UW Recycling
Our University. Our Planet.

UW RECYCLING ANNUAL REPORT 2018

BUILDING SERVICES DEPARTMENT

UNIVERSITY of WASHINGTON

UW RECYCLING

FISCAL YEAR 2018 ANNUAL REPORT

BUILDING SERVICES DEPARTMENT

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UW RECYCLING MISSION STATEMENT

UW Recycling provides innovative recycling, composting and waste reduction solutions with unmatched passion for the health of our campus and our planet.

PROGRAM OVERVIEW

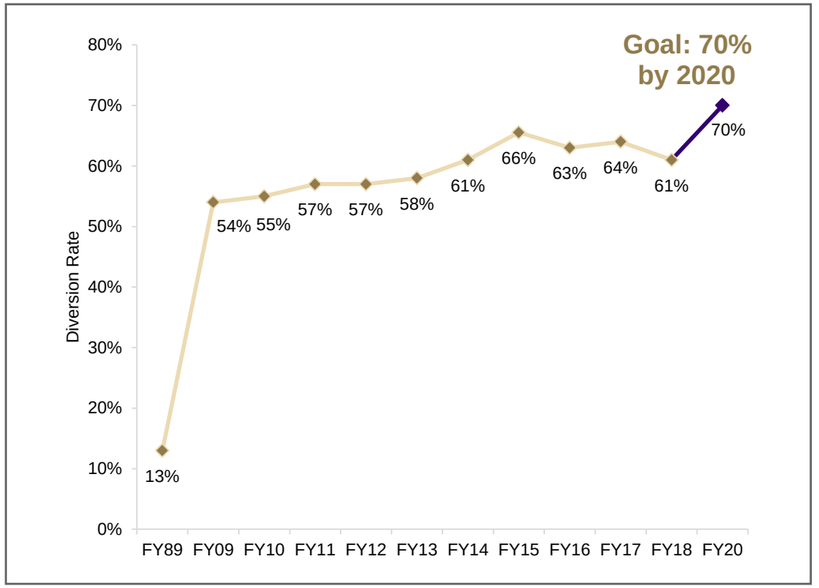
KEY POINTS

- 61% diversion rate
- Saved more than $1.2 million by recycling, composting and reuse
- Net reduction of 10,159 tons of greenhouse gas emissions

INTRODUCTION

The Fiscal Year 2018 UW Recycling Annual Report provides an overview of the University of Washington's campus recycling and solid waste program in Seattle from July 1, 2017, through June 30, 2018.

DIVERSION RATE GOAL



FISCAL YEAR (FY) 2018 ACCOMPLISHMENTS

Each year, UW Recycling monitors its program's success and develops new initiatives to help drive waste diversion efforts. This year UW Recycling continued to raise overall awareness about the waste diversion goal of 70% by 2020. Specific educational and infrastructural accomplishments for fiscal year 2018 include:

- Implemented the MiniMax waste diversion program in 31 buildings (15 wings of the Magnuson Health Sciences Building and 16 additional buildings on campus in Seattle).
- Diverted over 39 tons of donated material and recycling through SCRAM, our student moveout program.
- Planned and completed the 2018 Waste Characterization Study; began evaluation of current diversion programs.
- Piloted six recycling bag distribution stations located in parking lots and available for football tailgaters to use during each home game.
- Contributed waste diversion data that helped name University of Washington on The Princeton Review's Green Honor Roll for the seventh consecutive year.
- Conducted recycling outreach and education to staff, faculty, students and visitors through departmental presentations, tabling events (i.e., Dawg Daze, Sustainability Festival, America Recycles Day), and the engagement of student groups in events including EcoReps during RecycleMania and SAGE during football bluebag distribution.
- UW Recycling and our vendors collected 15.8 tons of material at Husky Neighborhood Cleanup, preventing illegal dumping and increasing safety for students residing in the area north of campus.
- Collaborated with the Custodial Services' Participatory Ergonomics Team to review and approve new public area bin design options for renovated and new construction areas.

DIVERSION RATE: 61%

The diversion rate is an indicator of how successful the University of Washington is in keeping materials out of the landfill. It is used to measure how the institution is doing compared to previous years, other higher education institutions, and the City of Seattle. The diversion rate is calculated by dividing the total tons of material diverted from the landfill by the total tons of waste generated by the UW's campus in Seattle.

RATE CALCULATION

The diversion rate for fiscal year 2018 was 61%, down from 64% in fiscal year 2017. The total amount of material recycled decreased by 545 tons and the total amount of material landfilled increased by 198 tons, which resulted in the diversion rate decrease.

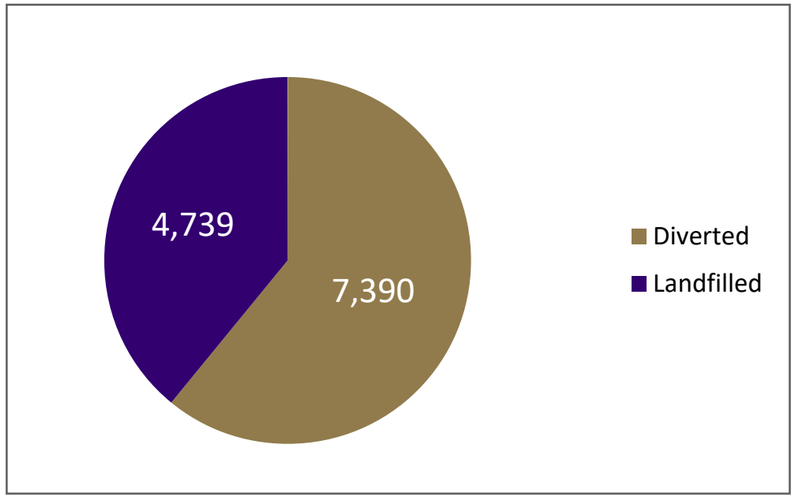
Note that the tonnage for both recycled and landfilled special wastes are included when calculating the diversion rate, but those materials are excluded when calculating the net avoided disposal cost. Spent light bulbs (fluorescent lamps), white goods (refrigerators), and electronics (CPUs/monitors) are considered recycled special waste because these items contain potentially toxic substances (such as mercury, refrigerants and lead), and therefore banned by law from disposal in the landfill. Sharps and untreated biomedical waste are considered landfilled special waste and disposed of off-site, separate from the municipal solid waste stream.

ENSURING ACCURACY

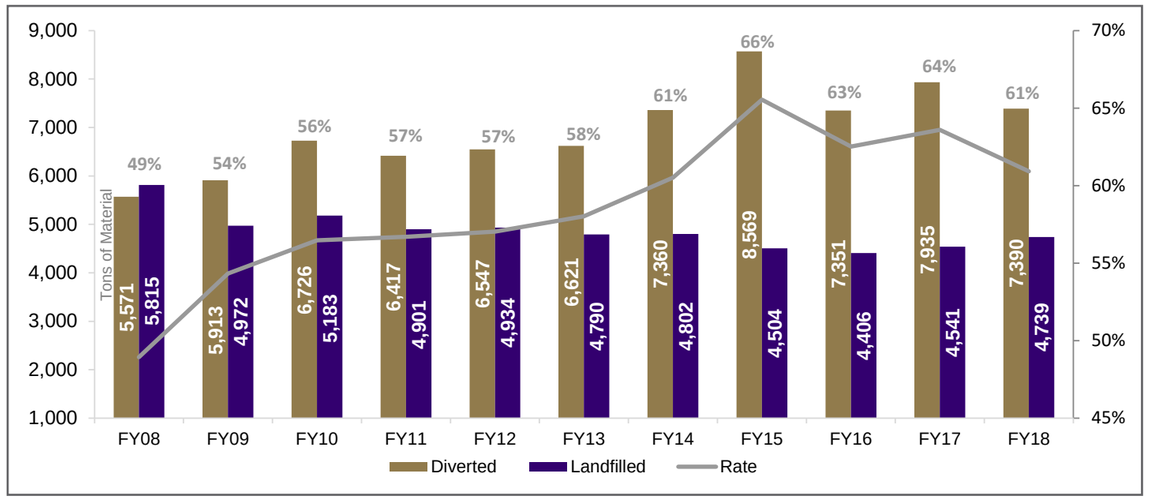
Committed to data integrity, UW Recycling took the initiative to conduct a route audit with its food waste collection vendor, Cedar Grove, in order to determine updated weight estimates for compostable materials being collected from campus. As a result of the adjustment, the waste diversion for the following fiscal years are lower than the reported fiscal year 2015 numbers.

UW Recycling monitors the waste diversion numbers each quarter and tries to identify trends or causes for any fluctuations. The department also develops annual program plans centered on increasing waste diversion. For fiscal year 2018, the focus was on continued educational outreach and waste collection infrastructure improvements throughout campus — as well as the implementation of waste diversion programs such as MiniMax, increased public area composting, and restroom paper towel composting.

2018 DIVERTED TONNAGE VERSUS LANDFILL TONNAGE



FISCAL YEAR PROGRESSION OF DIVERTED TONNAGE VERSUS LANDFILL TONNAGE



NET AVOIDED DISPOSAL COST

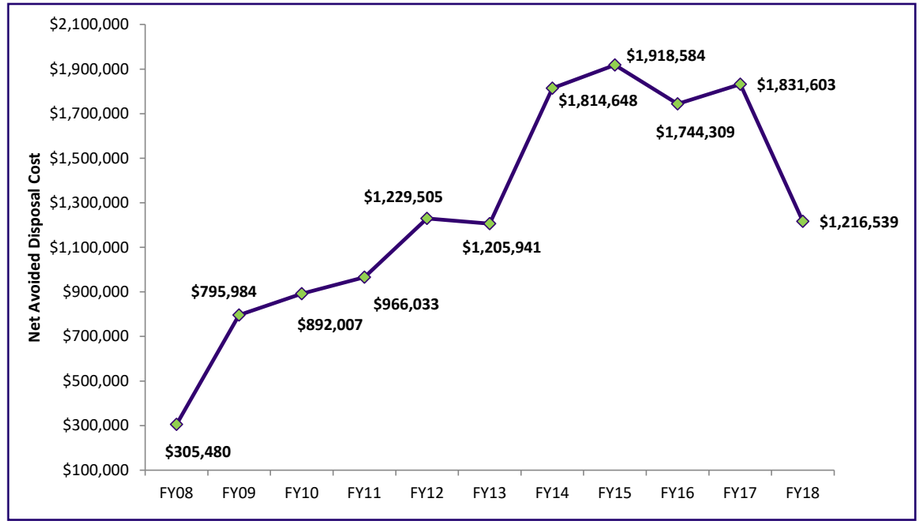
Net avoided disposal cost is a calculation that shows the benefits of UW Recycling's program and whether it makes good economic sense to recycle. The net avoided disposal cost is calculated by looking at two things: the cost to landfill materials versus recycle material and the overall program and operation costs to run the recycling and solid waste program.

Note that recycled and landfilled special wastes are not included when calculating the net avoided disposal cost. Recycled special waste cannot be landfilled and does not contribute to the savings achieved through recycling and its inclusion in the net avoided disposal cost would significantly increase the average cost per ton to recycle — thereby misrepresenting the overall average cost per ton to recycle. Recycled special waste includes electronics, fluorescent bulbs and electronic media.

Landfilled special waste is not included when calculating the net avoided disposal cost because the high costs associated with its disposal would skew the average cost per ton to landfill. Landfilled special waste includes biowaste and sharps.

Once the figures are calculated, we subtract the average cost per ton to recycle from the average cost per ton to landfill, and multiply the difference by the total tons recycled. A positive net avoided disposal cost demonstrates that it costs less to recycle than to landfill waste. The FY 2018 net avoided disposal cost was $1,216,539.

NET AVOIDED DISPOSAL COST



CARBON FOOTPRINT

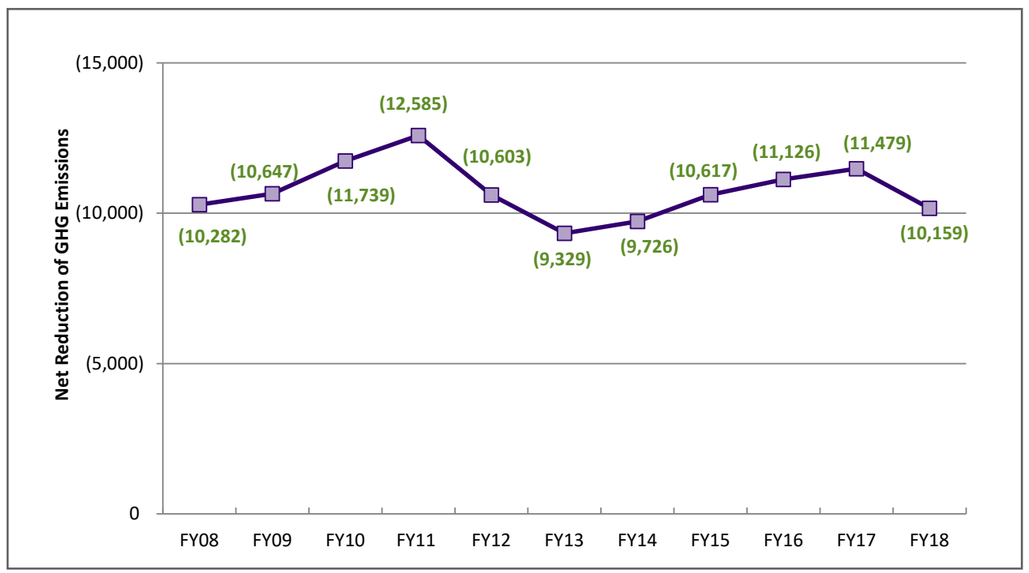
The collection of solid waste produces greenhouse gas emissions in three primary ways:

- Disposal: The anaerobic decomposition of waste in landfills produces methane, a greenhouse gas 21 times more potent than carbon dioxide.
- Transportation: Shipment of waste to disposal sites produces greenhouse gas emissions from the combustion of the fuel used in transport.
- Manufacturing: Fossil fuels are used to obtain raw materials and manufacture new items, a process which produces greenhouse gases.

Estimating Greenhouse Gas Emissions

The US Environmental Protection Agency (EPA) Waste Reduction Model (WARM) is designed to estimate greenhouse gas (GHG) emissions and reductions associated with various waste management strategies. By calculating emissions in metric tons of carbon dioxide equivalent ($MTCO_2E$), the model divides waste into multiple categories depending on waste type and allows the user to designate landfill, incineration, recycling, or composting as the method of disposal. The chart below shows greenhouse gas (GHG) emission reductions over the past 10 years. The numbers in parentheses represent the net reduction of GHG emissions as a result of the University's recycling and composting programs.

TREND IN UNIVERSITY GREENHOUSE GAS REDUCTIONS



UW Recycling's Carbon Footprint

A carbon footprint is defined as the total set of GHG emissions caused directly and indirectly by an individual, organization, event or product. By diverting 61% of the waste generated in FY 2018, the University's recycling and solid waste programs had a net reduction of greenhouse gas emissions of 10,159 $MTCO_2E$. The WARM tool (version 11) reports net emissions only from the mixed municipal solid waste category, while recycling and composting are considered less GHG intensive. The results of the WARM calculations are in the chart below.

WARM Calculations

MATERIALS	TONS	$MTCO_2E$
Mixed Municipal Solid Waste	4,739	0
Food Scraps	1,675	(1,002)
Yard Trimmings	429	24
Cardboard	293	(707)
Concrete	231	(36)
Dimensional Lumber	175	(247)
Leaves	65	29
Mixed Metals	384	(2,104)
Mixed Paper	640	(1,847)
Mixed Recyclables	1,765	(4,057)
Personal Computers	87	(204)
Tires	13	(6)
FY 18 TOTAL	**10,496***	**(10,159)**

What Do These Numbers Mean?

The recycling efforts at the University of Washington have a positive effect on our environment and our community. In fiscal year 2018, the University's recycling and solid waste programs:

- Conserved energy equivalent to 749 American households' annual energy consumption.
- Reduced energy consumption equivalent to 646,484 gallons of gasoline.
- Reduced pollution equivalent to taking 1,861 cars off the road for a full year, or 53 railway cars full of coal.

**The total tons listed in version 11 of the WARM tool calculation are lower than total tons of material generated during fiscal year 2018 due to the limited materials recognized by the WARM model.*

WASTE STREAMS

DIVERTED RECYCLED WASTE STREAMS

Recycled materials accounted for 61% (7,390 tons) of the total materials disposed of in FY 2018. On campus, recycled materials are consolidated into combined material streams that mirror industry standards and are categorized as follows:

Combined Fiber:

Combined fiber is cardboard, mixed paper, and combined paper/cardboard. This does not include fiber tonnage that is recycled through single-stream receptacles, which is captured in the mixed recyclables stream.

Food Waste:

Food waste includes any food, compostable paper, and compostable packaging and serviceware.

Wood and Landscape Waste

Wood/landscape waste includes untreated and unpainted wood and pallets, as well as landscape debris.

Construction Waste

Construction waste includes mixed construction and demolition (C&D) materials, concrete, asphalt and metal. Mixed C&D includes treated or painted wood, metal, carpet and concrete/asphalt when those items cannot be separated out from the rest of the material. When possible, concrete, asphalt and metal are each collected separately for recycling.

Mixed Recyclables:

Mixed recyclables are collected in mixed containers bins or single-stream containers. Mixed containers includes all container-type materials that are accepted by our recycling vendor, such as bottles, cans, cups, jars, cartons, jugs, plastic film and aseptic packaging. Single-stream combines both mixed containers and paper.

Recycled Special Waste

Materials that are banned by law from landfill disposal due to their potentially toxic properties, or materials that must be recycled separately, including:

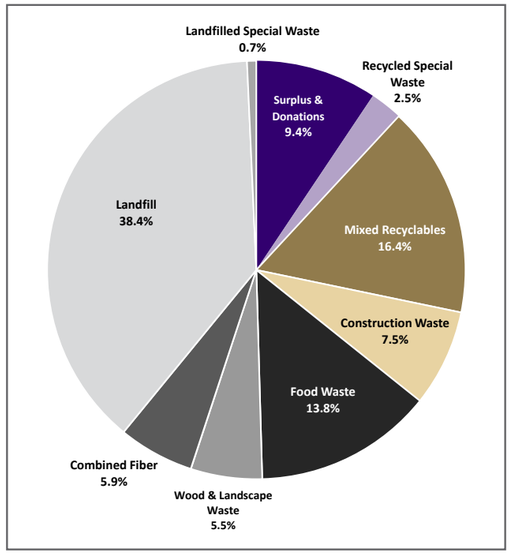
- Batteries, electronic media (disks), and electronics (cell phones, computers and televisions)
- Fluorescent lighting, lead, mercury and refrigerants
- Printer/copier cartridges and components
- Styrofoam, mattresses, textiles and tires
- Used cooking oil collected from campus dining facilities
- White goods (freezers, refrigerators, watercoolers, etc.)

Surplus and Donations

Resold items and donations are included in our waste diversion because the University of Washington measures its sustainability performance by using the Sustainability Tracking, Assessment & Rating System™ (STARS®), which includes reselling as a criterion for waste diversion.

All items purchased with University funds or given to the University that are no longer needed by a department—whether they are in working or non-working condition—must be transferred to UW Surplus for recycling, resale or disposal. Tonnage for resold items, donations collected from SCRAM (our student move-out program) and food donations collected from UW Housing & Food Services cafés and dining locations are captured in the surplus and donations stream. However, tonnage for all surplus items that are recycled is captured in the construction waste stream.

2018 OVERALL WASTE STREAMS



LANDFILLED WASTE STREAMS

Landfilled materials collected on campus accounted for 39% (4,739 tons) of the total materials disposed of in FY 2018. The materials are defined in the following categories:

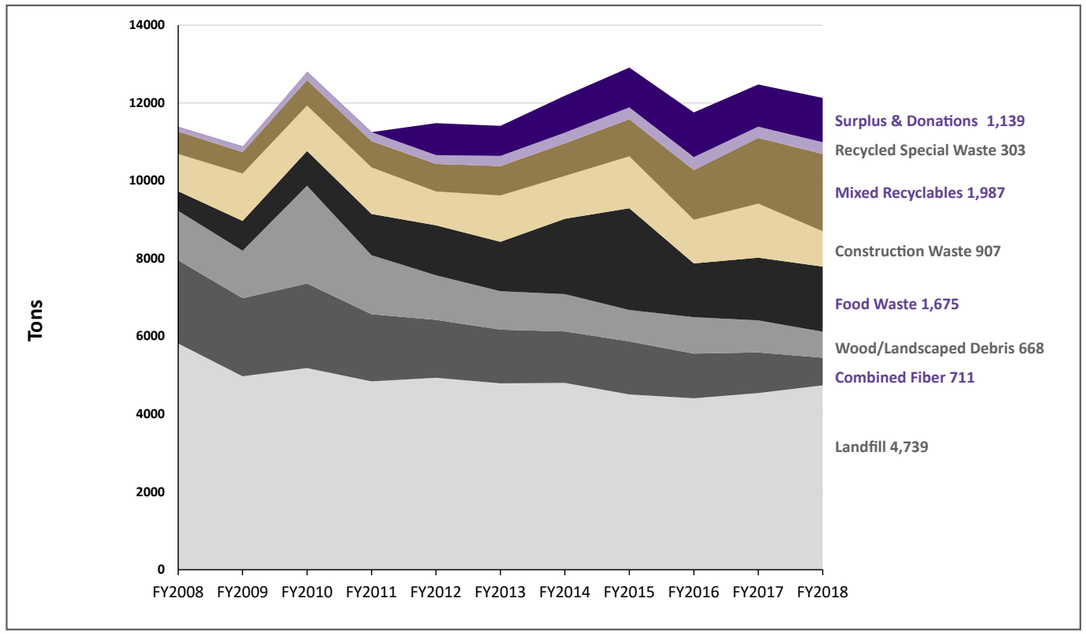
Solid Waste:

Solid waste includes all materials that cannot be recycled through one of the above listed streams or is placed in containers labeled as 'trash' or 'landfill.' These materials are sent to the landfill for disposal. According to the 2018 Waste Characterization study, 62% of material sent to the landfill as solid waste is recyclable or compostable.

Landfilled Special Waste:

Landfilled special waste is regulated by state law and must not be disposed of in the regular waste stream. This category includes biowaste and sharps waste. Biowaste is material that may be contaminated with biohazardous material (including recombinant or synthetic DNA/RNA) and is hauled by a UW contracted vendor that treats the material prior to disposal. Sharps refers to instruments used to puncture or perform incisions which in turn can injure waste handlers if disposed of in a regular waste container.

HISTORICAL TREND OF WASTE STREAMS



The graph above shows the historical trend of various material streams and how they impact our overall waste diversion. As expected, food waste and organics have been driving our success.

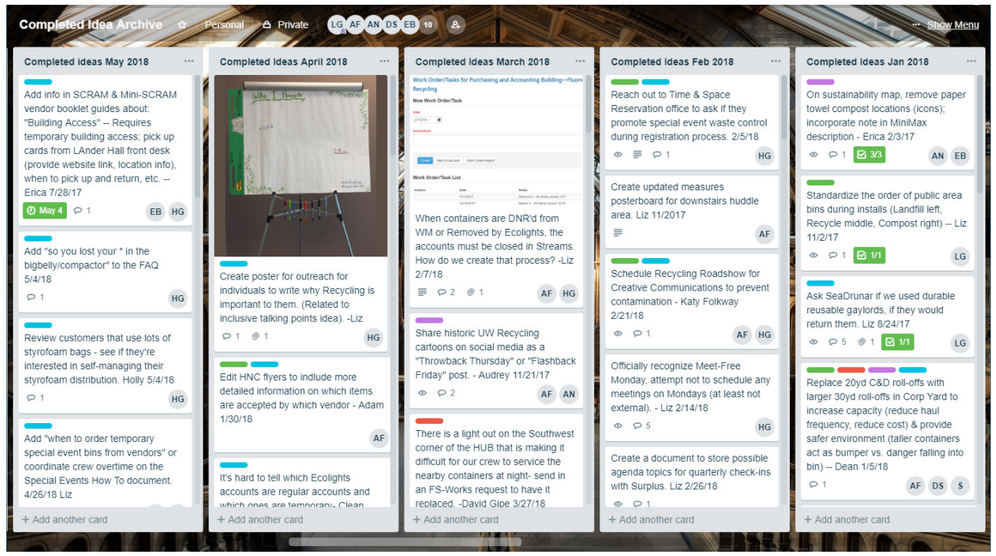
HIGHLIGHT: LEAN SYSTEM & PROCESSES

In accordance with UW Facilities, the UW Recycling team incorporates Lean continuous process improvement in its operations. This ongoing review process is designed to improve business over time.

The administrative group meets with the operational team of drivers and crew for what is known as a huddle every afternoon. These daily huddle meetings encourage engaged communication and improved idea generation. The team discusses safety, operations, waste contamination, and any work orders that require follow up with customers. Any issues are documented for immediate follow up and any ideas for ways to improve how the team services the campus community are saved in Trello, an online idea tracking system (see screen shot below).

Ideas are assigned a team and categorized under safety, waste diversion and customer service so the team can easily reference and update in order to keep ideas moving towards implementation.

Every Friday, the administrative team and the operational leaders meet to review and strategize how to complete generated ideas. The Lean system helps the team improve programs, operations and processes to effectively and efficiently reach goals, and fosters and environment in which all voices and contributions are recognized. During FY 2018, UW Recycling generated an average of 23 new process improvement ideas and implemented 21 ideas every month.



The MiniMax team delivers bins to the AA Wing at the Magnuson Health Sciences Center.

HIGHLIGHT: MINIMAX EXPANSION IN HEALTH SCIENCES BUILDING

Following a mandate from UW senior leadership to expand the MiniMax waste diversion program to all academic and facility buildings on campus, UW Recycling began the year focused on expanding the team, investing in inventory and designing a strategy to convert 58 buildings by the close of 2018 calendar year. The strategy plan outlined four significant milestones to meet along the way to ensure the project remained on track—the first being the Health Sciences Building. With a dedicated project team of three (one part-time student assistant, one part-time program assistant, and one full-time program assistant), the first project milestone was successfully completed in FY 2018. This accomplishment translates to:

- 1,500 fewer plastic bag liners discarded daily
- 25 custodial hours/per day redirected to essential cleaning tasks
- 25% reduction in garbage generated from the building per month compared to last year
- 68 fewer tons of garbage sent to the landfill during the first 6 months after implementation
- 108 public area compost bins and 108 recycling bins in hallways
- 200 compost bins in kitchens and other eating areas
- 474 recycling bins in office suites, conference rooms and other common areas
- 202 Health Sciences Building restrooms converted to paper towel composting

Additional support came in the form of campus partners' professional expertise. In the case of preparing and renovating public area bins, UW Recycling turned to UW Facilities Maintenance & Construction for their assistance. UW Recycling also partnered with UW Surplus and UW Moving to transport bins to installation sites. BSD's Custodial Services and UW Recycling operations crew and program coordinators contributed during installs with preparing, lining and placing bins.

In order to effectively explain the MiniMax expansion to faculty and staff, UW Recycling created a MiniMax information webpage along with a list of answers to frequently asked questions. A blog article was also distributed to campus through UW Today and the UW Insider. Prior to installs, UW Recycling staff coordinated two in-person information sessions in the Health Sciences Building, in collaboration with EcoReps' Greening Health Sciences Initiative as tabling events. UW Recycling staff also provided individual on-site education to building occupants while exchanging desk-side garbage bins with self-service MiniMax containers.

The remaining UW academic and facilities buildings are scheduled to be completed by the end of December 2018.

UW Recycling and Cascadia Consulting staff work together to sort materials for the study.

HIGHLIGHT: WASTE CHARACTERIZATION STUDY

Every 15 years, UW Recycling commissions a waste characterization study through Cascadia Consulting Group. The purpose of the study is to analyze the composition of the garbage produced at the University of Washington in Seattle — as well as how accurately the UW community sorts garbage, recycling and compost in bins across campus.

The 2018 study follows the same process as previous studies conducted in 1989 and 2003, but with an expansion in scope that now includes materials collected through recycling and compost streams. From January 29 through February 16, 2018, UW Recycling and Cascadia collected randomized samples and sorted over 38 tons of material.

Planning for the 2018 study took place from November 2017 through January 2018. Along with finalizing details like project scope, budget and updates, UW Recycling took on the challenge of updating the study's criteria. Results from this study are helping UW Recycling better serve campus with current diversion programs, identify realistic and achievable program goals, and supporting the design of effective diversion programs to achieve specific goals. The expanded scope allows UW Recycling to learn the capture rates of recyclable or compostable materials. For example, say campus discards a total of 12 pizza boxes a year. Because of the study, UW Recycling can now plainly see that seven of them end up in the garbage and the remaining five are composted correctly.

The major takeaways of the study include:

- Compostable and food-soiled paper, like pizza boxes and napkins, are the top opportunity to reduce UW's landfilled material and reduce the recycling contamination rate
- Similarly, food is the top contaminant in the recycling
- Five times more low-grade recyclable paper (like junk mail) ends up in the garbage than in the recycling
- Over the last 15 years, food waste sent to the landfill has been reduced by 75%

To better illustrate the study's findings in an impactful way, UW Recycling turned to UW Lecturer and UW Sustainability Renewable Energy Liaison Marilyn Ostergren for her expertise in creating infographics. UW Recycling plans to share the infographics as a means to educate both the campus and the public about waste behaviors.

UW Recycling staff sort item donations from residence halls during SCRAM.

COLLECTION SERVICES

Two types of collection services are provided at the University of Washington: self-haul and vendor provided. The type of service provided depends on the amount and material generated.

Self-Haul Service

UW Recycling crew collect recyclables (cans, bottles and paper) and waste in University-owned collection vehicles from the loading docks of most central campus buildings that accommodate toters or 2-yard dumpsters. The materials are transferred to designated recycling collection and waste disposal sites in Seattle.

UW Recycling crew also collect auxiliary recyclables or recyclable materials (i.e., Styrofoam, toner cartridges, electronic media, pallets, scrap metal) that can be diverted from the waste stream, but cannot be comingled with the standard recycling containers found in campus buildings or at the loading docks.

All materials are collected by a box truck or pickup truck from building loading docks and consolidated in larger roll off containers for collection by multiple vendors. This important service is integral to our overall waste diversion planning and it ensures recyclable material doesn't end up in a landfill.

Vendor-Provided Service

All other service on campus is provided by vendors. Contracted vendors provide service for waste and recycling, organics, combined fiber, electronics, appliances and fluorescent lighting. Non-contracted vendors provide service for electronic media and small personal electronics, printer/copier cartridges and components, and Styrofoam.

Cedar Grove

Provides collection and composting of organics including food waste, compostable serviceware, clean wood/pallets and landscape debris. The contract with Cedar Grove began in January 2009 for a term of six and a half years, with renewable extensions of two years (for up to a total of six years).

EcoLights

The vendor used by Washington state that provides collection and recycling of fluorescent lighting. UW Recycling has been included on the state's fluorescent lighting contract since FY 2010.

Electronics Recyclers International
Provides collection and recycling of electronics, computers, monitors and peripherals.

Greendisk
Provides collection and recycling of non-confidential electronic media, including CDs, DVDs, videotapes, small personal electronics, and electronic accessories (such as power cords, hard drives and chargers).

Cartridge Recycle Center
Provides collection and recycling of printer/copier cartridges and components, fuser drums, imaging units and transfer rollers.

Styro Recycle
Provides collection, processing, and recycling of Styrofoam packing peanuts, polystyrene blocks and boxes, and PDPE #4 foam.

Total Reclaim
Provides collection and recycling of appliances, including refrigerant gases and white goods; designated vendor used by Washington state.

Waste Management (WM)
Provides collection and disposal of municipal solid waste and treated biomedical waste, hauling and disposal of treated sharps, and collection and processing of recyclables. WM collects from buildings and facilities that generate large volumes of waste and/or recyclables, including residence halls and dining facilities, Magnuson Health Sciences Center, Facilities Maintenance & Construction trade shops, and campus industrial yards.

Waste Management also provides service during special cleanout or renovation projects, for large-scale special events including Husky Football, and when a location requires regular weekend service, such as the University of Washington Medical Center. The contract with WM began in January 2009 for a term of six and a half years, with renewable extensions of two years (for up to a total of six years).

Temporary recycling, compost and landfill bins sit near the Husky Stadium during a football game.

PROGRAM COSTS & OPERATIONS

The success of the UW Recycling program is due primarily to the financial commitment of the UW by providing funding for: hiring and maintaining appropriate staffing levels; leasing and operating collection vehicles; purchasing equipment and supplies; and investing in improved infrastructure so waste, recycling, and compost collection containers are purchased and placed in the most effective locations.

FY 18 EXPENDITURES

Salaries	$620,777
Benefits	$231,627
Vehicles/Fuel	$121,604
Disposal via Seattle Public Utilities	$337,443
Other	$32,333
Supplies	$17,676
Equipment	$149,620
Electronics Recyclers International	$40,423
Waste Management	$1,207,693
Styro Recycle	$2,550
Total Reclaim	$28,630
EcoLights	$27,082
Greendisk	$4,932
Cedar Grove	$502,005
Cascadia Consulting	$168,539
Recharged disposal to self-sustaining units*	($1,438,512)
Total Expenditures:	**$2,054,420**

FY 18 REVENUE

Paper/Cardboard Recycling	($10,455)
Metal Recycling	($21,580)
Toner Cartridge Recycling	($2,892)
Recharged Work Orders**	($144,190)
Total Revenue	**($179,117)**
FY 2018 Total Budget*	**$1,875,303**

*UW Recycling pays for disposal for the entire University, including departments that have self-sustaining budgets that bear their portion of costs. UW Recycling recovers the costs for self-sustaining departments by recharging these costs back to the departments. In FY 2018, total recharges to self-sustaining university departments for waste, recycling, and compost collection. **UW Recycling charges hourly rates for the operations team to provide services such as special event waste container rental, delivery, set up and collection.

UW RECYCLING OPERATIONS

FY 18 STAFF

16 Staff Members (15 FTE)

ADMINISTRATION

Administrative Manager (1 FTE)
Program Support Supervisor II (1 FTE)
Program Coordinators (2 FTE)*
Communications Specialist (1 FTE)
Program Assistant (1.5 FTE)
Student Assistant (.5 FTE)

OPERATIONS

Program Operations Manager (1 FTE)
Truck Lead (1 FTE)
Waste Collectors (3 FTE)
Litter Collectors (2 FTE)

WAREHOUSE

Driver/Warehouse Worker (1 FTE)

VEHICLES

Rear-load waste & recycling compaction vehicles (3)
Box truck (1)
Utility pickup trucks (3)

*One program coordinator is shared with our sister operational unit, Custodial Services, within Building Services Department.

LOOKING AHEAD: FISCAL YEAR 2019 PRIORITIES

In 2019, our efforts will continue to focus on minimizing the amount of food waste and recycling that is still discarded in the landfill, and reduce overall contamination among all waste streams. We hope to do so through consistent educational outreach, infrastructural improvements and innovative programming.

Educational Outreach

- Promote "Recycling Roadshow" and "Trash Talk" presentations to faculty, staff and student groups, including leading student classes and becoming a resource for UW New Employee Orientation and First Year Programs.
- Continue to foster the development of the student-driven RecycleMania planning committee to increase campus wide promotion of and participation in the national recycling competition. We want to maintain our lead with Pac-12 schools in overall recycling and increase our ranking among Universities nationwide. The campaign, which lasts eight weeks, will focus on 4 messages: "Clean, Empty, Dry," "Recycle Right," "Reduce Reuse," and "Buy Recycled." The team hopes to prevent liquids and food from contaminating the recycling stream and reduce waste.
- Update educational materials and signage on recycling and compost receptacles in highly visible locations, including in dining facilities, residence halls, academic building hallways, and on outdoor Bigbelly containers.
- Advertise compostable paper and food composting in public spaces and residence halls.

Infrastructural Improvements

- Implement the MiniMax program in the remaining 29 academic and facilities buildings on campus to reach 100% participation, as outlined in the MiniMax Strategy Plan.

Innovative Programming

- Pilot liquid collection containers next to recycling bins to prevent contamination in the recycle stream, reduce and improve custodial ergonomic safety.

- Coordinate a "Trash-In" event in a highly visible location on campus—inviting students, staff and other members of the UW community to gather and sort trash collected from campus buildings— to raise recycling awareness and education.

- Promote MiniMax in self-sustaining campus groups not currently participating in the program, including UW Medical Center and Intercollegiate Athletics, to increase waste diversion and disposal cost savings.

Photo: Jayne Milton

THANK YOU

UW Recycling thanks the University's students, faculty, staff and community partners for their commitment to the environment, willingness to recycle, and overall support of the program. It is through everyone's collective efforts that the University of Washington has achieved such great success in sustainability.

BUILDING SERVICES DEPARTMENT
Gene Woodard, Director

UW RECYCLING ADMINISTRATIVE STAFF
Liz Gignilliat, Administrative Manager
Allison Nitch, Communications Specialist
Erica Bartlett, Program Support Supervisor
Adam Fehn, Program Coordinator
Holly Griffith, Program Coordinator
Audrey Taber, Student Assistant
Kevin Terrado, Program Assistant
Todd Carey, Program Assistant

UW RECYCLING OPERATIONAL STAFF
Dean Seaman, Program Operations Manager
David Speed, Truck Lead
Ed Lyle, Waste Collector
Chris Forbes, Waste Collector
Vinnie Yok, Waste Collector
David Gipe, Litter Collector
Don Sutherland, Litter Collector
Phong Pham, Driver/Warehouse Worker

PREPARED BY
UW Recycling, 3900 Seventh Avenue NE, Third Floor, Seattle, WA 98195
(206) 685-2811 / www.uwrecycling.com / recycle@uw.edu

COVER PHOTO CREDIT
Dennis Wise

STATISTICS
Liz Gignilliat

LAYOUT
Allison Nitch

EDITORS
Liz Gignilliat, Holly Griffith & Allison Nitch