

University of Saskatchewan

# 2019 Waste Audit Report

# Executive Summary

The University of Saskatchewan Office of Sustainability (USOS) conducted a solid waste audit from January 21-25, 2019 for the following campus buildings:

- Geology
- Education
- Murray Library
- Place Riel
- Marquis Hall
- Agriculture
- Louis Pub
- Health Science

Each morning, Loraas landfill bins were picked up from the building loading docks and waste was sorted by hand by USOS staff and volunteers. After early analysis, Marquis Hall and Health Science were eliminated from the list of buildings to audit due to the scale and nature of their waste; they will be revisited separately in a future audit.

Following the audit and analysis of the data collected, 3 main recommendations were made:

1. Improve the university's organics diversion programs,
2. Continue and improve training and education of custodial employees and begin targeted educational campaigns addressing Styrofoam and disposable coffee cup waste, and
3. Continue to purchase and distribute colour-coded waste receptacles with signage consistent with existing campus messaging.



Odili Obi  
Waste Prevention Co-ordinator



# Introduction

USOS conducted a solid, non-hazardous waste audit for selected buildings at the University of Saskatchewan Saskatoon campus. A post-consumer point of collection waste audit was performed for the selected buildings over the course of five (5) days: January 21-25, 2019. The overall purpose of the waste audit is to:

- Identify the quantity and composition of materials generated for landfill disposal in the selected buildings;
- Determine the quantity of compostable or recyclable materials that are improperly landfilled;
- Analyze the variety of materials produced for each selected building; and
- Explore opportunities and required processes to implement an organics program at the University of Saskatchewan.

The Waste audit will also be used to determine:

- The university's ability to reduce, reuse, and recycle materials from the existing waste stream;
- The overall diversion progress for all recyclable materials;
- What further opportunities exist for greater waste diversion; and
- Ways to enhance and strengthen the existing waste diversion and reduction initiatives currently in place.

The University of Saskatchewan presently only maintains two waste streams: recycling and landfill waste, the latter of which was the focus of this audit. This analysis will help to identify what is being incorrectly wasted (i.e. recycling in the landfill stream) and open up new opportunities to increase total diversion through the development of an organics stream.

## Waste Audit Procedure

To collect an appropriate sample of materials for the audit, six(6)-yard landfill bins were picked up daily from the selected campus buildings (Place Riel, Louis, Murray Library, Geology Building, Education Building, Agriculture Building, Marquis Hall, and Health Science) loading dock area. These buildings were selected based on the amount of human traffic, food service outlets and office space waste generation.

Every morning after custodial staff had collected waste material from the designated buildings and deposited it in the landfill bin in the loading dock area, the bins were picked up by Loraas truck drivers and emptied at the onsite audit sorting area under the specified label for each designated building. The USOS team, along with student/staff volunteers, collected the waste samples and conducted the audit and analysis of the waste stream from each building. Marquis Hall and Health Science buildings were eliminated from the audit after the first day after it was determined that the scale and nature of the waste from these buildings would not allow a successful completion of the week's audit. These two buildings will be revisited in the future for their own waste audits.

The auditing team completed an overall survey over the course of five (5) days; bags of waste material were opened and separated into waste stream type (waste, organic and recycling). Subcategories were identified for Styrofoam and disposable coffee cups to address the disproportional amount of waste they represented compared to other individual materials. Each waste stream type and sub-category were weighed individually, and photographs were taken to document the audit.

*A small sample of waste collected prior to sorting.*



# Category Sorted

The following is a subdivided list of each waste stream (i.e. landfill, organics, and recycling) captured in the audit. Within each major stream are subcategories, which helped to further sort the materials.

## Category Sorted

### Landfill

Material Type	Examples
Black/Brown Plastic	Sushi packaging, black/brown coffee cup lids
Styrofoam	Takeout food packages
Plastic Film	Ziploc bags, grocery bags, miscellaneous plastic film
Small Plastics	Plastic pieces smaller than a credit card
Broken Glass	Broken glass
Lab Waste	Tainted lab plastics, pipette tips
Other	Coffee grind wrappers, unidentifiable materials

### Organics

Material Type	Examples
Paper Towel	Tissue, Kleenex, bathroom hand towels
Coffee Grounds	Coffee grounds
Food Waste	Post-consumer food waste (e.g. fruit peels and rinds, Marquis Hall buffet leftovers)
Beverage Liquids	Juice/soda syrup
Paper	Soiled paper and cardboard, paper takeout boxes

### Recycling

Material Type	Examples
Plastic	Plastic beverage containers (PET), large milk or juice jugs
Coffee Cups	Tim Hortons, Starbucks, USask food services
Tetrapak Containers	Individual milk/juice boxes, bulk liquid containers
Cardboard	OCC (old corrugated cardboard)
Mixed Paper	Shredded/fine paper, newspapers, magazines
Aluminum	Soda cans, large soup cans

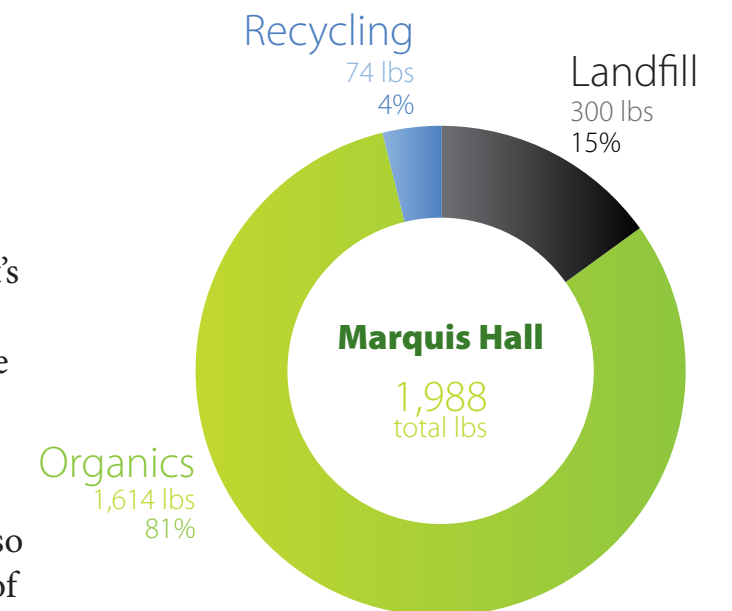
# Anomalies

This refers to physical items or operational challenges that would alter the composition of the waste stream.

Anomaly	Weight	Material
20 5-gallon containers	764 lbs	Grease trap cleanings
Marquis Hall	1,614 lbs	Food waste/landfill/recyclables

Across the first two days of the audit, twenty (20) 5-gallon containers were collected from both Louis' Pub and Place Riel. Upon further investigation, these were determined to be unrecoverable grease trap cleanings that would not be considered a part of regular weekly collections. As these are not a normal part of the university waste stream, they were eliminated from our total data to prevent skewing of results. They are included here for official documentation purposes.

While Marquis Hall was originally included within the scope of the audit, it was determined after the first day of sorting that it would be left out of this audit. The scale of waste collected on the first day for Marquis Hall far surpassed the capacity of the audit staff and would have prevented the success of the larger audit across the week. Based on the audit's one day sample, 85% of landfill waste generated at Marquis Hall may be eligible for diversion. To get a clear and defined scope of potential gains, this building will be addressed in a subsequent audit along with Health Science (which was also determined to surpass the feasible scale of work for this audit).



# Audit Results

The following is an overview of the audit findings for the selected buildings.

## Category Sorted

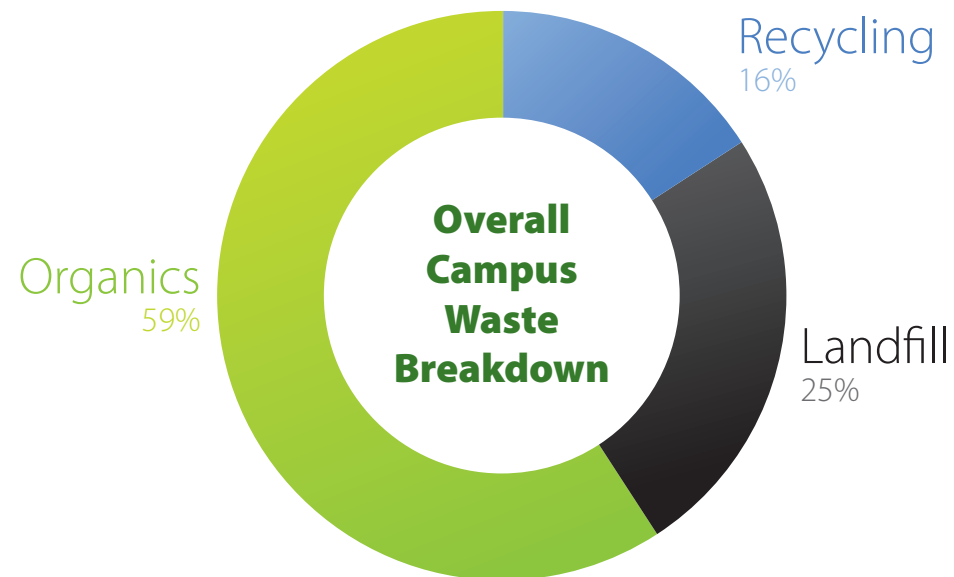
Based on the audit result, the total amount of waste generated for landfill disposal from the six (6) selected buildings at the University of Saskatchewan Saskatoon campus is estimated to be 13,405lbs/6,080.40kg/6.080mt over the course of seven (7) typical winter semester days. Excluding anomalies and trending forward, an estimated total weight of 554,892lbs/251,694kg/251.69 mt will be generated for as landfill waste annually from these buildings.

From the audited waste sample, landfill, organics, and recycling streams were found to represent 25%, 59%, and 16% of the total sample respectively.

# Diversification Opportunity

**Diversification Opportunity:** *the total organic and recyclable material minus the total material generated for landfill disposal.*

Based on the data collected from the six (6) designated buildings at the University of Saskatchewan Saskatoon campus during the audit and excluding anomalous data, a total of 414,388 (lbs) or 75% of the total waste was identified as a diversification opportunity.



## Waste Measured Over the Course of the January 21-25 Audit

Waste Stream	Pounds (lbs)	Kilograms (kg)	Metric Tonnes (mt)	%
Landfill	2,684	1,220	1.22	25%
Organics	6,251	2,841.36	2.84	59%
Recycling	1,718	780.91	0.78	16%
<b>Total</b>	<b>10,653</b>	<b>4,842.27</b>	<b>4.84</b>	<b>100%</b>

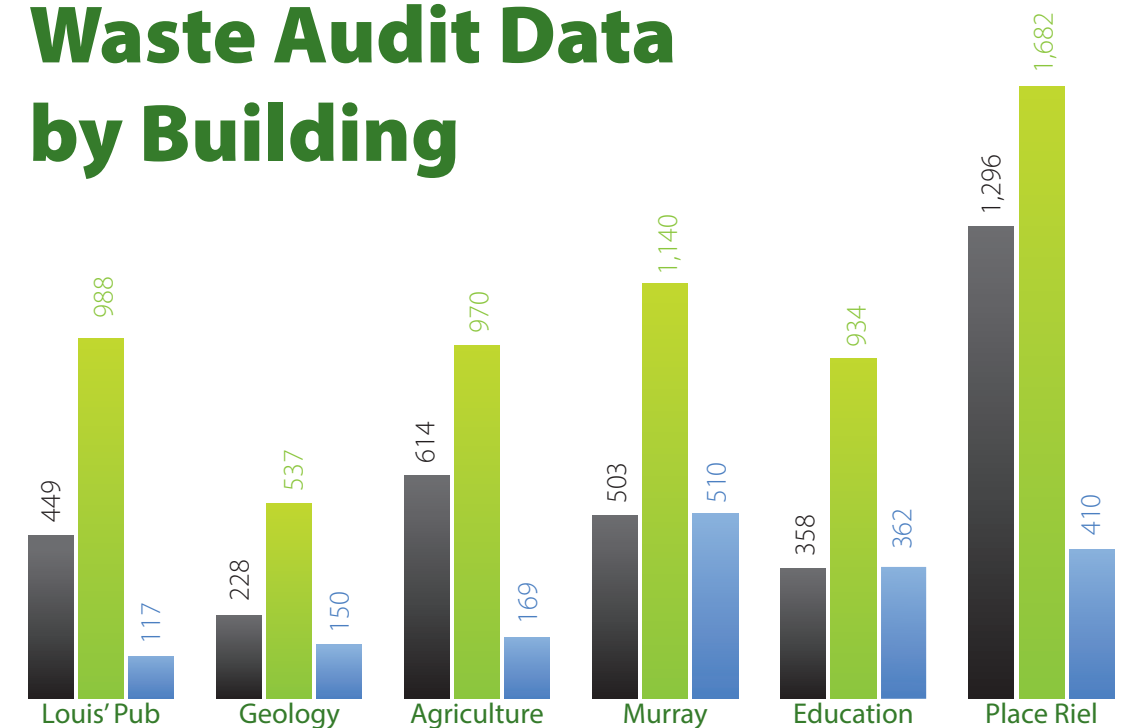
## Total Annual Waste Extrapolation for the Six Selected Buildings

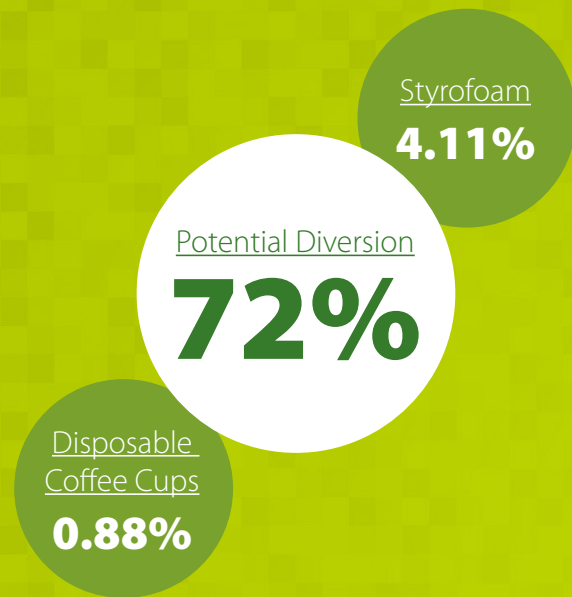
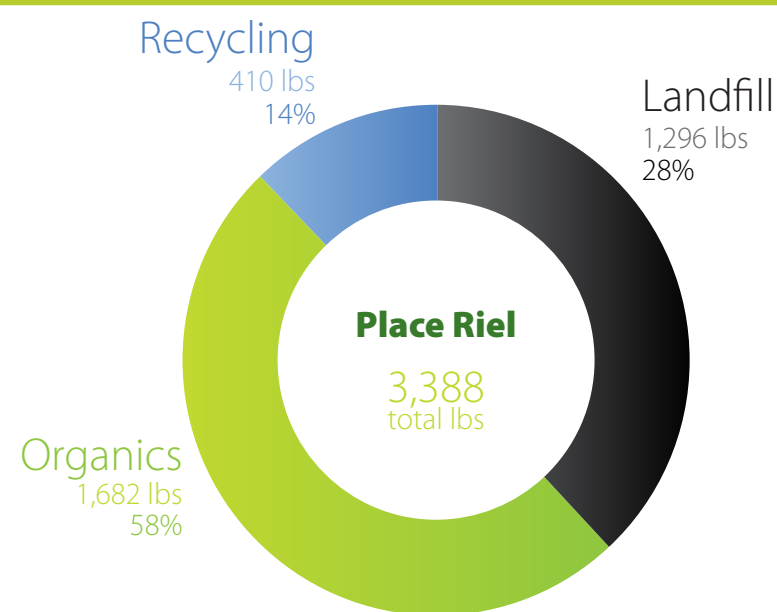
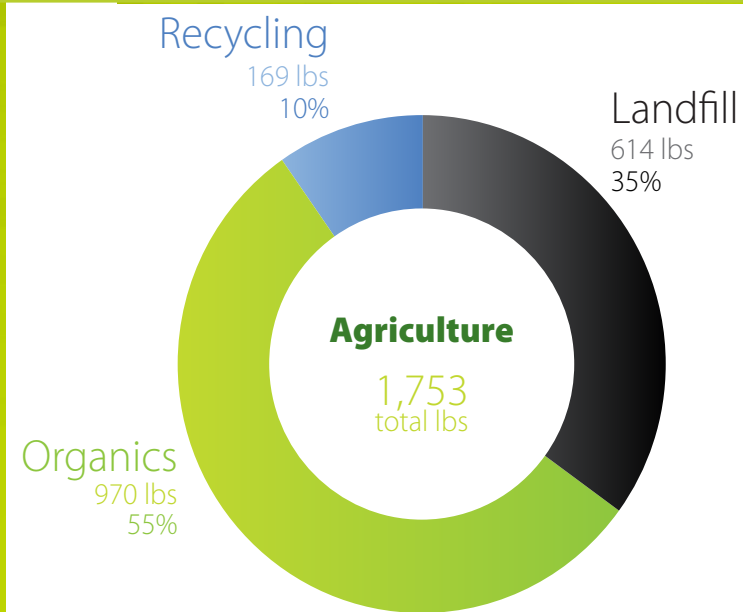
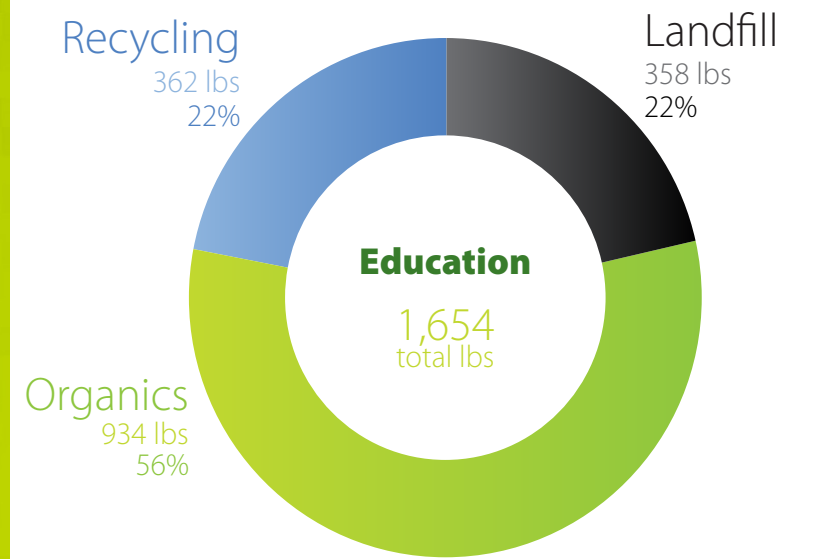
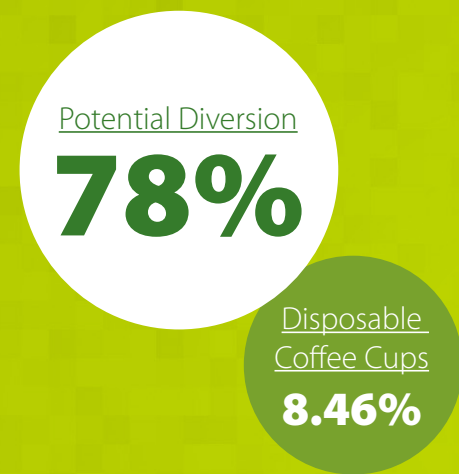
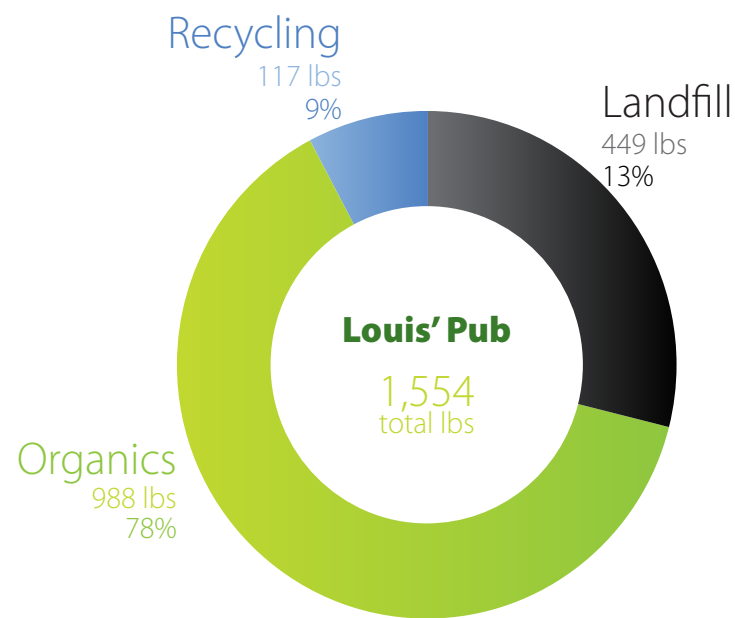
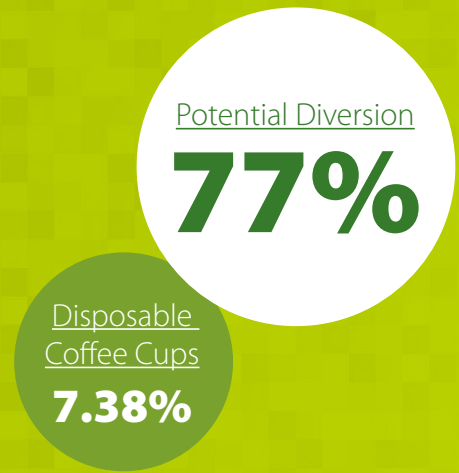
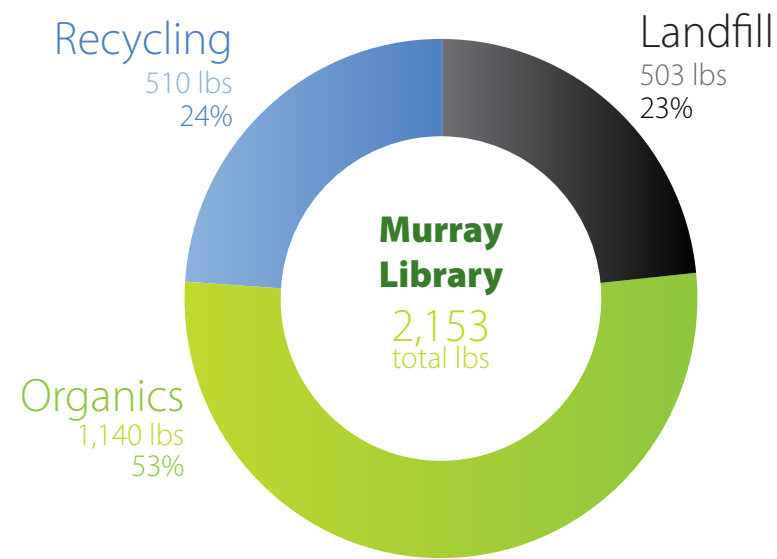
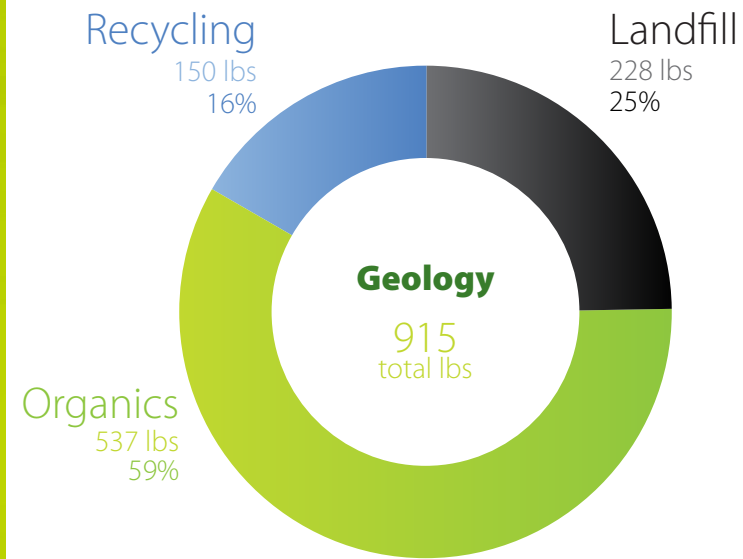
Waste Stream	Pounds (lbs)	Kilograms (kg)	Metric Tonnes (mt)	%
Landfill	140,504	63,732	81.33	25%
Organics	325,052	147,441	14.44	59%
Recycling	89,336	40,522.12	40.52	16%
<b>Total</b>	<b>554,892</b>	<b>251,695.12</b>	<b>136.29</b>	<b>100%</b>

## Total Annual Waste Extrapolation for the Six Selected Buildings

Waste Stream	Divertables (lbs)	Non-Divertables (lbs)	%
Landfill		140,504	25%
Organics	325,052		59%
Recycling	89,336		16%
<b>Total</b>	<b>414,388</b>	<b>140,504</b>	<b>100%</b>

## Waste Audit Data by Building





# Recommendations

Following the waste audit results, it is essential to identify the main areas of concern and focus on where improvements can be made. Narrowing available options and taking on one initiative at a time on a quarterly or semi-annual basis will increase the chances of success for each measure.

Organic materials represented the most significant amount of overall landfill waste in our waste stream. A primary focus of these recommendations will be to address this scale of organic waste at the university.

It should be mentioned that at the core of waste issues lies individual behaviour patterns, and that any strategy the University of Saskatchewan takes on would benefit from an additional focus on individual behaviour changes and cultural shifts towards source reduction and waste minimization.

## Improve the Organics Program

59% of the landfill waste measured during this audit was found to be organic waste material. Organic materials generally represent the greatest share of weight-based waste measurements, and diverting as many organic materials from the waste stream as possible will significantly increase the diversion rate and reduce the amount of waste sent to landfill annually.

A greater diversion rate could be captured by adopting a phased organic waste management strategy from the outset. These phases, based on the greatest potential for capture and efficient management, include:

1. Expanding the existing organics program across campus to all food service outlets.
2. Expanding the existing organics program to lunchrooms and volunteer office spaces.
3. Expanding the existing organics program to general public areas .

Pursuing a phased roll-out such as this is recommended to distribute costs over time, address particularly troublesome sources of organic waste, and to reduce confusion and education requirements among the campus community.



*A sample of Styrofoam and coffee cups collected through the week.*

## Improve User Waste Diversion Behaviour

It is recommended that future waste programs on campus should encourage staff and students to take individual ownership of managing the disposal of waste generated to improve participation and success rates. Regular, unscheduled, and unannounced internal waste assessments should also be conducted throughout the campus to obtain up-to-date data and to maintain regular feedback for the campus community.

By determining which areas need improvement, continuing to post proper signage, providing receptacles as required, and continuing to expand on waste education, we hope to improve the source separation of these items and better capture recyclable materials. In addition, it is recommended that the university continue to purchase and distribute colour-coded waste stations with consistent signage across campus.



*Styrofoam, a particular problem material, collected from Place Riel.*

## Employee, Student, and Visitor Education

Educational information should be displayed on campus waste receptacles and in strategic locations across campus to educate the campus community about waste at the university. This signage should be frequently updated to engage employee and student participation.

Clear, visible guidelines and signage are also essential to the success of any waste reduction program. All areas of the campus should be equipped with appropriate signage to clearly indicate to visitors who are not familiar with the program at the University of Saskatchewan which materials are accepted in the waste receptacles and to remind them of the importance of their involvement in the waste reduction programs. Guidelines should be posted wherever receptacles are stationed.

## Monitoring and Evaluation

One of the keys to a successful waste reduction program is gathering quantifiable results to follow the progress of the program. Ensure that a waste audit is completed annually and keep track of the data results year to year to compare diversion rates. Send out monthly, or quarterly diversion reports across campus communication channels to students and staff pointing out areas of success and where improvements are necessary.

# Conclusion

Based on the information gathered through this 2019 waste audit at the University of Saskatchewan Saskatoon campus, the six (6) selected buildings would generate 554,892 (lbs)/251,694.77(kg)/251.69 (mt) of material for landfill disposal annually, of which 140,504 (lbs)/63,731.54 (kg)/63.731 (mt) (or 25%) are non-divertible materials and a total of 414,388 (lbs)/187,963.23 (kg)/187.96 (mt) (or 75%) are identified as divertible. In order to address, increase and monitor waste diversion effectiveness at the University of Saskatchewan, the following suggestions should be considered to improve the existing program and efforts of employees, students, and visitors:

- Provide landfill/recycling receptacles side by side wherever garbage bins exist;
- Ensure that adequate signage is placed on or above all landfill/recycling receptacles and the signage remains consistent throughout campus buildings;
- Education throughout the campus can be promoted through promotional and awareness events; and
- Provide employees and students with information on waste diversion and reduction procedures and services on the USOS website.

The success of waste diversion initiatives depends on the involvement of all parties (employees, students, and visitors) at the University of Saskatchewan. The more involved all parties are in the waste reduction and diversion goals of the University of Saskatchewan, the greater the success of the program.







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