus operates by much more than students, but also that there are ways to engage the diversity of audiences that make Western thrive.

Audience-Specific Engagement

The interests and responsibilities of not only students but the various departments at Western are very different. That is why a multi-faceted approach to engaging all members of the campus community is crucial. We have thought about the diversity of needs and interests that make Western unique. Below, find a summary of recommendations for engaging a variety of entities contributing to Western culture.

Facilities Staff

Facilities services at Western have a multitude of responsibilities. They keep the campus beautiful, they regulate the vehicle fleet that moves students all over the country, they manage the waste stream, and much more. For the purpose of moving towards Zero Waste at Western, the custodial staff is where we have concentrated our efforts. They, too, have much responsibility. Each building has a system for sorting waste, and some buildings have a large number of small wastebaskets for specific wings or offices. When we preformed the waste audit, we found bags containing purely recyclables inside of bags with landfill waste. From this finding, we concluded that a Zero Waste training should be held for custodial staff at least one time per year. This brief training would refresh the importance and process of sorting waste for both seasoned and existing members of the custodial staff. Lastly, we encourage facilities to either replace paper towel dispensers for electric hand driers where possible, or to completely switch to compostable, unbleached paper towels as an alternative to a bleached version.

Administrative Staff

The academic departments at Western could not function without the hard work of the administrative staff. We have identified a few measures the administrative staff should take to allow Western to reach Zero Waste status. Mainly, our research has revealed that no streamlined process exists for administrative purchasing at Western. Streamlined purchasing would allow for all departments to order popular supplies less frequently, it would reduce shipping costs and transportation needs, and would greatly reduce packaging. Bulk purchases should be made at the start of each semester based on records of supply usage.

<u>Faculty</u>

The primary recommendation we have for engaging faculty in reaching Zero Waste goals is to substantially reduce the number of small wastebaskets in each academic and administrative building. For instance, in Kelley, approximately one dozen individual waste bins are scattered throughout the halls of the second floor of this academic building. This is not counting for any wastebaskets in instructor offices. Reducing the number of small waste baskets would reduce the cost of purchasing small trash bags destined for the landfill, encourage people to walk a bit further to find a receptacle to property sort their trash, and reduce the time it takes for the custodial staff to empty each bin, as waste would naturally be consolidated to fewer receptacles.

Students

Students should be educated and engaged in the Zero Waste initiative soon after they first set foot on campus for the semester. Understanding the importance of this program at the beginning of the semester is important for setting the pace for the rest. Existing Zero Waste initiatives are outlined in this toolkit, and it is important that students are aware of the existence of these initiatives to allow for their participation. For example, students should be introduced to the existing Zero Waste initiatives spearheaded by Sodexo. Not only so they can contribute to Zero Waste at Western, but there Sodexo offers incentives for supporting this goal, as in the "Clean you Plate" competition where students finish their meals or choose to compost their remaining food scraps to be entered into a prize drawing. There are ample ways students can be directly engaged in reducing the volume of Western's waste sent to the landfill. In order to institutionalize these efforts, we have concluded that new student orientation is among the best ways to engage students in the Zero Waste efforts as soon as they first set foot on campus as freshmen. Recommendations on how to incorporate Zero Waste programming in orientation are listed below.

New Student Orientation:

- 1. Waste education. A brief program, hosted as a collaboration between multiple entities, should be included for all new students. Collaborators might include, but are not limited to, Orientation, Residential Life, the LEAD office, Facilities, and the Center for Environment and Sustainability.
- 2. A Zero Waste tour. Either mandatory or voluntary, the tour should highlight existing Zero Waste initiatives for students. These include FreeCycle, Facilities' recycle and sorting center, TerraCycle, composting initiatives at Chipeta Garden and the University Center, and an orientation to the Recyclemania competition that occurs each spring.
- 3. Reusable containers. Orientation does a terrific job handing out worthwhile gifts to new students, such as student-designed t-shirts for new students that are unique to each incoming class, and reusable water bottles. Orientation should keep up the great work and serve as an example for their thoughtfulness. In addition, Sodexo's "Choose to Reuse" reusable meal and beverage take out kit should be given to new students, along with instructions for use. More information about this program can be found in the existing initiative section of this toolkit, but collaboration between Sodexo and other departments to cover the initial wholesale costs of these kits should be considered.
- 4. Lastly, there are several Zero Waste-related games that can be facilitated with new students. In addition to the Zero Waste education and engagement benefits, these games have value in team-building and ice-breaking between new friends. An example, as implemented by the University of Wisconsin and other colleges and universities, is outlined below.

6.4.1 Potential Engagement Strategies

"Cool Choices" Competition

To engage new students in Zero-Waste we recommend hosting a "Cool Choices" competition between residential buildings over the first month of the semester. Every building will have a poster "scorecard" tracking the amount of waste, recycling, and compost. Waste will be divided by number of residents to make the competition fair. Whichever building has the least total waste, and least landfill waste will win a prize (such as a pizza party). Residential Life and Campus Sustainability Coordinators will be important collaborators to help promote the competition, weigh waste each week and incentive participation. We recommend promoting the competition through social media, campus media outlets, newsletters and the website. An example of "Cool Choices" at the University of Wisconsin can be found here:

http://eeinwisconsin.org/core/item/page.aspx?s=113719.0.0.2209

Harvard's Garbage Games

This is an example of student engagement through competition that could be facilitated outside the University Center or outside of a sporting event on campus. Students are divided into two teams and each player wears flags (similar to flag football). Each team has three bins- trash, recycling, and compost. A pile of waste (fake or real) is placed in the center of the playing area, and the teams race to bring the most trash into their respective bins. When opposing team members pull a flag the players must drop the trash their holding and return to their "base" (where bins are located), and reposition their flags. If any waste is mis-sorted that waste goes to the opposing team. Whichever team has the most waste sorted properly after all waste from the middle is sorted, wins. The Garbage Games held at Harvard: <u>http://green.harvard.edu/tools-resources/how/garbage-games</u>

6.5 Systems Diagram



Figure 5: This diagram illustrates the current Western waste stream process and engaged stakeholders. It is meant to aid in understanding of available pathways in moving forward on zero waste initiatives.

7.0 Tool Kit Recommendations to Reach Zero Waste at Western

7.1 WESTERN STATE COLORADO UNIVERSITY Behavior Assessment and Waste Assessment Survey

In an effort to effectively determine waste and sustainability trends amongst the WESTERN STATE COLORADO UNIVERSITY student body and campus stakeholders, members of Dr. Brooke Moran's 620: Environmental Leadership and Sustainability Consulting course have developed the Western State Colorado University Waste Assessment Survey. Behavioral assessment involves observing or otherwise measuring a person's actual behavior—in other words, what they actually do—in one or more settings where the person is experiencing some sort of behavioral difficulty. Once the behavior is defined and measured, careful consideration is given to different factors that may be reinforcing and maintaining the behavior. It is necessary to collect diligent baseline data to further exemplify and identify cultural behavior amongst identified stakeholders on WESTERN STATE COLORADO UNIVERSITY campus. The purpose of this survey is to adequately collect baseline data to be utilized in implementing future WESTERN STATE COLORADO UNIVERSITY Zero-Waste projects and programming in the coming years, and should be undertaken by future members of a WESTERN STATE COLORADO UNIVERSITY Zero-Waste Implementation Team. This survey can be amended where necessary.

Note: In accordance with Western State Colorado University's, Human Research Committee and federal policy pertaining to the protection of human subjects (45 CRF part 46, as amended), it may be necessary to submit the following WESTERN STATE COLORADO UNIVERSITY Waste Assessment Survey for approval to the Human Research Committee prior to collecting behavioral and waste data. Further detail and contact information can be found

here: <u>http://www.western.edu/academics/academic-affairs/institutional-research/human-research-committee</u>

7.2 Campus Engagement within First Month of School

It has been concluded that the difference between Western's current diversion rate (24%) and potential diversion rate (71%) is engagement of both students and staff. That being said, the best time to influence campus-wide knowledge of waste, waste systems, and waste streams is at the beginning of the school year. From a social perspective, from August to October, new students and staff are becoming comfortable in their new academic home and setting habits that will become norms throughout their time at Western. From a technical perspective, the largest times for waste dumping on campus are at the beginning and ends of the school year (Nathan King). This relates to trash from student move-in and outs, as well as new technology in academic building, packaging waste from sports equipment, etc. The goal is to focus "Western Waste Education" for both staff and students in the first four to six weeks of the school year. For freshman and new students, this would start at orientation. It is recommended every student is supplied with a reusable food and drink container, completes a tour of campus waste, recycling and compost facilities, and participates in a mini-waste audit. The study has shown that most people do not think of waste beyond putting their trash in a garbage can. Therefore if the gap between the waste basket and where that waste goes is

bridged, engagement has succeeded, and we are on our way to increasing Western Diversion rates. For staff, it is suggested department-specific engagement activities. For example, new hires would go through a short waste training, led by a student, custodial and administrative staff partnership. This would create ownership among diverse campus groups in the waste stream, and teach respect for the hard work Western's custodial and administrative staff do.

7.3 Remover Paper Towels, Add Hand Dryers

Western's facilities department purchases 350 cases of paper hand towels each year. The towels consist of a mix between Genuine Joe Brown brand (\$28.13 a case) and Kimberly Clark bleached towels (\$26 a case). The total amount per year spent on paper towels is between \$9,100 and \$9,850. This cost does not include the garbage bags needed to hold the paper hand towels post use or the overhead costs of custodial services. Excel hand dryers website provides an on-line calculator to determine the payback period of switching from paper towels to hand dryers. The tool accounts for overhead costs of the towels and energy and installation costs of the hand dryers. Western's facilities department reports that there is 60 restroom facilities on-campus. For this report it is assumed adding one additional hand dryer to each restroom at a cost of \$600 installed. The findings from the calculator show a 30 month payback period for the switch, after that Western would be saving the costs of paper towels every year. The findings from the calculator are included in the appendix.

7.4 Find Sustainable Alternatives to Disposable Food Service Items

As outlined in the Purchasing Audit, a great deal of funds are spent on food service "paper goods" that are destined for the landfill. Due to health code restrictions, some limitations apply. Some more sustainable solutions do exist. In summary, the "Choose to Reuse" program should be expanded upon through a collaboration between Residence Life, Orientation, and Sodexo. In addition, incentives for using reusable beverage containers should be provided through the Sustainability Fund. Lastly, research into appropriate take-out containers that are closer to the size of the paper trays currently being used at Mad Jack's and Waldo's Cheesie Grill should be performed, as a comparable alternative would cut costs and substantially decrease the volume of paper trays and paper tray inserts being used on campus. For more detailed information on sustainable alternatives to disposable food service items, see section 6.2.4.

7.5 Increase Reusable Container Usage

By leveraging the partnership with Sodexo (the provider of food services on Western Campus), the university has the potential to avert waste from the stream by promoting reusable container use for food items (as opposed to disposable food ware). The top place on campus where food items are purchased to go is Mad Jack's (Waldo's Cheesie Grill) in the University Center. Thus, this program, and an associated marketing campaign should be concentrated at this food service location. We suggest the following:

• Every Freshman be provided a "Choose to Reuse" food container and cup as part of their orientation packet.

- Every new hire be provided a Choose to Reuse container set.
- Choose to Reuse container set (Food and Drink vessels) be made available for purchase at Mad Jack's for entire university population for \$8.
- When a Choose to Reuse container or cup is presented at time of purchase, the customer receives 25% of their entire bill. This sum would be supplemented from a grant-funded through the campus sustainability coalition.
- If people bring their own reusable containers or cups (non-Choose to Reuse branded), they receive 20% off.
- The Choose to Re-use container set remains the only to-go container that is able to be use in the Rare Air Café dining hall.

7.6 Mad Jacks Engagement

As laid out in 7.5, there is great opportunity with Sodexo's "grab and go" café to increase overall campus diversion rate. We see the main opportunities as being: (1) shifting disposable food service items to items that fit our current recycling and compost stream, and (2) encouraging the use of reusable containers as an alternative to single-use containers and cups. For example, Jamba Juice Smoothies are currently served in #5 plastic cups that are not recyclable in our current recycling program with the City of Gunnison. We suggest shifting these cups to #1 or #2 plastic. As detailed in the purchasing section of this report, Sodexo has demonstrated that they are supportive of these initiatives and very willing to work with the campus administration. The next step would be outlining which food service products make the most sense to shift to more sustainable options. Our initial suggestion are to focus on the top five (by volume) most ordered products: (1) paper Pepsi cups, (2) Seattle's Best coffee cups, (3) and (4) sandwich containers, and (5) paper liners.

7.7 Create Zero Waste Displays in Each Campus Building

Each building on campus should feature a relevant Zero Waste display in a visible location. For example, the Zero Waste display in a residential building should feature proper recycling and waste receptacles, information about where to compost on campus/what is compostable, facts relating to waste generation at Western (taken from this toolkit), a FreeCycle donation bin, and bins for appropriate TerraCycle collection items, such as for the Health and Beauty Brigades and its accompanying literature. The displays should be "refreshed" at least once per semester by collaboration between Residential Life and the LEAD Office Sustainability Coordinators. The Zero Waste Displays in each academic and administrative building would be similar but relevant to its respective building. For example, bins for TerraCycle's E-Waste and Writing Instrument Brigades would be appropriate to academic buildings, but the Health and Beauty collection program would not. For more information, see corresponding sections on each specific program and the appendix.

7.8 Remove Landfill Bins from Classrooms and Offices

A main component of the zero-waste toolkit involves limiting the ease of access to single stream solid waste receptacles. As 7.7 identifies it is proposed to increase the number of sorting stations. To implement zero waste it is also recommended that Western adopts a policy that only allows for

waste cans in such sorting stations. This would force the sorting of all waste as well as encourage the culture of zero waste.

7.9 Color Coding Trash Bags

Warren Wilson College pioneered a waste-coding system where trash bags were colored to identify streams. This system made it easily identifiable for campus community members to ensure waste, recycling and compost were ending up in the correct streams. Something like this on Western's campus, where perhaps all landfill trash is in clear bags, and plastic and glass recycling are in green bags would be an effective means of informing the campus community. This could help prevent recycling from ending up in landfill dumpsters, which could greatly increase Western's diversion rate.

7.10 Streamlined Purchasing System

A streamlined, campus wide, business-to-business e-marketplace, such as <u>Tufts University's</u> <u>Marketplace system</u> (Finance Department, 2015), will save WESTERN STATE COLORADO UNIVERSITY money through bulk purchasing and increased operations efficiency. This top town approach limits the products available for purchase to sustainable options, and increases the bulk buying power of the University. Bulk and streamlined purchasing is simply good business practice. According to Joe Worth at Entrepreneur Magazine, "A smartly run purchasing department will avoid duplication of effort and can reduce costs through the purchase of larger quantities at reduced shipping rates. " Of course, there are many secondary environmental benefits as well, including emissions savings from shipping. The Facilities Department already uses bulk purchasing for economic and environmental benefits. The Paper Clip, a popular Gunnison based distributor, could provide a cheap and easy streamlined purchasing solution, if they were willing to limit options to the most sustainable choice and become the official primary supplier for WESTERN STATE COLORADO UNIVERSITY. This practice would also allow purchasing to be monitored and baselines established.

7.11 Hold and Sell Aluminum at Market Price

As the ENVS 620 waste audit identified, Western throws away about 4,972 lbs of aluminum each year and recycles 5,020 lbs. This combined total of 10,000 pounds of aluminum is worth about \$0.39/pound on the current market, the approximate value of this aspect of the waste stream is currently valued at \$3,914. Rather than recycle through the City of Gunnison or throw away the aluminum cans if Western had the capacity to hold onto this volume of aluminum it could be sold on the commodity market and the monies could be used to fund additional zero waste initiatives.

7.12 Waste Management Contract Options

Discussions with Nathan King have highlighted the limited options that exist for waste management services in the Gunnison Valley. Waste Management, the company that holds the current contract, is the only entity that is currently capable of providing the large scale services required for

Western. This clearly limits both the university's ability to negotiate rates and find alternative providers. At this time no other options are available.

Zero Waste initiatives will alter the use of contracted waste services but are unlikely to generate significant savings. For this reason, the lack of alternatives providers does not severely impact the motivation for the initiative. Rather, leverage for Zero Waste will come from high level administrators who want to improve the school's image and from community members that possess intrinsic motivation. Documents related to the current contract are included in this folder for future reference.

7.13 Address City Recycling Infrastructure

The limited list of acceptable items to the Gunnison Valley Recycling Facility has been identified as a barrier. The following items are currently accepted in the indicated conditions only:

- 1. Aluminum (Cans only)
- 2. Alkaline batteries (Drop-off at Gunnison and Crested Butte post offices)
- 3. Corrugated Cardboard (No waxed cardboard is allowed)
- 4. No Styrofoam or Packing Peanuts
- 5. Glass Brown, green, and clear (Must be separated, remove lids and plastic or metal rings)
- 6. Magazines and Catalogues (May be recycled with newspaper)
- 7. Newspaper (Including all supplements from the paper)
- 8. Office Paper

a. Must be delivered to the Recycling Center between Monday through Friday, 8 a.m. to 4 p.m., while an attendant is on duty

b. May include all office papers except: Neon bright papers, manila envelopes, paper with excessive amounts of red ink, copied items that are mostly black

9. Plastics (Number 1 and 2 plastics, rinsed, and smashed)

10. Tin / Steel Cans (Remove paper labels and rinse cans)

By increasing the types of plastics accepted, lessening the requirements of the condition in which items such as glass, plastic and tin are accepted in and allowing for a more diverse stream of cardboard, the recycling facility could assist Western immensely in increasing diversion rates. This will require reaching out to the county as a stakeholder and discussing options for

improving/adding infrastructure and resources at the facility. The first step is to contact the center at (970) 641-0044.

7.14 Provide Indoor Sorting for Dorm Room Recycling

Feedback on the Toolkit was given during the Fall Forum Poster Session by many of the undergraduates living on campus. According to the students, one of the largest deterrents to using the provided recycling infrastructure is that they do not enjoy sorting their recycling outside during the winter months. The feasibility of two alternative options should be inquired into: providing small sorting bins to each individual unit or creating larger scale indoor sorting infrastructure.

7.15 Increase Compost Education at Rare Air Café

Presently, only two students are tasked with operating the Earth Tub, monitoring the compost operations in the Rare Air Cafe, and creating compost campaigns and outreach materials. The hard work and leadership exhibited in these two students are admirable, but their efforts would go further if they had a larger "Compost Crew" to assist them. The Compost Education Station in the Rare Air Cafe is located in an optimal location, but it should be updated regularly and remain neat and attractive. Compost outreach and education should be implemented in each of the residential halls. Compost Crew members should be provided with uniforms. Marketing for the brand new "Clean Your Plate" club should be expanded. For the grand prize each semester, it is recommended that a ski pass or equally substantial prize be offered. Please refer to section 6.2.5 for more information about composting initiatives on campus and their respective recommendations.

7.16 Ban the Sale of Bottled Water on Campus

Removing bottled water for retail on campus would be a fairly straightforward but important student project. For information on the current status of bottled water sales at Western, see the box titled "The Truth About Bottled Water at Western" under section 3.4.4.

7.17 Reinvest savings from Zero Waste into Revolving Green Fund

As identified in previous recommendations the potential savings from aluminum and paper towels total \sim \$13,000 a year. This does not include the potential savings from reducing waste collection, overhead from custodial services, and the potential reduced emission offset purchases. It is recommended that a portion of these savings realized by the campus are then reinvested into furthering zero-waste. The specific amount to be reinvested is to be determined by Nathan King and the Sustainable Action Committee (SAC).

7.18 Audience-Specific Engagement

As outlined in the Communications Plan, audience-specific engagement is key to successfully increasing Western's diversion rate. *What this means is engaging with key stakeholder audiences on campus in specific ways that best fit each group.* For example, all 80 administrative purchasers at Western can benefit from education around the adopted Socially and Environmentally Responsible Purchasing Plan, adopted in 2011. This plan mimics green purchasing guidelines adopted by the USDA and the EPA. Additionally, implementation a Green Office Certification program would allow for offices to showcase and be recognized for their sustainability efforts. Widespread attention for such a program would have a ripple effect among WESTERN STATE COLORADO UNIVERSITY offices and purchasers. Key audiences to engage (with a suggestion for engagement) are as the follows:

- Custodial Staff once a semester coffee and doughnut talks to check0in with facilities, and begin to understand some of their hindrances to ensuring recycling stays out of the landfill.
- Administrative Staff twice a semester coffee check-ins, to begin the process of combined, wholesale ordering of office materials like paper.
- Facilities Staff efforts to increase sustainability on campus. Checking in routinely and working on the aluminum hold-back project
- Faculty Engaging faculty through departmental champions, and new-staff orientation, and warming them to the idea of limiting waste-baskets on campus.
- Students targeted social media campaign and orientation engagement.

7.19 Identify Department Ambassadors

Department Zero-Waste Ambassadors can include those within departments involved in the purchasing process, club and organization heads, department heads or any other faculty member who is interested in the progression of Western becoming a zero-waste campus. The objective of the Department Ambassadors would be to inform the department staff, faculty and student of zero-waste project status, and to engage and educate these people on current efforts.

7.20 Identify Student Ambassadors

Student Zero-Waste Ambassadors can include both paid employees and volunteers. Paid employees include, but are not limited to, members of the existing Sustainability Coordinators Group, interested residential directors of the campus dormitories, and Master in Environmental Management (MEM) Sustainability Mentors. Eventually, Zero Waste Ambassadors can develop as it's own entity and include interested student volunteers from a variety of backgrounds. Such an entity can manage TerraCycle and FreeCycle operations, assist the Western Facilities department during Recyclemania, maintain the Earth Tub function, hold events and contests, and promote Zero Waste through whichever creative avenues are appropriate. The beginning of each semester, particularly in the fall, is a critical time to recruit interested students.

7.21 WESTERN STATE COLORADO UNIVERSITY Year-End Move Out: Expanding Waste Sorting

In recent years, observational and qualitative data has been collected by Western Residence Life and Facilities staff concerning yearly move out of on-campus dormitories and apartments at the end of the academic school year following the conclusion of the spring semester. Currently, waste receptacles at WESTERN STATE COLORADO UNIVERSITY on campus housing are overwhelmed during move-out weeks prior to the summer break, and often times waste is co-mingled with a lack of adequate (or over-whelmed) recycling sorting receptacles. This is exemplified most with a lack of 'e-waste' recycling options, and is exacerbated by limited facilities budgets to effectively divert 'ewaste' and other recyclables. Recommendations are as follows:

- Future WESTERN STATE COLORADO UNIVERSITY Zero-Waste Implementation Team should seek partnerships with existing WESTERN STATE COLORADO UNIVERSITY student organizations or clubs to champion appropriate and effective waste diversion;
- Increased outreach and awareness surrounding yearly move-out weeks at the conclusion of spring semesters;
- Fundraising efforts to increase capacity for 'e-waste' diversion and collection prior to waste deposit;
- Development and cultivation of "Residential Green Team" volunteers and/or employees during move-out weeks for each respective on-campus housing building, who would monitor and assist WESTERN STATE COLORADO UNIVERSITY staff with appropriate waste diversion.



Appendix:

8.7 WSCU Behavior Assessment and Waste Assessment Survey

Note: In accordance with Western State Colorado University's, Human Research Committee and federal policy pertaining to the protection of human subjects (45 CRF part 46, as amended), it may be necessary to submit the following WSCU Waste Assessment Survey for approval to the Human Research Committee prior to collecting behavioral and waste data. Further detail and contact information can be found here: <u>http://www.western.edu/academics/academic-affairs/institutional-research/human-research-committee</u>

This survey is designed to serve as a template for future WSCU Waste Assessment and sustainability behavioral assessments amongst WSCU stakeholders. It should be noted, that as it stands, this survey is directed to serve assessment of the WSCU student body. It can be amended to include more specific stakeholders, i.e. Faculty/Staff and WSCU Admin. It is recommended to be conducted through in-person interviews and through other outreach/awareness initiatives, i.e. email blasts, social media, etc.

As a recommendation, members of Dr. Brooke Moran's 620: *Environmental Leadership and Sustainability Consulting* course would encourage future members of a WSCU Zero-Waste Implementation Team to allow adequate time to comply with WSCU's Human Research Committee (HRC) <u>ibr@western.edu</u>, (970)943-3045, or by accessing the Human Research Committee website, above.



Western State Colorado University Waste Assessment

The following questions are meant to investigate and collect baseline data on campus' current engagement around waste, waste streams, and zero waste opportunities. This survey is being offered by the Masters in Environmental Management *Environmental Leadership and Consulting Course (Teacher, Dr. Brooke Moran)* to determine the level of stakeholder knowledge on waste on campus and Western's existing efforts towards mitigating landfill refuse.

Please answer the following:

1. Rate your familiarity with WSCU efforts to reduce waste on campus:

- a. None at all
- b. Below Average
- c. Average
- d. Above Average

Please elaborate on your level of knowledge - if you know of efforts, what are they? If you do not know of any efforts, what questions do you have?

2. Do you recycle? a. Yes b. No

If so, what do you recycle? Examples of items you recycle:

3. Are you aware that currently on campus ONLY #1 and #2 plastics, office pack, non-waxed cardboard, and glass are recyclable? Additionally, these all must be sorted?

- a. Yes
- B. No

Do you see this as a barrier to your participation, or others participation in recycling? Why or why not?



- a. Never
- b. Sometimes
- c. Most of the time
- d. Always

5. How important is it to you to recycle?

- a. Not important
- b. Important
- c. Sometimes, when it's easy

6. Do you compost? If yes or sometimes, how often?

- a. Yes
- b. No
- c. Sometimes

7. If "no", what would help you compost?

- a. Increased awareness
- b. More compost bins around campus
- c. A compost "pick up" for students
- d. I still would not compost

8. Would you support an initiative to include a Sustainability/Environmental Studies course as part of Western core curriculum?

- a. Yes
- b. No
- c. Indifferent

9. Would you support an initiative to including a "Waste Education" component to the freshman orientation activities? This could include, but not limited to, trash sorting, recycling education, and a tour of campus compost facilities.

- a. Yes
- b. No
- c. Indifferent

10. Do you see a benefit to including a "Waste Education" component to staff orientation and training activities?

- a. Yes
- b. No
- c. Indifferent

11. Do you use a reusable coffee mug and/or water bottle?

- a. Yes
- b. No
- c. Sometimes (maybe range here: 1-2 times/month, 1-2/week, etc.)

12. Would you support a campus wide initiative to remove bottled water from all vending machines and at campus events?

a. Yes

b. No

13. Would you support an initiative for WSCU to remove trash cans from buildings on campus and increase recycling and compost bins?

- a. Yes
- b. No
- c. Indifferent

14. Would support eliminating trash cans from classrooms and creating one collection point for each building with multiple waste stream options?

- a. Yes
- b. No
- c. Indifferent

15. Would you support an initiative for Western to move to a "Zero Waste" system?

- a. Yes
- b. No

Zero Waste means moving from a linear waste disposal system to a cyclical resource management system. "If a product can't be reused, repaired, rebuilt, refurbished, refinished, resold, recycled or composted, then it should be restricted, redesigned, or removed from production." The technical goal of a Zero Waste campus is 90% of waste being "diverted" from the landfill.

16. Our initial research has should that up to 60% of current landfill trash on campus could be being diverted to recycling or compost streams. How does this make you feel?

- a. This is unacceptable
- b. I have no opinion on the subject
- c. I do not see this as an issue

17. Would you support an initiative to ensure office purchasing that met our recycling stream requirements, even if this meant potential increased costs of copying and cafe items on campus?

- a. Yes
- b. No

c. Indifferent

18. Would you support an initiative to remove paper towels from bathroom across campus, leaving solely hand dryers?

a. Yes

b. No

c. Indifferent

19. Please add any additional comments in the space below: ideas for more reducing waste, opportunities for outreach to students or staff, key stakeholders to be interviewed.

Waste Audit Results Spreadsheets:

Academic					
Buiding		%	yd³ /	lbs/week (Recylmania	Lbs School year (8
(average)	yd³	Sample	week	source per yd³)	months)
Solid Waste	0.639	38.19%	2.292	206.252	6600.072
Plastics	0.333	19.90%	1.194	42.993	1375.790
Cardboard	0.110	6.58%	0.395	39.450	1262.403
Aluminum	0.022	1.32%	0.079	4.971	159.063
Industrial					
Compost	0.402	24.03%	1.442	129.755	4152.158
Compost	0.025	1.49%	0.090	17.932	573.819
Glass	0.003	0.18%	0.011	6.455	206.575
Paper	0.130	7.77%	0.466	225.655	7220.944
#6	0.009	0.54%	0.032	1.162	37.184
Total:	1.673	100.00%	6.000	674.625	21588.007

Res Life Buildings	yd³	% yd ³ / Sample week		lbs/week (Recylmania source per yd³)	Lbs School year (8 months)	
Solid Waste	0.183	40.10%	6.456	580.997	18591.902	
Plastics	0.098	21.47%	3.457	124.454	3982.528	
Cardboard	0.075	16.43%	2.646	264.571	8466.258	
Industrial						
Compost	0.033	7.25%	1.168	105.087	3362.798	
Aluminum	0.023	5.04%	0.811	51.115	1635.681	
Compost	0.016	3.46%	0.557	111.472	3567.117	
Tin	0.012	2.54%	0.409	61.380	1964.172	
Paper	0.009	1.91%	0.307	148.540	4753.296	
Glass	0.008	1.80%	0.289	173.558	5553.865	
			16.10			
Total	0.456	100.00%	0	1621.175	51877.615	

Paul Wright Gym	% yd³ sample		yd³/w eek	lbs/week (Recylmania source per yd ³)	Lbs School year (8 months)	
Solid Waste	0.210	37.07%	4.634	417.034	13345.102	
Plastics	0.053	9.36%	1.169	42.101	1347.220	
Carboard	0.074	13.06%	1.633	163.283	5225.066	
Industrial						
Compost	0.151	26.65%	3.332	299.868	9595.763	
Aluminum	0.012	2.12%	0.265	16.681	533.804	
Tin	0.001	0.18%	0.022	3.310	105.914	
Compost	0.008	1.41%	0.177	35.305	1129.744	
Paper	0.051	9.00%	1.125	544.660	17429.126	
Glass	0.005	0.88%	0.110	66.196	2118.270	
E-Waste	0.002	0.26%	0.033	2.979	95.322	
			12.50			
Total	0.567	100.00%	0	1591.417	50925.331	

FOODSAVE DIY FOOD WASTE AUDIT

It's estimated that businesses in the food and hospitality services sector throw away £10,000 worth of food waste a year.

Reducing food waste can therefore lead to significant financial as well as environmental savings.

The only way to reduce food waste is to measure it. The steps below will guide you through the process...

1. PLAN

- > The first step is to review your current waste disposal practices and choose dates which reflect normal operating conditions to run the audit Next, appoint a food waste champion to drive
- Next, appoint a food waste champion to drive the process and encourage the team to take part
- Finally, select the location of your audit (e.g. kitchen, bar, front of house - you might want to cover some or all or these)

2. DO - Waste Audit 1 (3 days)

- Set up three food waste bins, one for prep, one for spoilage, and one for plate waste
 Train the team to separate waste accordingly
 Each day, record the weight of each bin using
- handheld scales
- Note down the weight and the number of covers on the Food Waste Tracking Sheet overleaf

3. REVIEW

- Enter your data into the Food Waste Calculations Sheet to see your what proportion of your total waste is prep, spoilage and plate, your waste costs per cover and your annual waste costs Analyse your results; think about where your waste comes from and what the biggest
- contributors are. You will find resources to help you with this on the FoodSave website

WASTE STREAMS

Spollage = Produce that has gone off, or has been contaminated, and is unusable Prep = Food waste generated as part of the menu

Mall

preparation and cooking process (e.g. veg and meat trimmings, cooking errors and prepped food that's cooked but not served) Plate = Prepared food that comes back from the customer

FoodSave

Plan

00

4. ACTION PLAN

- Based on your results, plan actions to reduce >
- Again, you'll find loads of tips on how to reduce waste from businesses just like yours under the Resources section of the FoodSave website
- Brainstorm ideas with the team and together set 5-10 waste goals to work towards

5. REPEAT THE PROCESS

- Measure your food waste using the same process as before to see if it has reduced >
- You could repeat the process once a month, once a quarter, or once every six months
- The key thing is to keep measuring regularly

6. REVIEW

- > Analyse your results to see if you have reduced the amount of food waste you are producing
- Determine how effective your goals were and identify areas for future waste reduction
 Plan your next steps

FoodSave is a project helping London-based small to medium sized food businesses reduce food waste, put surplus food to good use and ensure that unavoidable food waste is managed more sustainably If you'd like to know more, please visit www.foodsave.org or contact the FoodSave team: email foodsave@thesra.org or call us on 020 7479 4245



	Type 1:	Type 2:	Type 3:
	Bulk auditing (large audits)	Individual bag contamination rate auditing	Individual bag & sub-categorization auditing
Personnel	 1 audit coordinator (can also weigh the bins since frequent weighing not required) Sorters (as many as possible) 	 1 audit coordinator Recommended team composition of: 1 data recorder and 2 groups of 2 sorters Disposal Team -OR- sorters dispose of their own waste (recommend 1 disposal team of 4-6 people per 4 teams of sorters) 	 1 audit coordinator Recommended team composition of: 1 data recorder and 2 groups of 2 sorters Disposal Team -OR- sorters dispose of their own waste (recommend 1 disposal team of 4-6 people per 4 teams of sorters)
Equipment	 Disposal bins for each category of materials being measured 1 scale that can weigh the disposal bins 1 auditing package per group 	 4 sorting bins per team (2 per group) 1 scale per team Disposal bins 1 auditing package per group 	 6 sorting bins per team (2 per group plus an additional 2 for the sub-categorization bags) 1 scale per team 0 bisposal Bins 1 auditing package per group
Procedures	 Weigh and Open up a bags (of the audited waste stream for example garbage stream) and empty the contents into the proper disposal bins (or bags) by material When all of the bags are gone or the disposal bin is full, weigh each bin. This will give weights of all materials found in this particular stream and % of contamination can be calculated. Additional bins may be used for further sub- categorization of the waste streams (ie: separation of paper into fines and newsprint, or recyclables into refundable beverage containers and others) Notes should be made of material found in what approximate quantity if further sub-categories are done. 	 Open up the bag of the waste stream being audited and separate contents into two bins 1) properly sorted materials and 2) contaminants Once the bag contents have been fully separated, weigh the bins Once the bin weights have been recorded, sort the waste into disposal bins according to local area requirements (if a disposal team is on hand, give them the bins full of waste and take 2 empty bins and continue sorting through more bags until there are no remaining bags) 	 Decide how many bags will be sub-categorized (20% = 1 in 5 bags) The data recorder will tell the groups when they must sub-categorize waste. For these bags, additional bins will be needed (one for each category of waste being measured) Open up the bags of waste and separate contents into the bins according to properly sorted materials and contaminants (or into all waste streams if sorting through a detailed bag) Once the bag contents have been fully separated, weigh the bins Disnosal the same as type 2
Benefits	Detailed breakdown data for all audited waste Less data recording required No additional disposal step required as material is source separated.	 Will yield data on individual bags and allow for identification of outliers Can measure percentage of bags that meet adequate contamination rates 	 Same benefits as type 2 auditing Yields information regarding the material composition of the waste streams and contamination
Drawbacks	 Individual bag data cannot be measured 	 Weighing individual bags is time consuming More susceptible to data entry errors Requires a scale and sorting bins for each team of sorters Waste must be disposed after each bag is audited. Will require a disposal team 	 Same drawbacks as type 2 contamination auditing Will require more sorting bins for each team Will take more time than type 2 due to extra sorting and weighing Detailed data is more susceptible to outliers

XLERATOR® HAND DRYER COST SAVINGS AND ENVIRONMENTAL IMPACT ANALYSIS

XLERATOR represents a 95% Cost Savings versus paper towels and eliminates their labor, maintenance and waste. Fill out the shaded boxes below to see how much you can save.

PAPER TOWEL COSTS					
1. Number of Cases of Paper Towels Used A	nnually				
2. Cost per Case Delivered (Include Freight and	d Tax; typically	\$15.00 - \$25.00/case)			
 Number of Towels per Case (For example: 2 4,000/case for Multi-fold towels; 4,800 linear for 	2,400/case for (ft/case for Roll	C-fold towels; Towels)			
4. Your KWH Rate (typically \$.10 per KWH)					
5. Total Paper Towel Costs per Year			\$0.00		
Handling Cost			\$0.00		
(50% of item lotal Paper lowel Costs - Includes th and purchase orders, receiving, storing, servicing t	e cost of gener towel dispense	rating requisitions rs, collecting and	(To enter your of	wn handling cost,	
disposing of used towels.)			uncheck this bo	w.)	
6. TOTAL COST OF USING PAPER TOWELS PI	ER YEAR		\$0.00		
HAND DRYER COSTS					
7. Number of Paper Towels Used Annually			0		
(Item 1 multiplied by total sheets per case)					
8. Number of Hand Dryings Annually (Item 7	divided by 2.51	towels per hand dry)	0	XLERATOR	XLERATOReco®
 Hours of Hand Dryer Usage (Item 8 divided by 120 hand dries per hour; Use 	240 hand drie	s per hour	0	0	0
for XLERATOR and 240 for XLERATOReco					
 Cost of Electricity per Hour (2.2 KW multipl Use 1.5 KW for XLERATOR and .5 KW for XLERATOR 	lied by your KW ATOReco)	/H rate;	\$0.00	\$0.00	\$0.00
11. TOTAL ANNUAL HAND DRYER COSTS (Lir	ne 9 multiplied	by Line 10)	\$0.00	\$0.00	\$0.00
12. YOUR ANNUAL SAVINGS* (Item 6 minus Ite	em 11)		\$0.00	\$0.00	\$0.00
COMPUTE YOUR % SAVINGS (Item 12 divided I	by Item 6)		0.00%	0.00%	0.00%
XLERATOR ENVIRONMENTAL SAVI	NGS				
Annual Climate Change Benefits (kg CO2 Eq. re	educed)				
Pounds of Paper Towel Waste Eliminated					
Percent Reduction of Carbon Footprint					
THIS IS THE CO, SAVINGS EQUIVALENT TO					
Trees Saved					
Cubic Meters in Landfill Saved					
Gallons of Water Saved					
Emissions Saved from # Gallons of Gasoline					
Source of conversion = USEPA					
CALCULATE YOUR PAYBACK					
Cost of Each Dryer					
Installation Cost (Typically \$125 - \$200/dryer)					
Number of Hand Dryers Purchased (**See No	te Below)				
13. Total Purchase Price			\$0.00	XLERATOR	XLERATOReco
PAYBACK PERIOD IN MONTHS (Item 13 Divide					
the second second second second	ed by Item 12 X	12 Months)			
 Based on the naw cost of paper towels, not including h	ed by Item 12 X andling costs. Int for most appli- very three washib s, one dryer shoul	12 Months) cations. If restroom traffic is unusually asins in larger installations. When a 5- id be mounted at recommended height	heavy, we suggest one dryer per 4" round-type washbasin is used, for the handicapped.	Print Clear Fi	elds Email

WARM Summary

close or Esc K

Analysis of GHG Emissions from Waste Management for Western

Total Change in GHG Emissions: (MTCO2E):	-353
GHG Emissions from Alternative Waste Management Scenario (MTCO2E):	-239
GHG Emissions from Baseline Waste Management Scenario (MTCO2E):	114

Baseline Scenario						Alternative Scenario						
Material	Tons Recycled	Tons Landfilled	Tons Combusted	Tons Composted	Total MTCO2E	Tons Source Reduced	Tons Recycled	Tons Landfilled	Tons Combusted	Tons Composted	Total MTCO2E	Change (Alt - Base) MTCO2E
Aluminum Cans	0	2	0	N/A	0	0	2	0	0	N/A	-23	-23
Glass	0	8	0	N/A	0	0	8	0	0	N/A	-2	-3
Mixed Paper (general)	0	25	o	N/A	40	0	25	o	0	N/A	-88	-128
Mixed Paper (primarily from offices)	o	31	0	N/A	64	0	31	0	0	N/A	-113	-176
Mixed Plastics	0	12	0	N/A	0	0	12	0	0	N/A	-13	-13
Food Waste	N/A	6	0	0	10	0	N/A	0	0	6	-1	-11




TO MONTROSE

U.S. HIGHWAY 50 - (TOMICHI AVE.)

TO DENVER/COLORADO SPRINGS-

Week of	October 20, 2014									1 lbs = .45 kg
										1 ton = 907.2 kg
Acct #	Account	Container Size			Use	of Co	ntaine			
	Dumpster	Dumpster Size	Yards	Monday	Tuesday	Wed	Thursda	Friday	Total	
005-3104	Bone Yard	30 RO	30		1			()		
005-818	Aspinal Wilson Ctr	2FL	2							
005-8349	College Ctr - VIP	6FC	6							
005-823	Crystal Tomichi	8FL	8	5		3.5		5.5	14	
005-825	Dolores Hall	8FL	8	5		4		6	15	
005-830	Hurst Hall	6FL	6					6	6	
005-827	Fieldhouse	8FL	8	5				7.5	12.5	16.1
005-9280	Pinnacles	8FL	8	7		6.5		6	19.5	
005-9271	Pinnacles Gable	30 RO								
005-841	Quigley	6FL	6					6	6	
005-843	Robidoux Hall	8FL	8	6.5		4		8	18.5	
005-845	Taylor Hall	6FL	6					6	6	
005-834	Whip Maint Bldg	6FL	6					6	6	
005-9580	Mears Hall	6FL	6	4.5		5.5		3.5	13.5	
		TOTAL YARDAGE =	108							
		Total yards picked up		33		23.5		60.5	117	
		Total estimate (90 lbs/y	/ard^3)	2970		2115		5445	10530	Total lbs waste/wk
						Tons	waste for	the week	5.3	
			Lbs waste per school year (8 months				366,444			
			Tons waste per school year (8 months)					183.2		
Boneyard	rolloff (30yd) dumped 12	times/yr @ 7.5 tons eacl	h = 90 to	ns			Lbs waste	per year	547,560	
Res Hall ro	olloffs (3 x 30yd) dumped	once @ 7.5 tons each = 2	22.5 tons			Т	ons waste	per year	273.8	
Total rollo	ff weight dumped = 112.	5 tons/vr			Total Ca	mpus Wa	ste Yearh	/ Estimat	386.3	
]	Tons	recycling	per vear	90	
Recla-metals rolloff (dumped 4 times/yr @ 3 tons each) = 12 tons										
Metech bins (dumped 4 times/yr @ 0.5 tons each) = 2 tons							180000			
I otal weig	nt dumped = 14 tons/yr							45000		
								90		

Dear Colleagues,

I am pleased to announce that [Your Office/Department] has signed up for, and will be working to get certified under, the Tufts Green Office Certification Program with the support of [Supervisor/ Dean/etc.]. Run by the Tufts Office of Sustainability, the university-wide Green Office Certification Program supports, promotes, and recognizes offices that are engaging in environmentally sustainable practices. This program is a great opportunity for us to receive recognition for our office's green efforts and to identify areas of further opportunity and improvement.

How the Program Works:

In order to determine our office's eligibility for certification and benchmark our current sustainability progress, we will be filling out the Green Office Certification Checklist, which [is saved on our server or shared drive/posted in an office common space for your reference]. The checklist contains a number of criteria in the areas of Energy & Water Use; Waste & Recycling; Paper, Printing, & Office Supplies; Food, Beverages & Dishware; Transportation; and Sustainability Planning & Leadership. Based on the score we receive on the checklist, our office may achieve one of four levels of certification (Bronze, Silver, Gold, or Platinum). Our office has set a goal of achieving [Bronze, Silver, Gold, Platinum] certification by [Date].

Once we achieve certification, our office will be presented with an official framed certificate for display by the Office of Sustainability and will be recognized on the Office of Sustainability website and in the Office of Sustainability newsletter.

Over the next [timeframe (e.g., several weeks/months)], I may be reaching out to you for your assistance on various office-wide initiatives and help gathering information for the checklist. As you know, Tufts University is deeply committed to environmental sustainability, and our [office/department] is excited to demonstrate our progress and leadership in this important area.

I look forward to working with you on this project! If you have any questions, please let me know. To learn more about the Green Office Certification Program, please visit the <u>Office of Sustainability</u> website.

Thank you, [Your Name]





Hundreds of Colleges. Millions of Students. Get in the Game!

PARTICIPATING SCHOOLS	week 1	week 2	week 3	week 4	week 5	week 6	week 7	week 8
What is RecycleMania? RecycleMania is an annual, 8-week competition that promotes waste reduction and recycling standings and to find out more.								



UNACCEPTABLE WASTE: E-WASTE BRIGADE®





Tanks are ink holders and are not accepted through this program. They are identified by the lack of a copper strip as shown above. The above picture is an example of a generic tank. All tanks have a port to evacuate ink to a print head. Some tanks may have a small copper pad, but will not have a copper nozzle strip.

Also, please do not send in any of the items shown below. You will not earn TerraCycle points for these items and they will not count towards the 20-item shipment size requirement to earn TerraCycle points.



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ACCEPTABLE INKJET AND TONER CARTRIDGES: E-WASTE BRIGADE®

1. This program accepts inkjet cartridges from HP and Canon printers only.

Please read the list below to see which toner cartridges are accepted.

Please do not send ink tanks, ribbons, tubes, bottles, or remains. Review the list of unacceptable waste for more information.

List of Accepted Toner Cartridges:

Brother 420DB Brother 520DR Brother 620DR Brother 720DB Brother TN 420/450 Brother TN 720/750 Brother TN 780 Super HY Dell 5530 Dell B2360 Dell B3460 Dell B3465 HPC3909A/X (Series 5Si) HPC8061X (Series 4100) HPC8543X (Series 9000) HPCC364A (Series P4014/P4015/P4 HPCC364X (Series P4015/P4515) HPCC530A (Series CP2025/CM2320) HPCC531A (Series CP2025/CM2320) HPCC532A (Series CP2025/CM2320) HPCC533A (Series CP2025/CM2320) HPCE250A (Series CP3525) HPCE250X (Series CP3525) HPCE251A (Series CP3525) HPCE252A (Series CP3525) HPCE253A (Series CP3525) HPCE255A (Series P3015) HPCE255X (Series P3015) HPCE260A (Series CP4025/4525) HPCE260X (Series CP4025/4525)

HPCE261A (Series CP4025/4525) HPCE262A (Series CP4025/4525) HPCE263A (Series CP4025/4525) HPCE264X (646X)(CM4540) HPCE270A (Series CP5525) HPCE271A (Series CP5525) HPCE272A (Series CP5525) HPCE273A (Series CP5525) HPCE340A (651A)(Series M775) HPCE341A (651A)(Series M775) HPCE342A (651A)(Series M775) HPCE343A (651A)(Series M775) HPCE390A (Series M4555) HPCE390X (Series M4555) HPCE410A (305A)(M351/M451) HPCE410X (305A)(M351/M451) HPCE411A (305A)(M351/M451) HPCE412A (305A)(M351/M451) HPCE413A (305A)(M351/M451) HPCE505A (Series P2035/P2055) HPCE505X (Series P2035/P2055) HPCE740A (307A)(Series 5225) HPCE741A (307A)(Series 5225) HPCE742A (307A)(Series 5225) HPCE743A (307A)(Series 5225) HPCF214A (700/M712/M725) HPCF214X (700/M712/M725) HPCF280A (M401/M425) HPCF280X (M401/M425) HPCF283A (M127) HPCF325X (M806/M830) HPCF350A (130A)(M176/M177) HPCF351A (130A)(M176/M177) HPCF352A (130A)(M176/M177)

HPCF353A (130A)(M176/M177) HPCF380A (312A)(M476) HPCF380X (312A)(M476) HPCF381A (312A)(M476) HPCF382A (312A)(M476) HPCF383A (312A)(M476) HPQ1338A (Series 4200) HPQ1339A (Series 4300) HPQ5942A (Series 4250\4350) HPQ5942X (Series 4250\4350) HPQ5945A (Series 4345) HPQ5949X (Series 1320) HPQ5950A/HPCB400A HPQ5951A/HPCB401A HPO5952A/HPCB402A HPQ5953A/HPCB403A HPQ6511X (Series 2420/2430) HPQ7516A (Series 5200) HPQ7551X (Series P3005/M3035) HPQ7553X (Series LPJ2015) HPQ7570A (Series M5025/5035) LEX MS310/410/510/610 LEX MS710/711/810/811/812 LEX Optra Extra HY XS650/T654 LEX Optra T650/652/654/XS654 Ricoh SP 4100N/4110N Type 120 Ricoh SPC 310/320DN/410DN Samsung ML3050/3052 Samsung MLT-D203/MLT-D306 Xerox 106R01246 Phaser 3428 Xerox 106R01415 Phaser 3435 Xerox 106B1370/1371 Phaser 3600 Xerox 113R656/657 Phaser 4500 Xerox 113R711/712 Phaser 4510



ACCEPTABLE CELL PHONE: E-WASTE BRIGADE®

Please refer to the list below to learn how many bonus points you will earn for each cell phone through the E-Waste Brigade.

25 TERRACYCLE POINTS

Damaged/broken cell phone, or any model not listed below

250 TERRACYCLE POINTS

APPLE iPhone 4 ALL GB (8/16/32) APPLE iPhone 4C ALL GB (8/16/32) BLACKBERRY 9650 Bold BLACKBERRY 9850 Torch BLACKBERRY 9700 BLACKBERRY 9780/9790 Bold BLACKBERRY 9800 Torch BLACKBERRY 9810 Torch BLACKBERRY 9860 Torch BLACKBERRY 9900 BOLD BLACKBERRY 9930 Bold Caterpillar CAT B15 HTC Amaze 4G HTC DESIRE 510 HTC DESIRE 612 HTC DESIRE EYE HTC DESIRE HD HTC DROID Incredible 2 HTC First HTC HD2 HTC HD7/HD7S HTC Inspire 4G HTC myTouch 4G Slide HTC NEXUS ONE HTC ONE S HTC ONE VX HTC ONE X HTC Rezound HTC Sensation HTC Titan HTC Titan II HTC VIVID HTC Windows 8X LG C800 My Touch Q

LG E970 Optimus G AT&T LG LS970 Optimus G LG P769 Optimus L9 4G LG P920 LG P930 Nitro HD LG P999/ G2x/ Optimus 2x LG VS930 Spectrum 2 LG VS950 Intuition MOTOROLA Atrix MOTOROLA Atrix HD MOTOROLA DROID 3 MOTOROLA DROID Bionic MOTOROLA DROID MINI MOTOROLA DROID RAZR HD MOTOROLA DROID R M XT907 MOTOROLA DROID R MAX MOTOROLA DROID R MAX HD MOTOROLA DROID RAZR MOTOROLA MOTO X XT1055 MOTOROLA Photon MB855 NOKIA Lumia 800 NOKIA Lumia 810 NOKIA Lumia 820 NOKIA Lumia 822 NOKIA Lumia 920 NOKIA Lumia 925 NOKIA Lumia 928 SAMSUNG GT i9300 Global SAMSUNG SCH-i435 S Mini SAMSUNG SCH-i515/SPH-L700 SAMSUNG SCH-R530/SPH-L710 SAMSUNG SCH-R950 SAMSUNG SCH-R970 SAMSUNG SGH-i187 ATIV Neo

SAMSUNG SGH-i437 SAMSUNG SGH-i547 SAMSUNG SGH-i577 SAMSUNG SGH-i727 SAMSUNG SGH-i777 SAMSUNG SGH-i847 SAMSUNG SGH-i897 SAMSUNG SGH-i937 Focus S SAMSUNG SGH-i997 SAMSUNG SGH-T679 4G SAMSUNG SGH-T699 SAMSUNG SGH-T769 SAMSUNG SGH-T839 SAMSUNG SGH-T989 SAMSUNG SPH-D710 Epic 4G SAMSUNG SMG730A S3 Mini



1,000 TERRACYCLE POINTS

APPLE iPhone 4S ALL GB (16/32/64) APPLE iPhone 5 ALL GB (16/32/64) APPLE iPhone 5C ALL GB (16/32/64) BLACKBERRY Z10 BLACKBERRY Q10 CASIO GZONE Commando 4G HTC DROID DNA HTC ONE HTC ONE MAX (CDMA) HTC ONE MINI LG D725 G3 Vigor LG D885 G3 Vigor LG D800 G2 LG D820/821 Nexus 5 LG D950/959 G Flex LG E960 Nexus 4 LG E980 Optimus G Pro LG LS980 G2 LG VS980 G2

MOTOROLA DROID MAXX MOTOBOLA DROID Ultra MOTOROLA MOTO X XT1053 MOTOROLA MOTO X XT1056 MOTOROLA MOTO X XT1058 MOTOROLA MOTO X XT1060 NOKIA Lumia 929 NOKIA Lumia 1020 NOKIA Lumia 1520 SAMSUNG SGH-i317 SAMSUNG SGH-i337/SGHM919 SAMSUNG SCH-i535 Gxy S111 SAMSUNG SGH-i53 SAMSUNG SCH-i545 Gxy S111 SAMSUNG SCH-i605 SAMSUNG SGH-i717/T879 SAMSUNG SGH-i747 SAMSUNG SCH-R960 Mega SAMSUNG SPH-L600 Mega

SAMSUNG SPH-L720 SAMSUNG SPH-L900 SAMSUNG SGH-T889 SAMSUNG SGH-T999 SAMSUNG SMG900R4 Note 3 SAMSUNG SMW 750

4,000 TERRACYCLE POINTS

APPLE iPhone 5S 16GB HTC ONE M8 LG LS990/LS985 G3 SAMSUNG SPH-L600/R960 Mega SAMSUNG SMN900 A/P/T/V Note 3 SAMSUNG SMG900 A/P/T/V Note 3

7,500 TERRACYCLE POINTS

APPLE iPhone 5S 32GB APPLE iPhone 5S 64GB APPLE iPhone 6 16GB APPLE iPhone 6 32GB SAMSUNG SMN910 Galaxy Note 4





Green Mountain Technologies, Inc. The Composting Technology Company

Earth Tub™ Pricing & Specifications

Effective March 2013

The New Earth Tub (Version 9.0) is now available!

We've listened to our customers and incorporated great new features and benefits into the new Earth Tub design!

- Easier to mix! The tub and lid design has been modified for smoother turning of the lid.
- Better protection against rain! Lid has a new sloped design to help it shed rain water and prevent rain from
 entering the Earth Tub.
- No leachate requirements! Leachate is now recycled back into compost. No need to manage leachate.
- Easier to unload compost! The Earth Tub now has a new larger, discharge door that provides better access
 to the interior of the Tub.
- Easier to clean! No more perforated floor. The smooth surface of the Earth Tub tub floor makes removing
 compost and cleaning easier.
- Recycled content! The Earth Tub vessel is now made with recycled content plastic!*
- Cool new look! Enhanced structural design imparts a sleek, rugged aesthetic. Neutral colors look great in a
 variety of environments.

* Tub base is made of 50% post-consumer and 50% post-industrial recycled content plastic. Lid is made of 50% postconsumer recycled content plastic.

1 Earth Tub™ Package - \$9,975.00 (USD):

One Earth Tub™ Package provides all equipment required for a site to process up to 100 pounds of organic waste per day. For individual component pricing choose the custom package option.

Assembly Includes:

- Earth Tub™ LLDPE insulated plastic body and lid (89"x89"x72"/795 lbs. each):
 - o 2Hp 3 phase totally enclosed fan-cooled (TEFC) auger motor (208/230/460V 50/60 Hz)
 - o In-line Helical Gearbox with UHMW support bearing
 - 12" stainless steel auger and track assembly
 - o Optional leachate drain port
 - Locking discharge door and loading hatch
 - o Retractable electric cord
- One 36" hand-held temperature probe
- One Bio-filter which includes an aeration blower and odor filter
- 2" aeration ducting and fittings to connect Bio-Filter to Earth Tub

Contact: Tel (802)368-7291 Fax (802)368-7313 sales@compostingtechnology.com Green Mountain Technologies 5350 McDonald Ave NE Bainbridge Island, WA 98110

2 Earth Tub™ Package - \$17,895 (USD):

Two Earth Tub™ Package provides all equipment required for a site to process up to 200 pounds of organic waste per day. With this option, both units need to be sited in the same location if there is a desire to share electrical components (e.g., variable frequency drive).

Assembly Includes:

- Two Earth Tub™ LLDPE insulated plastic body and lid (89"x89"x72"/795 lbs. each):
 - 2Hp 3 phase totally enclosed fan-cooled (TEFC) auger motor (208/230/460V 50/60 Hz)
 - o In-line Helical Gearbox with UHMW support bearing
 - 12" stainless steel auger and track assembly
 - o Optional leachate drain port
 - o Locking discharge door and loading hatch
 - o Retractable electric cord
- One 36" hand-held temperature probe
- One Bio-filter which includes an aeration blower and odor filter
- 2" aeration ducting and fittings to connect Bio-Filter to Earth Tub

<u>3 Earth Tub™ Package - \$26,975 (USD):</u>

Three Earth Tub™ Package provides all equipment required for a site to process up to 300 pounds of organic waste per day. With this option, all units need to be sited in the same location if there is a desire to share electrical components (e.g., variable frequency drive). A three tub installation comes complete with two bio-filters.

Assembly Includes:

- Three Earth Tub™ LLDPE insulated plastic body and lid (89"x89"x72"/795 lbs. each):
 - 2Hp 3 phase totally enclosed fan-cooled (TEFC) auger motor (208/230/460V 50/60 Hz)
 - In-line Helical Gearbox with UHMW support bearing
 - o 12" stainless steel auger and track assembly
 - o Optional leachate drain port
 - o Locking discharge door and loading hatch
 - o Retractable electric cord
- One 36" hand-held temperature probe
- Two Bio-filters which includes an aeration blower and odor filter
- 2" aeration ducting and fittings to connect Bio-Filter to Earth Tub

Contact: Tel (802)368-7291 Fax (802)368-7313 sales@compostingtechnology.com Green Mountain Technologies 5350 McDonald Ave NE Bainbridge Island, WA 98110

Add-Ons:

- Earth Tub[™] Variable Frequency Drive \$895.00 (USD): A VFD is required for sites that lack 3 phase power. One VFD can be shared with multiple Earth Tubs using a retractable cord with quick-disconnect.
- Earth Tub[™] Positive Aeration System \$349.00 per Tub (USD): This recommended aeration system pushes air up though the compost, increasing oxygen levels, raising composting temperatures, speeding decomposition and preventing odors.
- Earth Tub[™] On-Floor Heating System \$299.00 per Tub (USD): This resistance cable heating system provides back-up freeze protection to the interior of the Earth Tub in case compost temperatures drop suddenly during severe weather. For maximum effectiveness, this heater is usually installed in concert with the Aeration System above.
- Additional Temperature Probes \$99.00 each (USD)
- One-Year Extended Warranty \$395.00 per year (USD): Extended warranties are available on our parts-only warranty. Limit two additional years of warranty extension beyond the standard one-year warranty.

*All prices listed do not include taxes, shipping or installation costs. Please contact us to receive a complete quote including shipping costs.



The Organic Recycling Company

THE EARTH TUB™ FREQUENTLY ASKED QUESTIONS

What is the Earth Tub \mathbb{M}^{p} - The Earth TubTM is a small scale, in-vessel composting system for recycling organic waste materials at the site where they are generated. Complete with a bio-filter for odor processing and control, this system provides a neighborhood friendly efficient composting technology. The Earth TubTM has been developed specifically to meet the composting needs of universities/schools, restaurants/cafeterias, commercial food processors, hospitals, multi-unit residential dwellings, camps and other institutional organic waste generators.

What is unique about the Earth Tub TM? - The Earth Tub offers the sophistication of large in-vessel composting systems to the small institutional generator at an affordable price.

What are the key features of the Earth Tub M?

- Modular and expandable design allows flexibility in application
- Bio-filter processes odors and accelerates the compost process
- High rate composting reduces volume and stabilizes material quickly
- Powered auger is thoroughly effective for mixing and shredding most foods
- Insulated design allows for operation under winter conditions
- Durable, heavy duty plastic construction (double walled rotomolded polyethylene)
- · Finished potting soil mixes can be blended within the Earth Tub by adding peat moss etc to compost

How much organic waste must an institution generate to use the Earth Tub^{me}? - For on-site composting, the Earth Tub^{me}? - For on-site composting, the Earth Tub^{me}? a processing as little as 40 lbs (20 kg) per day or as much as 500 lbs (250 kg) per day. The modular design of the system allows it to be adapted to a wide variety of applications and configurations.</sup></sup></sup>

How long will it take to fill the Earth Tubm? – Assuming a 5-6 day per week operation, it will take 13 weeks to fill an Earth Tub at 40 pounds per day, 5 weeks to fill at 50 pounds per day, and 3.5 weeks to fill at 150 pounds per day. Each unit has a total of 3200 lbs (1500 kg) biomass capacity when full. This data was collected at University of North Carolina, Charlotte installation.

What if your organic waste stream increases? - Expansion capability is one of the key features of the Earth Tub SystemTM. By virtue of its modular design, the system is ideally suited to incremental capacity increases. This system is a perfect application for gradually introducing composting to the institutional organic waste generators.

What are acceptable Materials for Composting?- The system is designed to process Kitchen prep waste and plate scrapings. Green garden waste and manures will easily compost in the system. Meats, cheese, and other fatty foods should be kept below 10% of total waste input. Avoid adding large pieces of meat, fats or oils to the system.

How cold can it be and still maintain compost temperatures in the Earth Tub? – The Earth Tub has been installed in some very cold locations. It may need supplemental heat if the temperature remains below 10F for more than 7 days. The aeration system should be shut down during cold weather.

Do I need two Earth Tubs to compost? - If you are composting less than 50 pounds of food per day, a single Earth Tub will provide continuous composting by adding food on one side and removing compost from the opposite side when the unit is full.

East Coast Office 51 Stimpson Hill Rd Box 560 Whitingham, VT 05361 Tel 800.610.7291 Fax 802.368.7313



West Coast Office 5350 McDonald Ave. Bainbridge Island, WA 98110

EARTH TUB™ DESCRIPTION OF OPERATIONS

Below is a summary of the 4 basic steps to the Operation of the Earth Tub.

- An organic "recipe" (i.e., a mixture of food waste and wood chips) is loaded into the Earth Tub™ through the loading hatch in the lid.
- The operator turns on the internal auger mixer, which thoroughly mixes and shreds the material as the operator rotates the lid.
- Once the active composting cycle is complete (approximately 3-4 weeks), the auger discharges the compost through a side door of the vessel. In order to remove all the compost, shoveling will be required.
- 4. This compost can be used directly as mulch or can be cured (stand in a pile) for 30 days before being used as a soil amendment. Screening will make the finished product even finer!

1. Food Scrap Loading - The first step is to make sure that the kitchen waste is collected for composting with as little contamination from plastics, etc. as possible. Hard foods such as pineapples, stale loaves of bread, etc., should be chopped up prior to disposing in the Earth Tub[™]. Because food scraps are wet, a dry bulking agent such as wood shavings must be added to create a balanced compost recipe.

2. Mixing and Shredding

Once the new material has been added, you are ready to begin mixing. The powered auger system has been designed to take the work out of turning over your compost pile. The mixing process is accomplished by slowly turning the powered auger/lid assembly in a counter-clockwise direction for one complete rotation, then moving the auger to the center and rotating clockwise. A complete mix should take approximately 10 minutes, and should be performed at least two times per week.

3. The Active Composting "Baking" Phase

Thermophilic composting at temperatures above 115 F occurs rapidly in the insulated Tub. The food waste becomes soft or "baked" at this temperature and is easily shredded by the notched auger. Continue adding material until the tub is full to the top of the auger screw. When the Earth Tub™ has been loaded to its capacity, no additional food waste should be added for approximately 14 days. During this time, the operator should mix the material at least once per week.

4. Unloading and Curing the Compost

Once the compost has finished active composting, it is ready to be unloaded. The Earth Tub^M should not be completely emptied, a small amount of compost remains and serves as a bulking agent and microbial starter for the next cycle. Here is a list of the steps for unloading the Earth Tub.

- Place a tarp or low wheelbarrow on the ground below the outside of the two discharge doors.
- Turn on the auger and push the compost out of the side doors. This will remove about ½ of the compost. Shoveling will be required to completely empty the Earth Tub.
- The compost could be used directly as thin mulch on the surface of the soil.
- To cure the compost, it should be placed outside in a pile for approximately 30 days.
- The compost can be screened to produce a finer compost product and remove any course-bulking agent.



Increase your TerraCycle[®] collections by hosting an e-waste collection drive. Inspire your community to donate used and old electronics to your collection drive instead of throwing them out.

HOSTING A DRIVE IS SIMPLE. FOLLOW THESE STEPS TO GET STARTED.

1. Join the E-Waste Brigade* program.

Did you know that we collect a lot of different types of e-waste? By joining this Brigade, you can earn TerraCycle points for everything from printer cartridges to cell phones.

2. Pick a location and date.

Determine a public location to host your drive. This could be a municipal building, a computer or electronic repair store, your office lobby, your school, or any other easily accessible public area. Then work with the establishment, if necessary, to determine when your drive, or drives, will take place.

3. Recruit volunteers from your community.

Make sure that at least one or two volunteers can lift over 15 lbs. and are willing to move around your boxes of e-waste collections.

4. Promote your drive.

Email your coworkers, put posters up in your school, and advertise in local publications. Remember, any TerraCycle points you earn through your e-waste drive can be donated to a school or charity of your choice, so be sure to let people know that their donations will help an organization in need! Use the following resources to help promote your drive in your local community.

E-Waste Drive Press Release: Adjust this template to fit your collection location and send it to your local paper.
 E-Waste Drive Poster: Complete this poster, make copies, and hang them up around your community.

5. Tell us how it went!

Post your pictures on TerraCycle's Facebook page, we'd love to see your successful collections!



Our community teamed up with TerraCycle[®] to outsmart e-waste. With TerraCycle, we now have the opportunity to recycle typically non-recyclable or difficult-to-recycle waste such as cell phones, inkjet cartridges, and graphing calculators, to name a few of the e-waste streams we collect. Instead of ending up in landfills, this e-waste is recycled and upcycled with TerraCycle.

WE WILL BE RECYCLING AT THE FOLLOWING DATE, TIME, AND LOCATION:

Date: ______
Time: ______
Location: _____

PLEASE BRING THE FOLLOWING TYPES OF E-WASTE:

ANY QUESTIONS? CONTACT _____ AT _____



(Insert College) is one of over 400 colleges competing this year from February 7 to April 2 to recycle the most and take the title.

Visit (Recycling Program URL) for more information



SPEAK OUT AND INTERACT RECYCLEMANIA.ORG 📑 📴 🚥

Letter of Support for Western State College of Colorado Environmentally and Socially Responsible Purchasing Plan

Attn: Sustainability Action Committee

The academic year 2010-2011 was celebrated at WSC as the Year of Sustainability. In the spring semester of 2011, the environmental studies capstone class, ENVS 400, identified multiple efforts on campus to address sustainability. Realizing the need to create a cohesive effort to move sustainability forward with concrete objectives to culminate the Year of Sustainability, the class collaborated with stakeholders across campus to draft a working sustainability plan: *Western State College: A Blueprint for Sustainability 2011-2020.*

The Blueprint is intended to stand as a living document, able to grow and adapt with the changing future circumstances. Future environmental studies capstone courses, as well as invested campus organizations and individuals, will continue to pursue the strategic actions outlined in the plan. This will move WSC toward greater sustainability and closer to the goals set forth in the Presidents' Climate Commitment and the Environmental Charter.

One such means of advancing Western's sustainability is by adopting a campus-wide Environmentally and Socially Responsible Purchasing Plan.

This will contribute to the goal of purchasing products based on their environmental standards from vendors certified through third-party organizations. The products purchased by WSC should embody the following principles:

- B> High content from post-consumer recycled materials
- Dow embodied energy (consumed to extract, manufacture, distribute and dispose)
- BO Recyclable, compostable and biodegradable
- စာ Non-toxic
- ℘ Energy efficient
- ∞ Durable and/or repairable
- 80 Produced in a manner that demonstrates environmental, social, and ethical values
- So Minimal packaging (packaging should also abide by the above principles)
- So Afterlife reuse/regeneration potential through the company (carpeting, furniture, etc.)

The signing of this document represents support of:

- 1) The Environmentally and Socially Responsible Purchasing Plan; and
- 2) The formation of a committee to oversee the implementation of the plan

Brooke Moran, Chair, Sustainability Action Committee

Date

REFUSE COLLECTION- Waste Management

COLLECTION SCHEDULE, LOCATIONS, NUMBERS, SIZES OF CONTAINERS

Location	No. of Containers	Size of Container	Pickups Per Week	Days of Pickup	Additional Pickups 1st 2 Weeks & Last Week Fall & Spring Semesters			
Aspinall	1	2 Yd	1	Friday				
College Center VIP	1*	6 Yd	1	Tuesday				
Dolores Hall	1	8 Yd	3	Mon, Weds, Fri	Additional lifts anticipated Priced per			
Field House	1	8 Yd	2	Monday, Friday				
Hurst Hall	1	6 Yd	1	Friday				
Library	1	8 Yd	3	Mon, Weds, Fri	Additional lifts			
Mears Hall	1	6 Yd	1	Friday	Additional lifts			
Pinnacles Apartments	1	8 Yd	3	Mon, Weds, Fri	Additional lifts anticipated. Priced per			
Quigley Hall	1	6 Yd	1	Friday				
Robidoux Hall	1	8 Yd	3	Mon, Weds, Fri	Additional lifts			
Taylor Hall	1	6 Yd	1	Friday				
Whipp Maintenance Building	1	6 Yd	1	Friday				
TOTALS	12							
		On Ca	II Service	•				
Boneyard	1	30 Yd	On Call					
	Temporary F	Poll-Offe Twice I	Dor Voar (9	Spring and Fal	l Clean)			
Mears Complex	3	30 Yd.	1	As Needed	x 2 Spring (May, 30 Yd.), x1 Christmas			
Pinnacles Apartments	3	15 Yd./30 Yd.	1	As Needed	x 2 Spring (30 Yd.),			
Library Parking Lot	1	30 Yd.	1	As Needed				
Dolores	1	15 Yd.	1	As Needed	x 1 Christmas			
Chipeta Hall	1	30 Yd.	1	As Needed	x 1 May			
Whip	N/A	Sharps Container	1	N/A	X1 December			

Documented Quote/Request For Proposals (RFP) Solicitation/Bid No.: <u>RFP-16-78</u> Waste Removal Service

Vendor Response Form

Provide firm price quotations for refuse collection and removal in the following form:

Item	Description of Services		Amount
<u>#</u>			
1.	Year 1: State the monthly rate from July 1,		\$3,048.33
	2015 through June 30, 2016 to provide service		
	levels described in Exhibit A. Include pricing for		
	rental and collection from ongoing containers		
	only. Not for anticipated additional collection.		
2.	On Call Services: State the amount for on-call		
	services by type:		
	a. 6 Yd Container. (Additional dump of existing		
	container).		
		Additional Lift	\$126.00
	b. 8 Yd Container. (Additional dump of existing		
	container).		
		Additional Lift	\$169.000
	c. 15 Yd Container.		
		Deliver / Remove	\$100/0.00
		Rent per week	\$0.00
		Dump Container	\$565.00
	d. 30 Yd Container.		
		Deliver / Remove	\$100.00
		Rent per week	\$0.00
		Dump Container	\$725.00
	Temporary Roll-Offs Twice per Year (Spring		
	and Fall Clean). State the amount for temporary		
	roll-offs. The amount should indicate the cost of		
	delivering and removing the additional roll-offs,		

Item	Description of Services		Amount
<u>#</u>			
	rental per week and cost of collection and		
	disposal per emptying of each container:		
3.	a. Mears Complex (3 x 30 Y d)		¢100/0.00 20
		Deliver / Remove	\$100/0.00 per 30 Yd
		Rent per Week	\$0.00
		Dump Container	\$725.00 per 30 Yd
	b. Pinnacles Apartments (2 x 30 Yd)		
	(1 x 15Yd)		
		Deliver / Remove	\$100/0.00 per 30 Yd.
		Rent per Week	\$0.00
		Dump Container	\$725.00 per 30 Yd.
		Deliver / Remove	\$100/0.00 per 15 Yd.
		Rent per Week	0.00
		Dump Container	\$565.00 per 15 Yd.
	c. Library Parking Lot (1 x 30 Yd)		
		Deliver / Remove	\$100.00
		Rent per Week	\$0.00
		Dump Container	\$725.00
	d. Delores (1 x 15 Yd)	Deliver / Remove	\$100.00/0.00
		Rent per Week	\$0.00
		Dump Container	\$565.00
	e. Chipeta Hall (1 x 30 Yd)	Deliver / Remove	\$100.00
		Rent per Week	\$0.00
		Dump Container	\$725.00
	f. Whip (1 x Sharps Container & Medical Waste)		\$130.00

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