



# **Taking out our trash: Insights from the UWinnipeg 2023 waste audit**



THE UNIVERSITY OF  
**WINNIPEG**

Sustainability



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# Letter from UWinnipeg's Campus Sustainability Office

The University of Winnipeg published its first Sustainability Policy in 2006. Since then, our institution has diligently pursued resource management solutions that invest in our natural environments and human communities. Waste management is an obvious and important piece of this puzzle. With the right approach, waste management programs can go beyond reducing environmental damage caused by landfilling – they can add value to ecosystems and communities by contributing to renewable resource economies. UWinnipeg's waste management systems exist to make sure that all types of materials leaving campus end up in the most sustainable destination.

Education and communication are essential to the success of our landfill diversion efforts. But, having strong waste management infrastructure and community partnerships is only worthwhile if campus users (faculty, staff, students and, community members) understand where and how to discard different items. Put simply, waste management at UWinnipeg is about integrating individual behaviors with our waste collection infrastructure, and working with service providers that offer sustainable waste processing solutions.

Waste audits give us the data needed to pinpoint key variables, such as overall waste stream volumes, the quantity of organic and recycled waste being wrongfully sent to landfill, and items that are most frequently discarded incorrectly. Equipped with the findings of waste audits, sustainability managers at UWinnipeg can focus on making necessary improvements to infrastructure and develop specific outreach and engagement strategies. The 2023 waste audit is particularly useful in this regard as it was intentionally planned prior to a \$150,000 multi-stream waste bin improvement project. By auditing before and after the new waste bins are installed, we can measure how effective they are at increasing proper disposal and landfill diversion.

The Campus Sustainability Office (CSO) would like to acknowledge the University of Winnipeg's ongoing investment in effective waste management practices. Certainly, without this leadership, our institution would be sending far more unsorted waste to the Brady Road Landfill. We encourage everyone on campus to continue doing their part by taking time to sort their waste and find the appropriate waste receptacles for all their discarded items. Finally, the CSO thanks the twenty-three UWinnipeg students and members of the West End community who joined the 2023 waste auditing team. Without their passion, dedication, and long hours spent sorting through thousands of waste bags, this undertaking would not have been possible. Moreover, their involvement reiterates the added value and mutual benefits that arise when the University of Winnipeg creates hands on learning and development opportunities for our students.

Optimistically,



**Joseph Wasylcia-Leis**  
Coordinator, Campus Sustainability Office

# Why does Landfill Diversion Matter?

The University of Winnipeg produces over 100,000 kilograms (kgs) of waste every year, sending well over half to the Brady Road Landfill. Conventional landfills pose several significant threats to both natural and built environments. Household and commercial waste often contains harmful toxins. These materials accumulate in landfills, often leaching into soil and watersheds. Furthermore, when organic materials are sent to landfill, they decompose anaerobically, releasing substantial amounts of methane – a greenhouse gas that is twenty-five times more potent than carbon dioxide.

When households, businesses, institutions, and governments work together to divert certain types of waste from landfills and into alternative channels of waste processing, they lessen the negative impacts of landfills, and provide additional benefits to environments and people. When organic materials are taken to composting facilities, they release nitrogen and oxygen rather than harmful methane. The final material output is a nutrient-rich fertilizer that can be used for agriculture or returned to local ecosystems in other ways. Large-scale recycling facilities – like the one operated by Green for Life in Winnipeg – specialize in sorting a wide range of reusable materials and getting them to market.

Sustainability Tracking, Assessment and Rating System (STARS is an international reporting framework that helps post-secondary institutions measure and compare the strength and impacts of their sustainability initiatives across a wide range of indicators. STARS recognizes institutions that are “minimizing their production of waste, diverting materials from landfills and incinerators, and conserving resources by recycling and composting”. UWinnipeg's Ongoing Waste Guidelines call on our institution to divert at least 40% of general waste and 100% of discarded electronics and batteries from landfill. Unfortunately, the 2023 Waste Audit revealed that we still have a long way to go when it comes to keeping organic and recyclable materials out of the landfill.

# What is a Waste Audit?

Waste audits are processes undertaken by any organization, business, or institution to determine the contents and destination of all waste generated by day-to-day operations. While the University of Winnipeg receives monthly weight reports from recycling, landfill, and organic waste collectors, periodic audits must be done to know what is really happening inside our waste bins.

2023 marked the seventh waste audit conducted at UWinnipeg since 2006. These audits provide the data necessary to monitor and improve our waste management performance. They allow us to monitor a wide range of indicators, including the total amount of organic, recyclable, and landfill waste generated on campus, the amount of organic and recyclable materials being wrongfully sent to the landfill, areas on Campus with high rates of improper disposal, and items from our campus food provider that most commonly end up in the wrong bins. Equipped with the findings of waste audits, sustainability managers can focus on making necessary improvements to infrastructure and develop specific outreach and engagement strategies.

See Appendix (page 19) for a glossary of waste auditing terms used in this report.

# Undertaking the Waste Audit

## Objectives of the 2023 Waste Audit

- › Determine the total amount of waste leaving campus during an average week
- › Determine the quantity and percentage of waste from our campus that is improperly sent to landfill
- › Determine the level of contamination found in our organic and recycling waste streams
- › Determine how much multi-stream waste bins improve capture and diversion compared to single-stream bins
- › Identify items that are most frequently discarded into incorrect streams
- › Identify specific opportunities for outreach and education to improve landfill diversion
- › Establish a baseline against which we can measure the impact of waste infrastructure upgrades

## Scale and Scope

To achieve these goals, the University's 2023 waste audit examined all outgoing organic, recyclable, and landfill waste from all campus buildings for five days (February 7 to 11). Waste from five building clusters on campus were analyzed separately each day to account for fluctuations in population and to enable comparison between different areas on campus. The audit examined the contents of waste bags coming from single-stream bins in classrooms, hallways, and offices, as well as multi-stream bins found throughout campus. Auditors were also able to separately analyze waste from Diversity Food Services' kitchens. All told, our audit team sorted over 2000 kgs of material over the five-day audit period.

## Logistics and Stakeholder Collaboration

Completing the 2023 audit required collaboration and coordination among several UWinnipeg entities. The CSO worked with Facilities Management and Health and Safety to secure a suitable space for waste examination in the Lockhart Hall basement parking garage. Cleaning staff were also instrumental in the success of the audit. They needed to change their normal waste collection routine during the audit, and redirect all waste bags to our "sorting center."

The CSO also worked with Dexterra, the University's contracted cleaning service provider, to train staff on labelling and transporting bags for data analysis. Green for Life and Compost Winnipeg adapted their compost, recycling, and garbage pickup schedules to handle the large volume of waste accumulating at a single location on Main Campus during the audit week.

# Data Collection and Analysis

The 2023 Waste Audit accounted for three main variables:

1. Waste streams (i.e., waste bag types: organics, recycling, and landfill)
2. Building clusters (Main Campus, West Campus, Rice-AnX, Buhler, and Diversity Kitchens);
3. Bin types/locations (hallway multi-stream bins, washroom bins, and single-stream bins in offices, hallways, and classrooms)

Each sample taken during the audit was classified into a "sample type" by assigning it a characteristic for each of the three variables. Here are a few examples of sample types examined during the 2023 Waste Audit:

- › Main Campus - Multi-Stream - Organics
- › West Campus - Single-Stream Hallway - Landfill
- › Buhler - Single-stream Office - Recycling

As bags from across campus arrived at the sorting center, auditors sorted them by sample type into piles. At the start of each audit day, CSO staff created a list of sample types for examination based on the types and volumes of available bags. The aim was to collect enough data to answer each of our pre-determined questions about UWinnipeg's waste profile.

Given the number of bags belonging to some sample types, it was not always possible to sort every bag. Once auditors sorted a sizable portion of a sample type for that day, any remaining bags were weighed without being examined. The category ratios from the sorted bags were then applied to weighed-only bags of the same sample type, in order to estimate their contents.

In the weeks following the audit period, CSO staff worked to create an excel database. They populated it with all the data points from the collection sheets and ran queries to analyze the data. Soon, a clear picture of waste management at UWinnipeg emerged.



## What's in our trash?



## Analyzing the results of the 2023 waste audit



**40%**

Organic materials make up 40% of all waste leaving campus. However, only 28% of all organic materials is sent for composting.



**35%**

Only 35% of waste generated on campus should be going to landfill. Yet, 59% of all campus waste goes to Brady Road Landfill.



**70%**

70% of all recyclable materials discarded on campus end up in the correct stream.



**55%**

Just over half (55%) of all waste generated at UWinnipeg goes into the correct waste stream



**64%**

64% of all organic waste generated on campus ends up in the landfill stream, with an additional 8% ending up in the recycling stream.



**70%**

70% of all waste found in single-stream bathroom bins is paper towels, which could be composted.

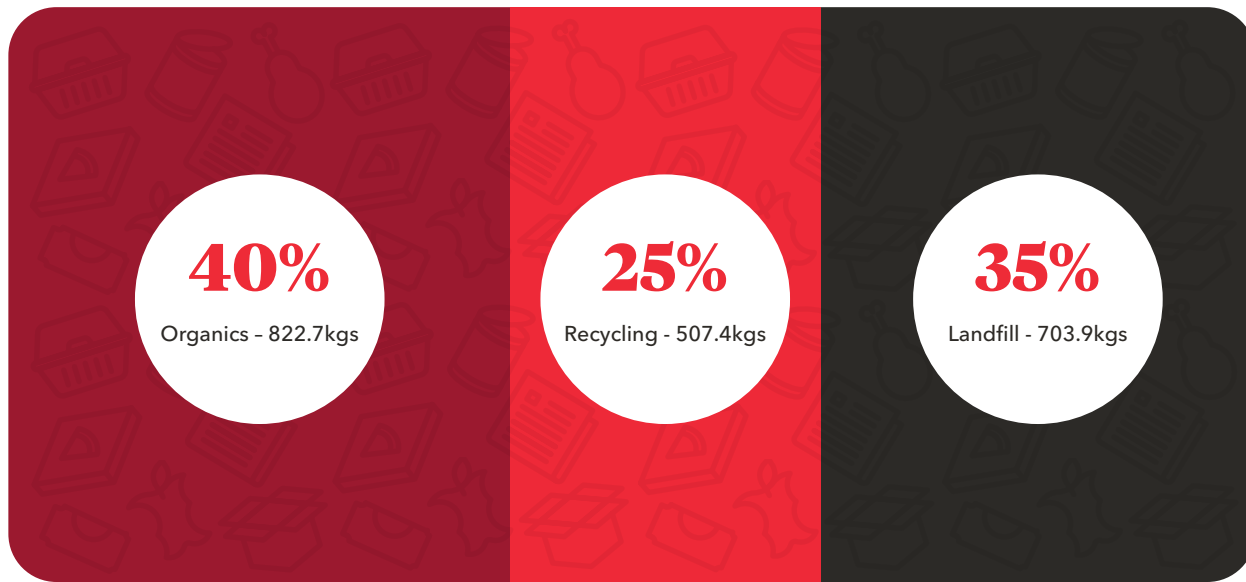
# Campus-wide Waste Profile



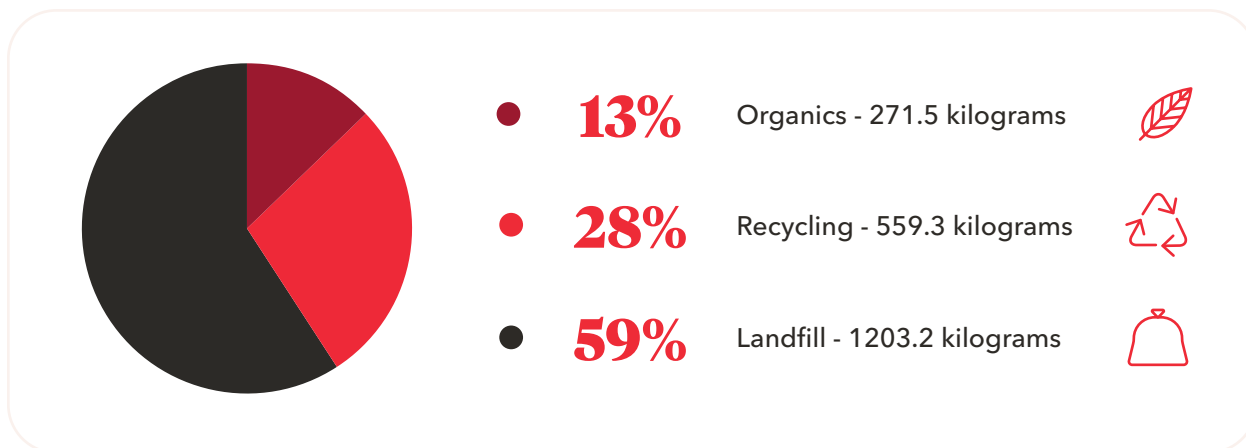
**2034kg**

UWinnipeg's Campus generates 2034 kgs of waste per week – enough garbage to equal the mass of a full-grown hippopotamus.

Total waste leaving UWinnipeg, broken down by material type:

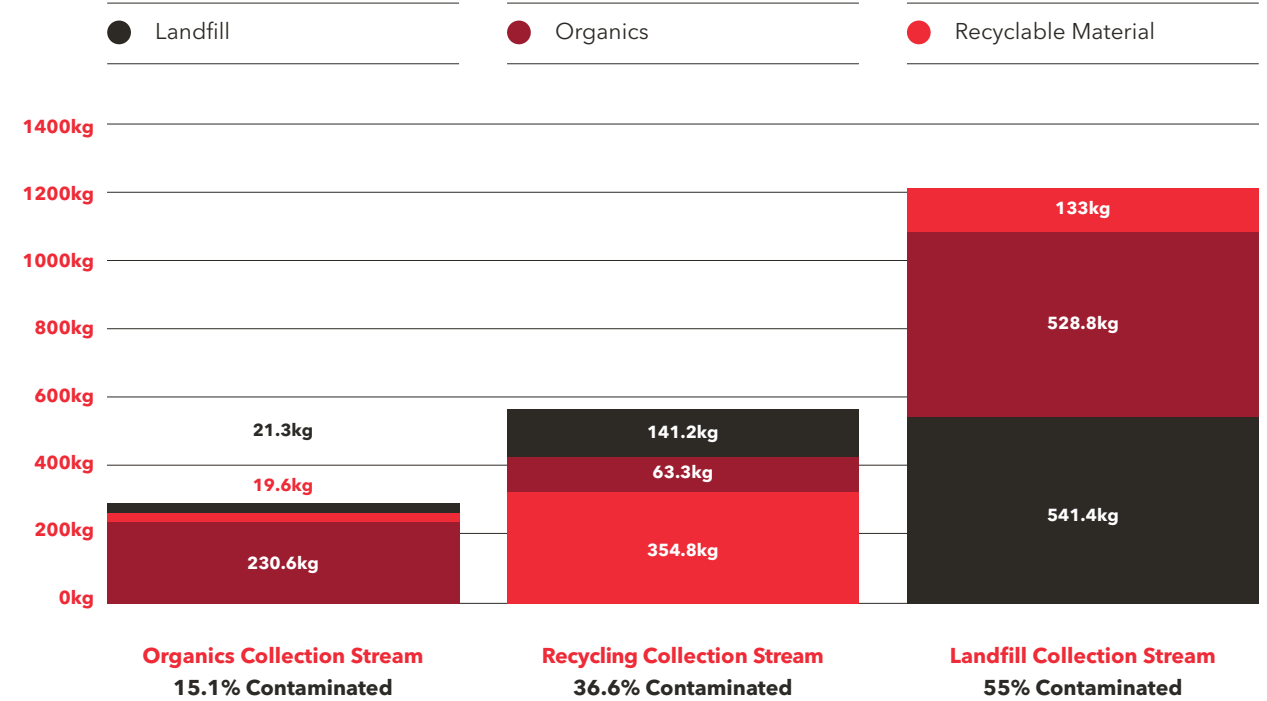


Total waste leaving UWinnipeg, broken down by waste collection stream:



# Waste Stream Volumes, Proper Diversion, and Contamination

Contamination (improper disposal) found in each waste collection stream leaving campus:



Where does UWinnipeg's organic waste end up?



Where does UWinnipeg's recycling waste end up?



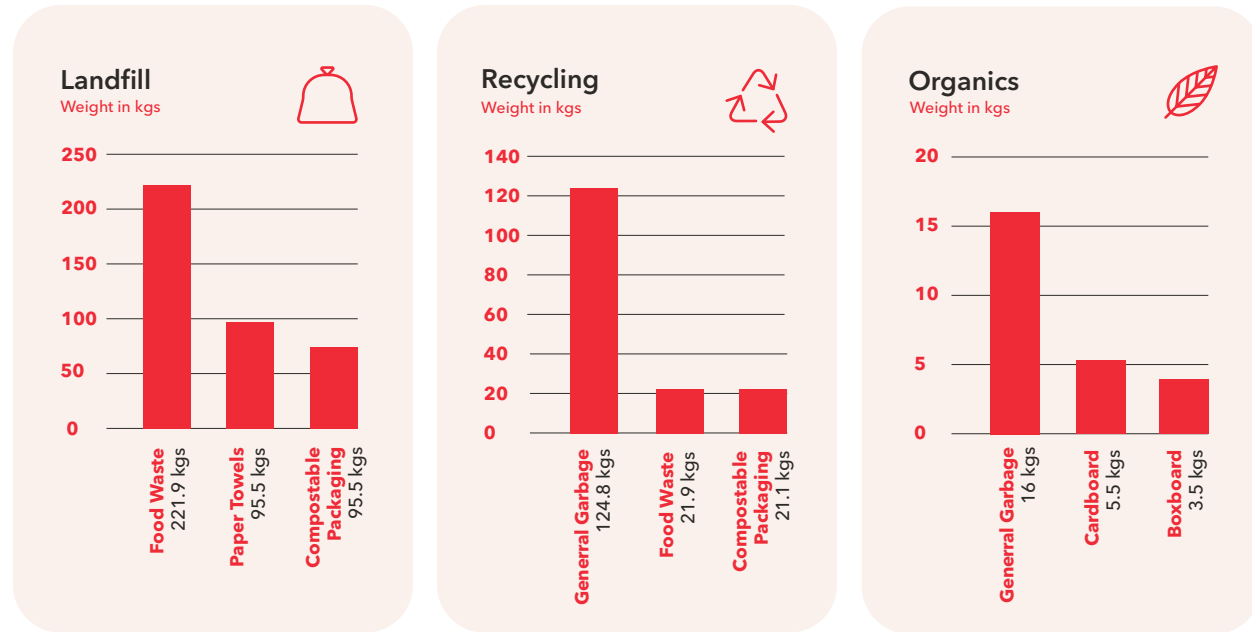
Where does UWinnipeg's landfill waste end up?



Legend: Landfill Stream (black), Organic Stream (dark red), Recycling Stream (red)

# Sources of Contamination

Top 3 sources of contamination, measured in kilograms



Fast facts comparing proper disposal and contamination between single-stream and multi-stream collection bins

**55%**

55% of all waste found in single-stream landfills bins is contamination, consisting of 38% organics and 17% recycling.

**6000kgs**

Each year, over 6000 kgs of organic materials don't get composted because they end up in single-stream bins located in classrooms, offices and hallways.

**53%**

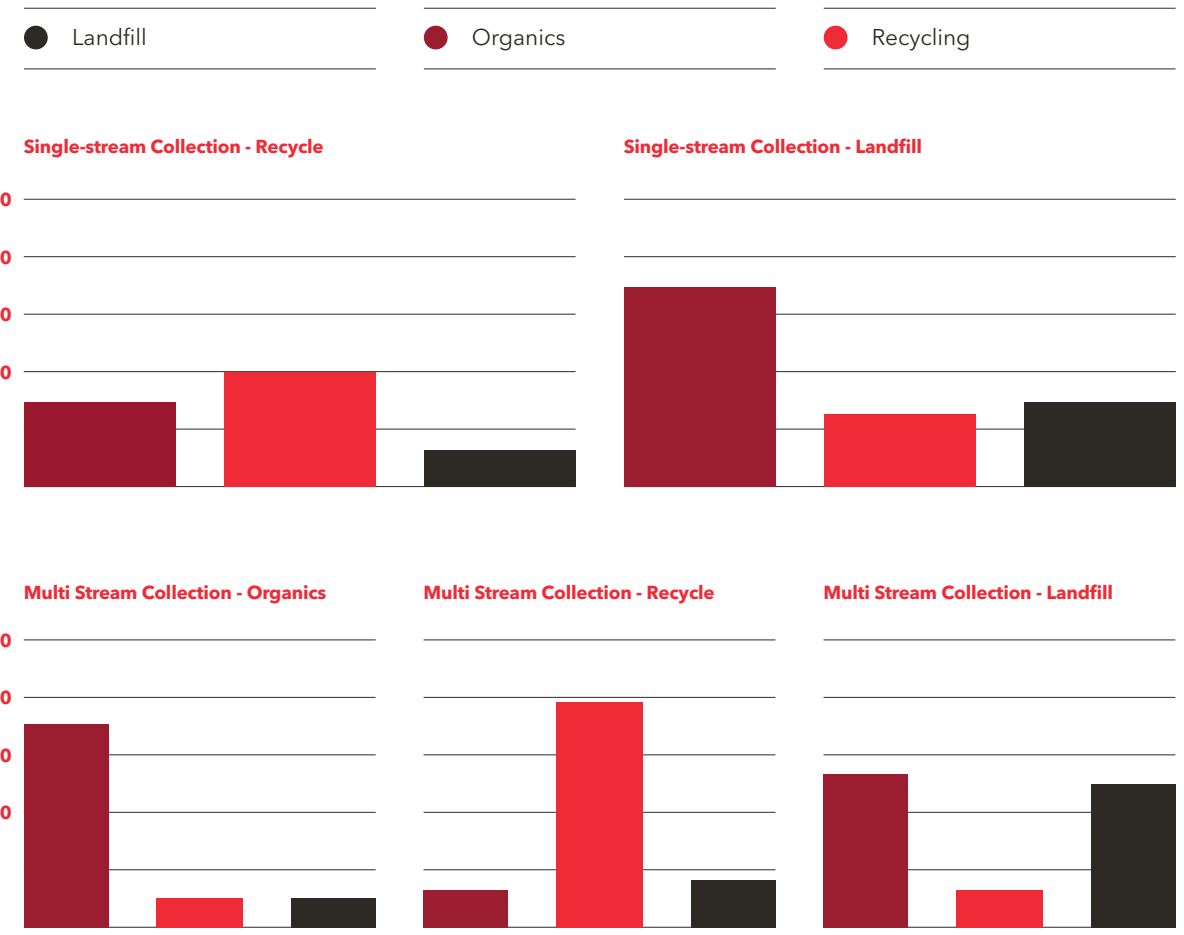
Multi-stream bins increase the rate of correct disposal of organic materials by 53%, by 23% for recyclable materials, and by 21% for landfill waste.

**17%**

17% of all contamination found in the landfill stream is food waste, which could be composted.

# Single Stream vs Multi-Stream Collection Bins

Comparing rates of proper disposal and contamination.



Increases in the likelihood of proper disposal between single-stream and multi-stream bins for each waste type			
	Single-stream Collection Bins	Multi-stream Collection Bins	% Increase
Organics	0%	53%	53%
Recycling	54.7%	77.2%	22.5%
Landfill	44.3%	65.1%	20.8%



# Recommendations and Next Steps

Findings from UWinnipeg's 2023 Waste Audit indicate that our institution's waste management systems are effective, but there is also substantial room for improvement. Our organics and recycling collection efforts divert more than 25,000 kgs of material from the landfill each year. However, we still send over 60% of all campus-generated waste to landfill. Over half of this amount consisting of materials that do not need to be sent to landfill. Despite having post-consumer organic material collection on campus for over fifteen years, our compost collection bins are frequently rejected by our organic waste hauler due to contamination, and large volumes of compostable food containers end up in our landfill stream.

**To reduce contamination and increase landfill diversion, The University will implement the following improvements to our waste management program:**

1. **Assess and reduce the number of single-stream bin locations across campus.**

Assess the distribution of single stream recycling and landfill bins in classrooms, hallways and communal spaces across campus and consider removing these where multi-stream waste bins are/can be made accessible. Use this assessment along with a review of best practices at other institutions to develop a guideline or procedure for waste bin distribution and use. People tend to take the path of least resistance when it comes to getting rid of waste. For example, if an administrator eats lunch in their office and has a single-stream black garbage bin on-hand that is emptied regularly by cleaning staff, they have no incentive to take their organic lunch waste to a multi-stream bin. If their closest and only nearby option is a multi-stream bin, individuals will at least have an opportunity to separate their recycling and compost.

2. **Add more multi-stream waste collection bins across campus.**

The waste audit showed that campus users are more likely to sort their waste and remember to compost when using multi-stream bins. If we take single-stream bins away, we must ensure people encounter multi-stream bins often and that they can find them quickly and easily whenever needed. More than fifty new multi-stream bins have already been put into service since the start of 2023, with more set to arrive later this year.

3. **Finish the multi-stream rebranding effort.**

The multi-stream bins seen across campus were introduced over fifteen years ago. Understandably, they have lost their luster, and the messaging is not completely accurate. To make our bins easier to find and provide clearer instructions for users, all new bins will be built with larger backboards and updated decaling. The eighty existing, first-generation bins will be retrofitted to match the new design and style.

4. **Outreach and education for campus community members.**

To accompany the newly-branded bins, Campus Sustainability staff are developing a suite of new educational materials and engagement programming to boost waste disposal literacy on campus. Among other things, they will develop waste sorting instructions in our new Sustainable Office, Sustainable Campus Living, and Sustainable Events guides. They will train a team of student Sustainability Ambassadors, who will engage their peers with class talks and at bin sites throughout campus.

In addition to implementing the recommendations listed above, sustainability managers at UWinnipeg, will continue exploring other waste management innovations. For example, an economic case could be made (as well as an environmental one) to do our own composting on-site. Sustainability staff will look at the level of organic materials generated on campus, the cost of our organics collection service, and the elevated levels of contamination. They will also arrange a site visit to the Forks to learn more about their on-site composting operations and ongoing post-consumer waste sorting program.

UWinnipeg will conduct our next internal waste audit in March of 2025, with the goal of measuring the impact of our planned changes on the sustainable waste management performance outcomes.



# Appendix

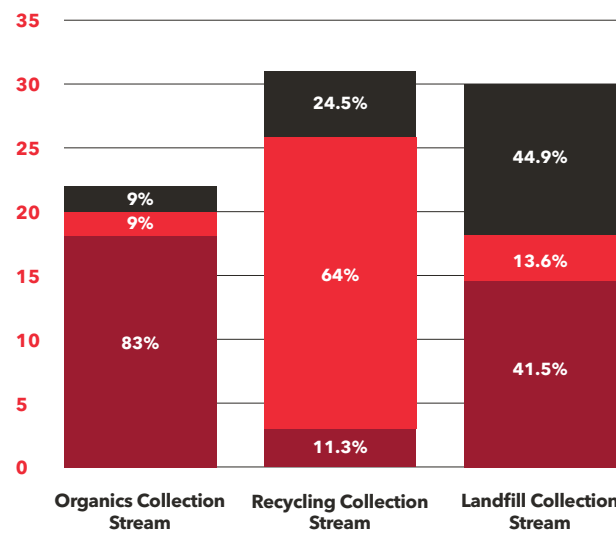
Waste Type	Amount (kgs) found in Landfill Collection Stream	Amount (kgs) found in Organics Collection Stream	Amount (kgs) found in Recycling Collection Stream	Total waste generated by Waste Type (kgs)	Rates of proper and improper disposal (%)
<b>All Campus</b>					
Organics	528.8	230.6	63.3	822.7	28.0
Landfill	541.5	21.3	141.2	704.0	76.9
Recycling	133.0	19.6	354.8	507.4	69.9
Total waste in stream	1203.3	271.5	559.3	2034.1	
% of improperly disposed waste in each stream	55.0	15.1	36.6		Improper: 44.6 Proper: 55.4
<b>All Campus (excluding Diversity)</b>					
Organics	496.8	177.0	59.2	733.0	24.2
Landfill	519.1	20.1	136.2	675.4	76.9
Recycling	129.3	19.2	333.0	481.5	69.2
Total waste in stream	1145.3	216.3	528.3	1889.9	
% of improperly disposed waste in each stream	54.7	18.2	37.0		Improper: 45.5 Proper: 54.5
<b>Diversity</b>					
Organics	32.0	53.6	4.1	89.7	59.7
Landfill	22.3	1.3	5.1	28.6	77.9
Recycling	3.7	0.4	21.8	25.9	84.3
Total waste in stream	58.0	55.2	31.0	144.2	
% of improperly disposed waste in each stream	61.6	3.0	29.6		Improper: 32.3 Proper: 67.7

Waste Type	Amount (kgs) found in Landfill Collection Stream	Amount (kgs) found in Organics Collection Stream	Amount (kgs) found in Recycling Collection Stream	Total waste generated by Waste Type (kgs)	Rates of proper and improper disposal (%)
<b>Main Campus</b>					
Organics	241.5	134.8	44.2	420.5	32.1
Landfill	261.5	14.3	95.5	371.3	70.4
Recycling	79.2	12.5	250.3	342.0	73.2
Total waste in stream	582.2	161.6	390.0	1133.8	
% of improperly disposed waste in each stream	55.1	16.6	35.8		Improper: 43.0 Proper: 57.0
<b>Buhler</b>					
Organics	32.6	13.6	4.2	50.4	27.0
Landfill	31.4	3.3	3.6	38.3	82.0
Recycling	18.9	1.3	14.3	34.5	41.4
Total waste in stream	82.9	18.2	22.1	123.2	
% of improperly disposed waste in each stream	62.2	25.3	35.3		Improper: 51.9 Proper: 48.1
<b>RMD</b>					
Organics	104.3	26.9	3.8	135.0	19.9
Landfill	186.3	2.4	15.3	204.0	91.3
Recycling	18.3	5.2	31.2	54.6	57.1
Total waste in stream	309.0	34.5	50.3	393.7	
% of improperly disposed waste in each stream	39.7	22.0	37.9		Improper: 37.9 Proper: 62.1
<b>Rice   AnX</b>					
Organics	49.7	13.6	4.2	67.5	20.1
Landfill	35.5	3.3	3.6	42.4	83.7
Recycling	18.9	1.3	14.2	34.4	41.3
Total waste in stream	104.1	18.2	22.1	144.3	
% of improperly disposed waste in each stream	65.9	25.2	35.5		Improper: 56.1 Proper: 43.9

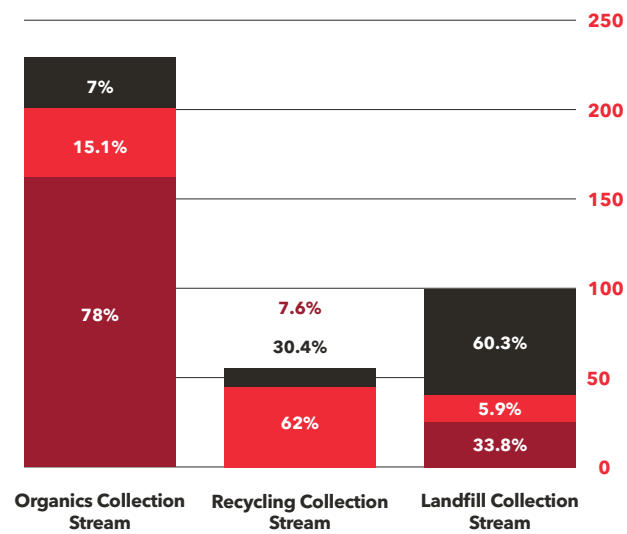
# Building-by-Building Comparison of the Waste Profiles and Stream Contamination Rates



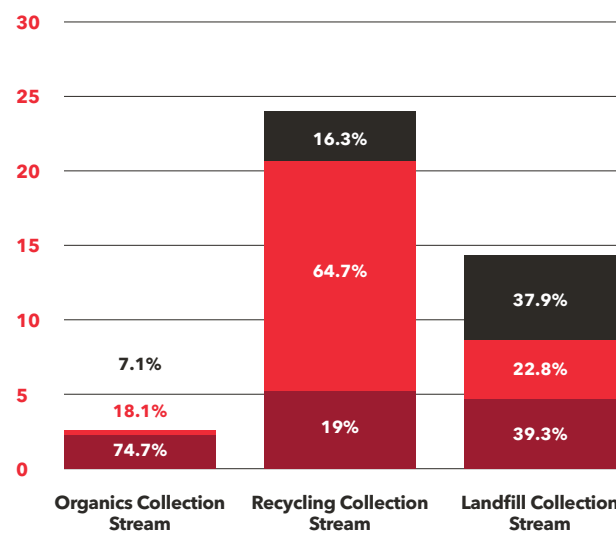
Main Campus - Weight in kgs



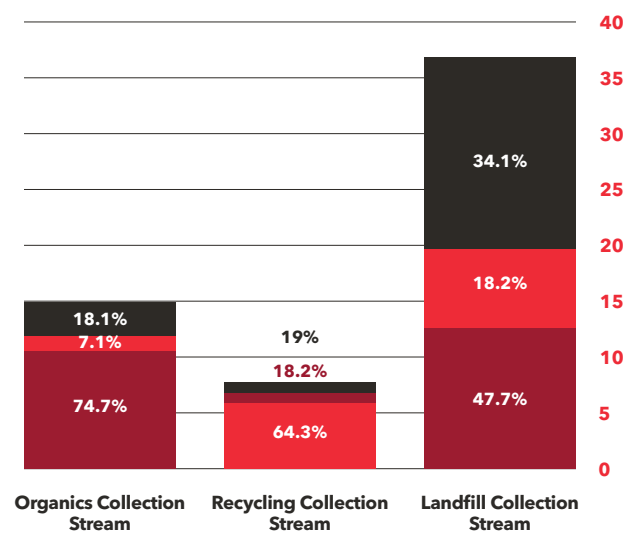
West Campus - Weight in kgs



Buhler - Weight in kgs



Rice / Anx - Weight in kgs



# Waste Audit Terminology

Important terms appear frequently throughout this report, and are defined as follows:

**Waste stream:** The infrastructure and human activities designed for the disposal, collection, transportation, and transformation of a specific type of waste. The primary waste streams examined during this audit were compost, recycling, and landfill. Each of the three main waste streams on campus are divided by their bag colour - green bags go into the organics stream, clear bags into the recycling stream, and black bags into the garbage.

**Organics:** Any plant or animal products considered food scraps, and any products made entirely from organic materials. Under the right conditions, organic waste decomposes, returning the organic matter to ecosystems in the form of compost. This audit considered two categories of organics, food products, and paper and packaging products made of organic materials.

**Recycling:** All materials generated within a waste management system that can be diverted from landfills through transformation or repurposing of said materials. Recycling is a broad waste stream that contains several other streams, including e-waste, paper, and co-mingled recycling.

**Landfill:** Any objects or materials that cannot be organically decomposed or recycled, which are, therefore, best suited for conventional landfills.

**Single-stream bin:** Containers for collecting waste that accommodate only one primary waste stream, for example, blue bins are for recycling, and black bins for landfill.

**Multi-stream bins:** Containers that provide for the disposal of multiple types of waste. At UWinnipeg, we have four-stream bins for collecting organic waste, beverage containers, co-mingled recycling, organic waste.

**Capture rate:** The percentage of all recyclable, organic, and landfill materials that are properly disposed of into their correct collection stream.

**Diversion rate:** The portion of all waste generated that is diverted from landfill via various organic and recycling streams.

**Contamination rate:** The amount of foreign waste found in a particular waste stream expressed as a percentage of the total waste in that stream. For example, the portion of landfill, and recycling products found in the organic waste stream. High rates of stream contamination can result in organic and recycling haulers rejecting loads which are then sent wholesale to landfill.

**Waste profile:** The quantitative breakdown by weight and ratio of each waste type and sub-category found in each waste stream under consideration, including capture and diversion rates. It is possible to determine waste profiles for a single bag of garbage, all the waste generated in on building or across campus, or for a specific type of collection bin.



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