

**Waste and Recyclable Materials Report
Q4 2019
Thompson Rivers University
Kamloops, British Columbia**

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Executive Summary

TRU demonstrates leadership in waste management, managing 23 different waste streams generated by students, faculty, staff and visitors on campus and diverting those materials into markets. TRU has overcome challenges by thinking creatively and continuously striving to achieve waste diversion targets.

While the overall waste diversion increased only slightly to 61% in 2019 over 2018 levels of 60%, Q4 shows waste diversion rate showed a significant increase to 70%.

The following report shows the weight and cost data for the types of waste managed by TRU for Q1 through Q4 and the total for 2019.

The table below is a summary of these weights and costs for each waste stream based on actual and estimated data. Total waste stream managed by TRU in 2019 was 689130 kg, and total cost of \$172,286.18. Some numbers in this report differ from previous quarterly reports as additional data was provided.

For readability, waste streams have been grouped. For a full listing of all the waste stream data see Appendix A. The garbage, packaging, and food waste groups are described as follows:

Garbage includes material collected by the City and by Waste Connections as well as some contaminated woodbins, described in this report as Landfill - DLC.

Packaging includes mixed recycling, cardboard, refundable beverage containers, plastic bags, and Styrofoam.

Food waste includes meat scraps, coffee grounds, food waste from kitchens, and zero waste stations, as well as cooking oil.

Table 1 Waste Stream Weights and Costs Total 2019, Q1 through Q4

Reporting Period		
Stream	Weight (kg)	Cost
Total 2019	689130	\$172,286.18
Garbage	266233	\$52,287.21
Wood & metal	175596	\$22,086.51
Yard waste	119176	\$0.00
Packaging	72407	\$60,183.33
Food waste	47001	\$17,028.80
Reuse	6349	\$0.00
Batteries, electronics and hazardous	2368	\$8,000.00
Consulting	0	\$12,000.00
Capital	0	\$700.33

Q4 - 2019	147237	\$54,259.00
Yard waste	45225	\$0.00
Garbage	39868	\$12,809.04
Wood & metal	29491	\$5,945.65
Packaging	16592	\$15,558.98
Food waste	14011	\$5,245.00
Reuse	1686	\$0.00
Batteries, electronics and hazardous	364	\$8,000.00
Consulting	0	\$6,000.00
Capital	0	\$700.33
Q3 - 2019	187075	\$45,557.30
Garbage	72713	\$12,628.84
Wood & metal	49269	\$6,239.36
Yard waste	31387	\$0.00
Packaging	22522	\$15,127.30
Food waste	9412	\$5,561.80
Reuse	1473	\$0.00
Batteries, electronics and hazardous	299	\$0.00
Consulting	0	\$6,000.00
Q2 - 2019	216910	\$36,417.88
Garbage	76196	\$12,216.08
Wood & metal	70532	\$7,457.50
Yard waste	42564	\$0.00
Packaging	15956	\$15,012.80
Food waste	9260	\$1,731.50
Reuse	1485	\$0.00
Batteries, electronics and hazardous	917	\$0.00
Q1 - 2019	137908	\$36,052.00
Garbage	77456	\$14,633.25
Wood & metal	26304	\$2,444.00
Packaging	17337	\$14,484.25
Food waste	14318	\$4,490.50
Reuse	1705	\$0.00
Batteries, electronics and hazardous	788	\$0.00
Yard waste	0	\$0.00

The following charts show the waste streams percent by weight and by cost for 2019 and for each reporting period (Q1 - Q4).

Figure 1 - Total Weight 2019

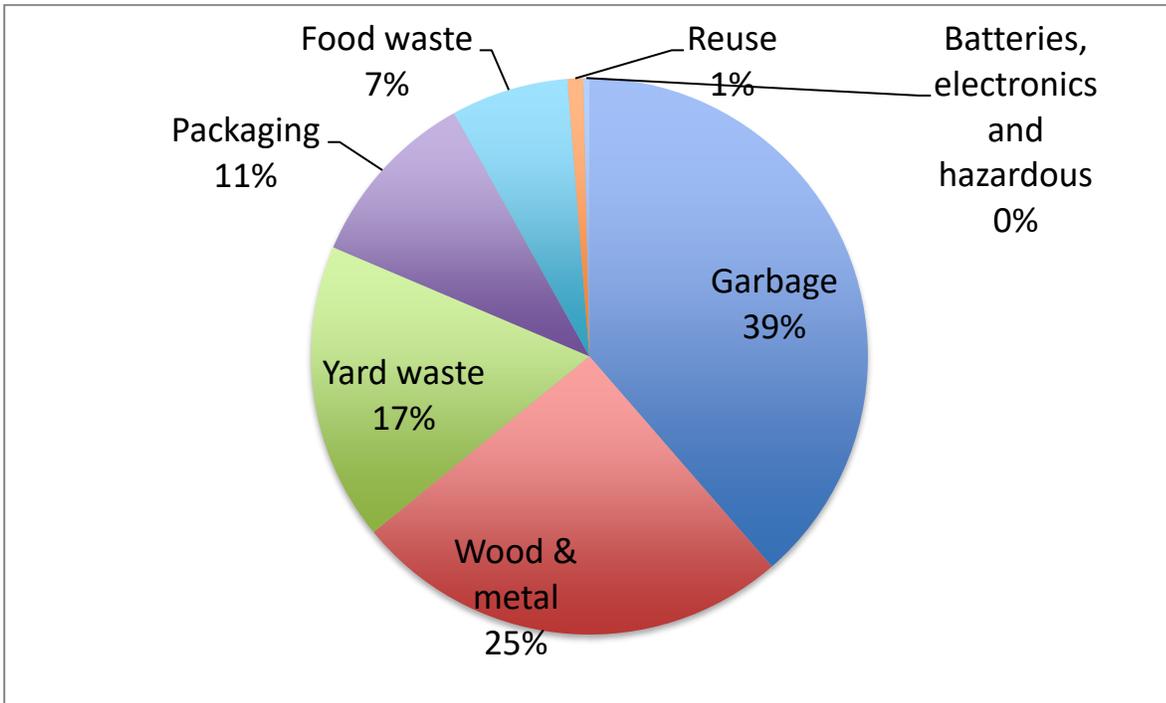


Figure 2 - Total Cost 2019

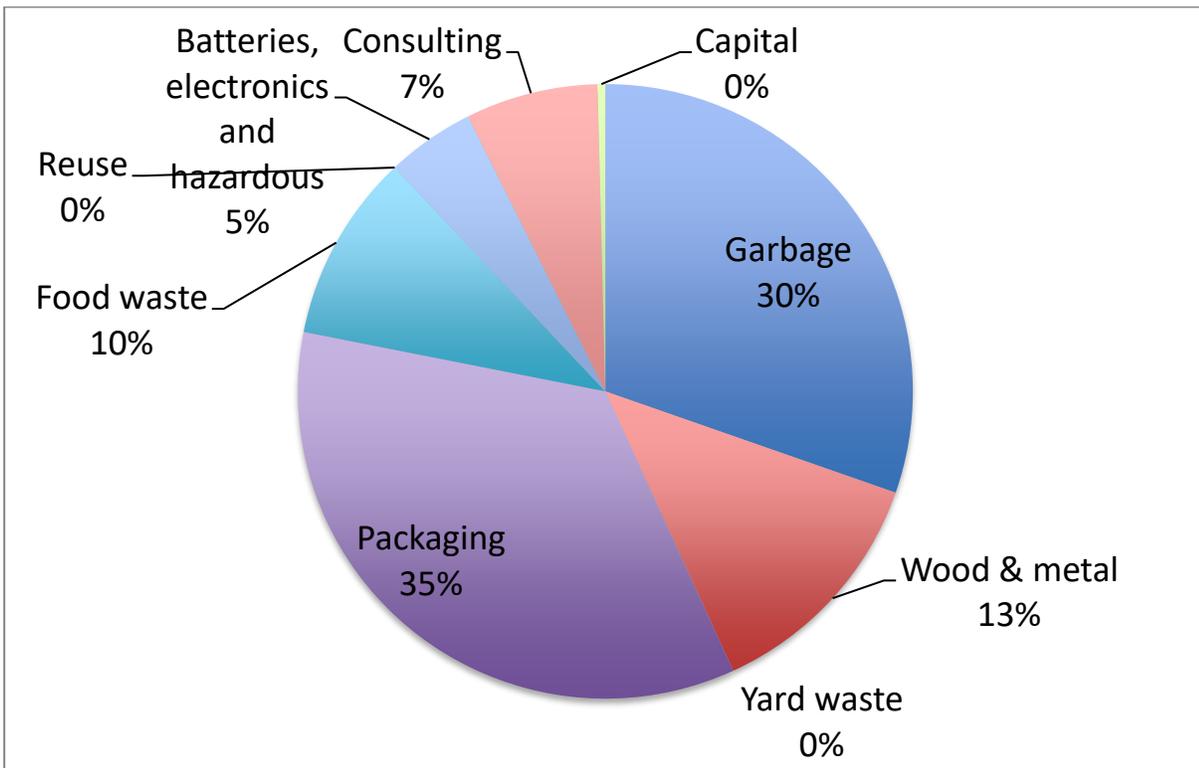


Figure 3 - Q4 Weights

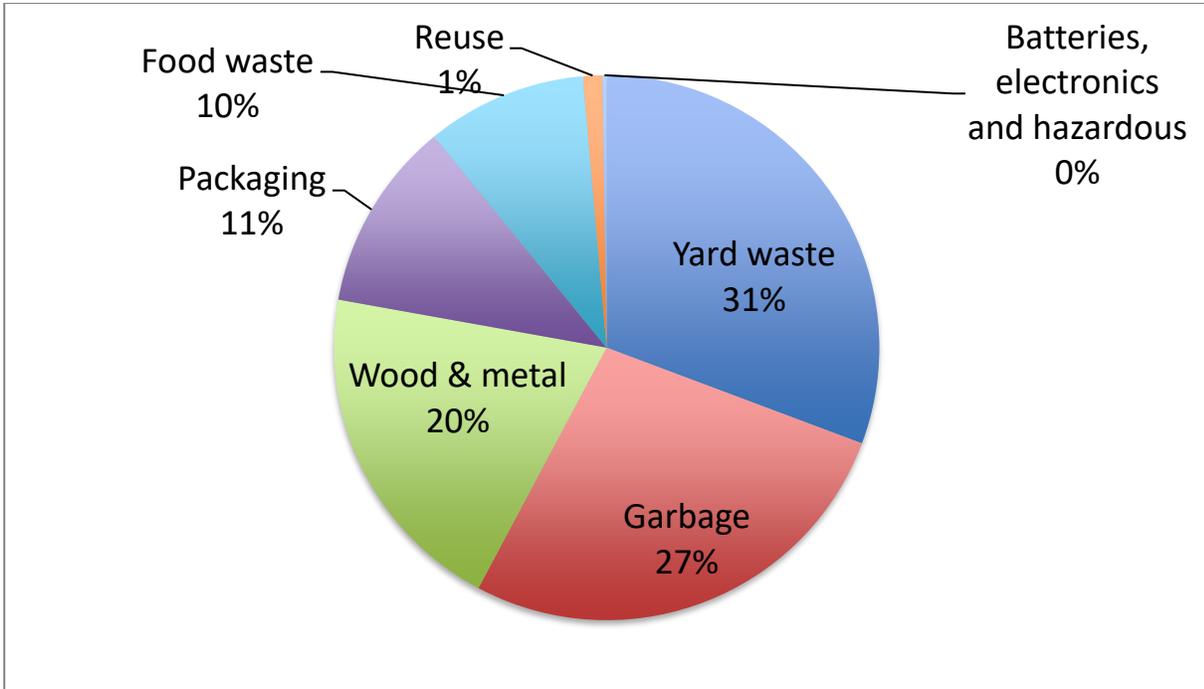


Figure 4 - Q4 Costs

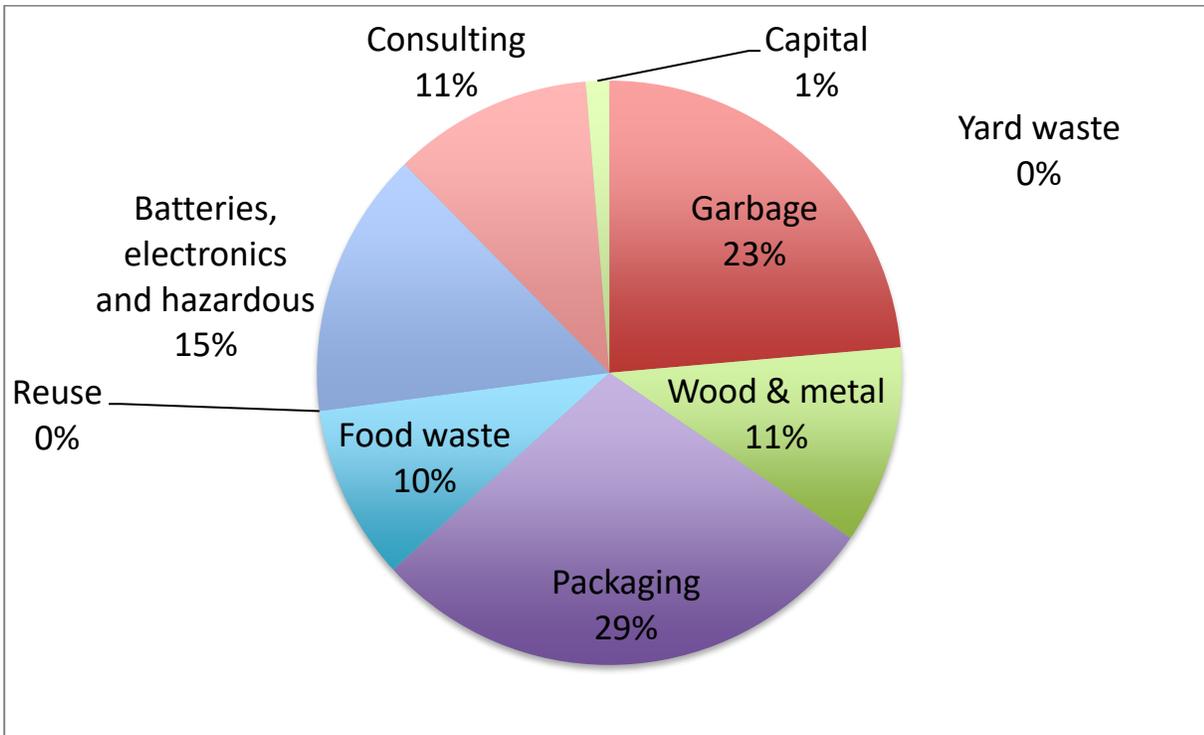


Figure 5 - Q3 Weights

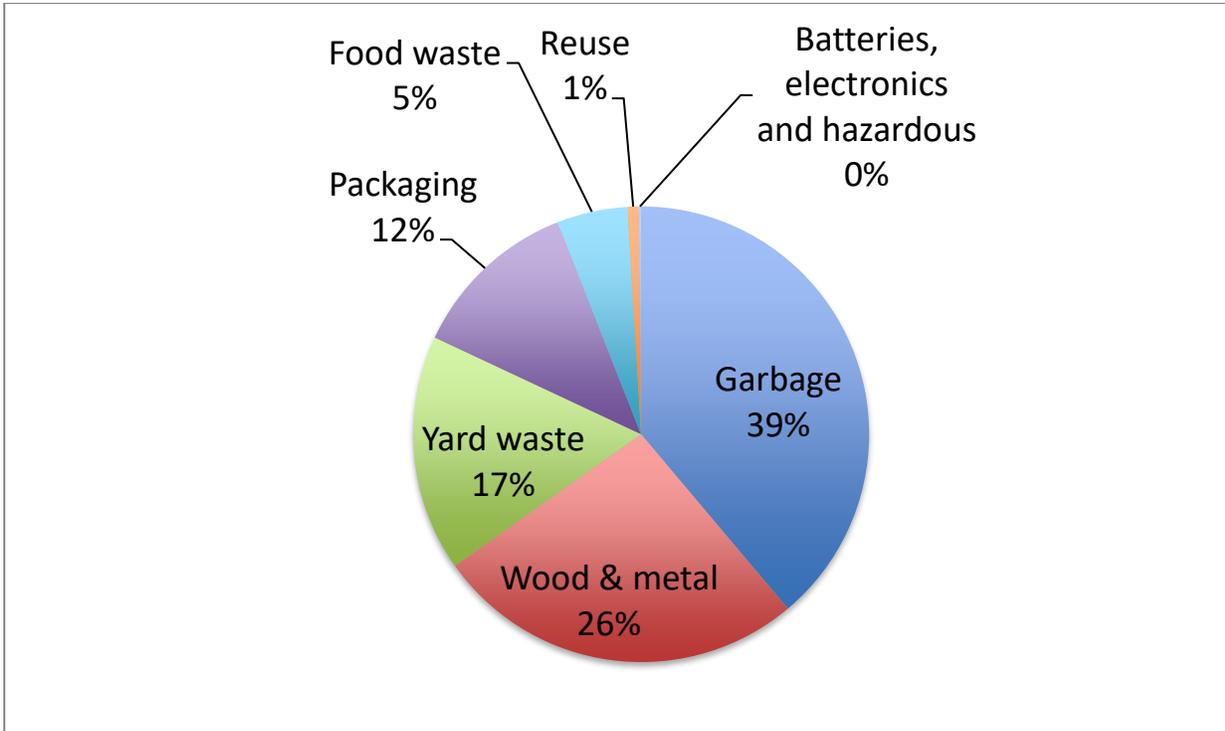


Figure 6 - Q3 Costs

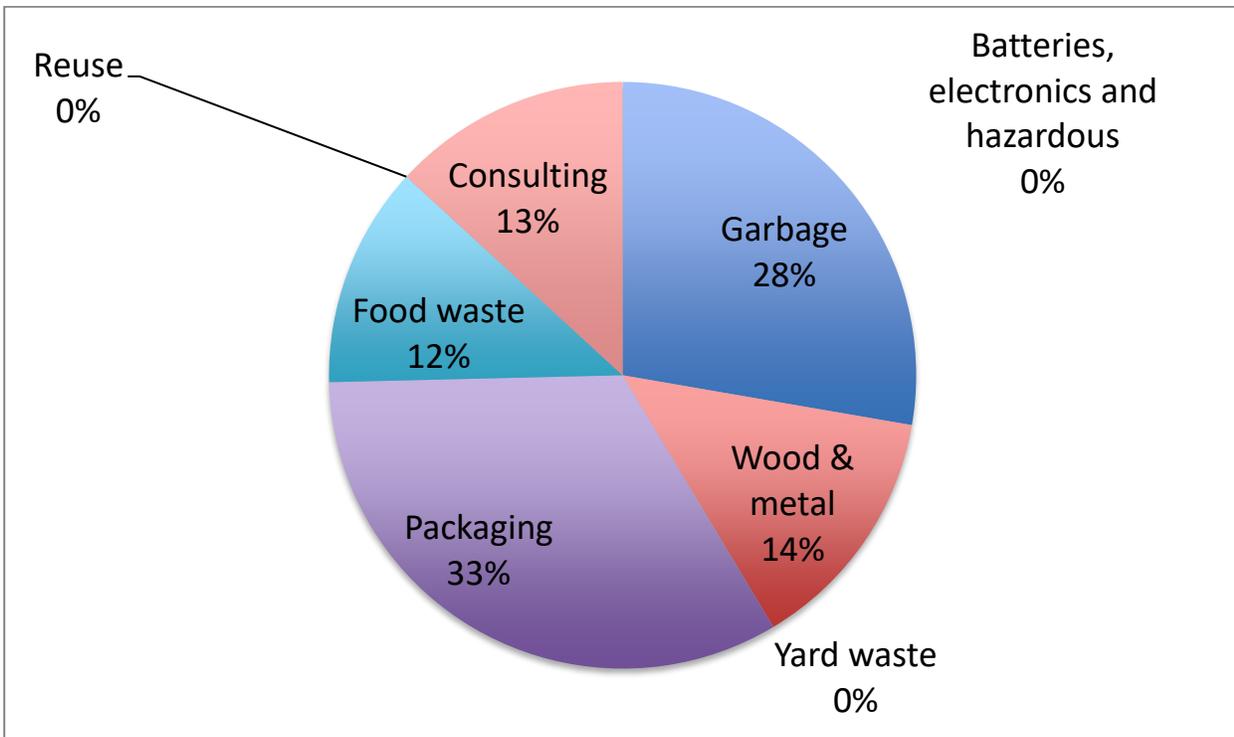


Figure 7 - Q2 Weights

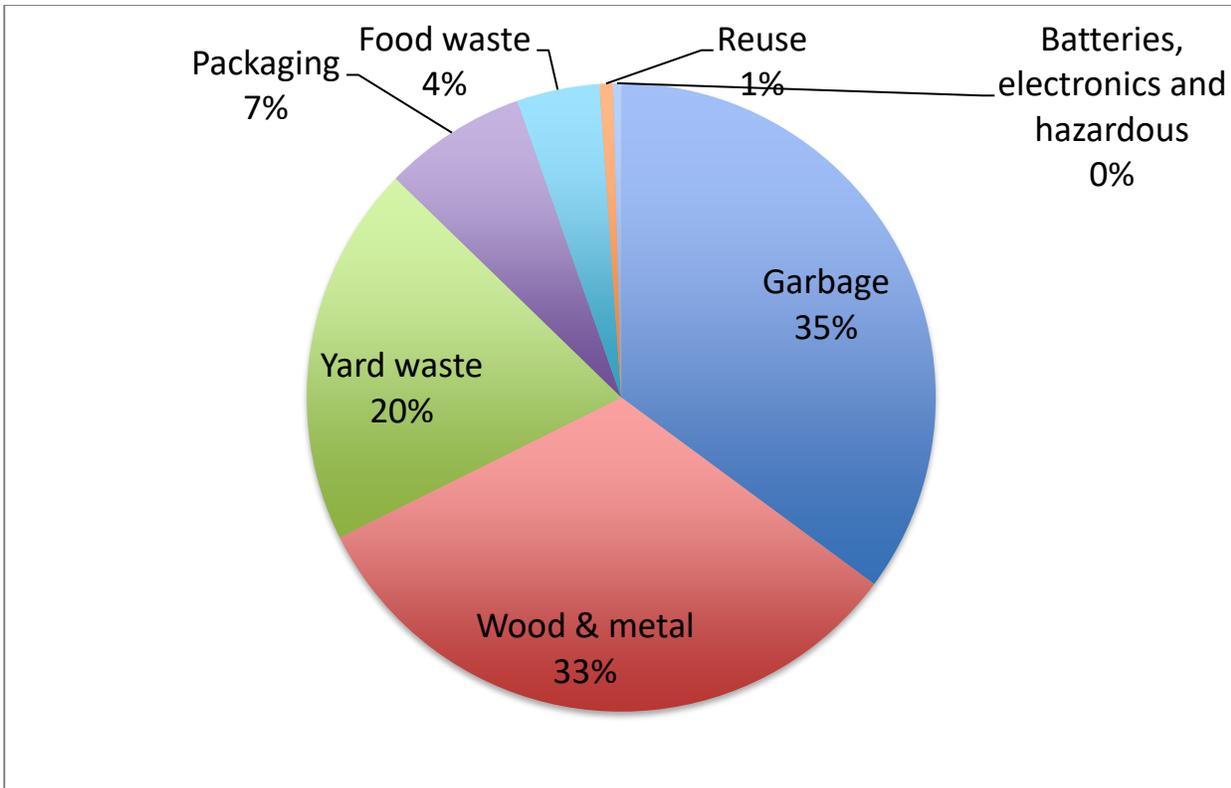


Figure 8 - Q2 Costs

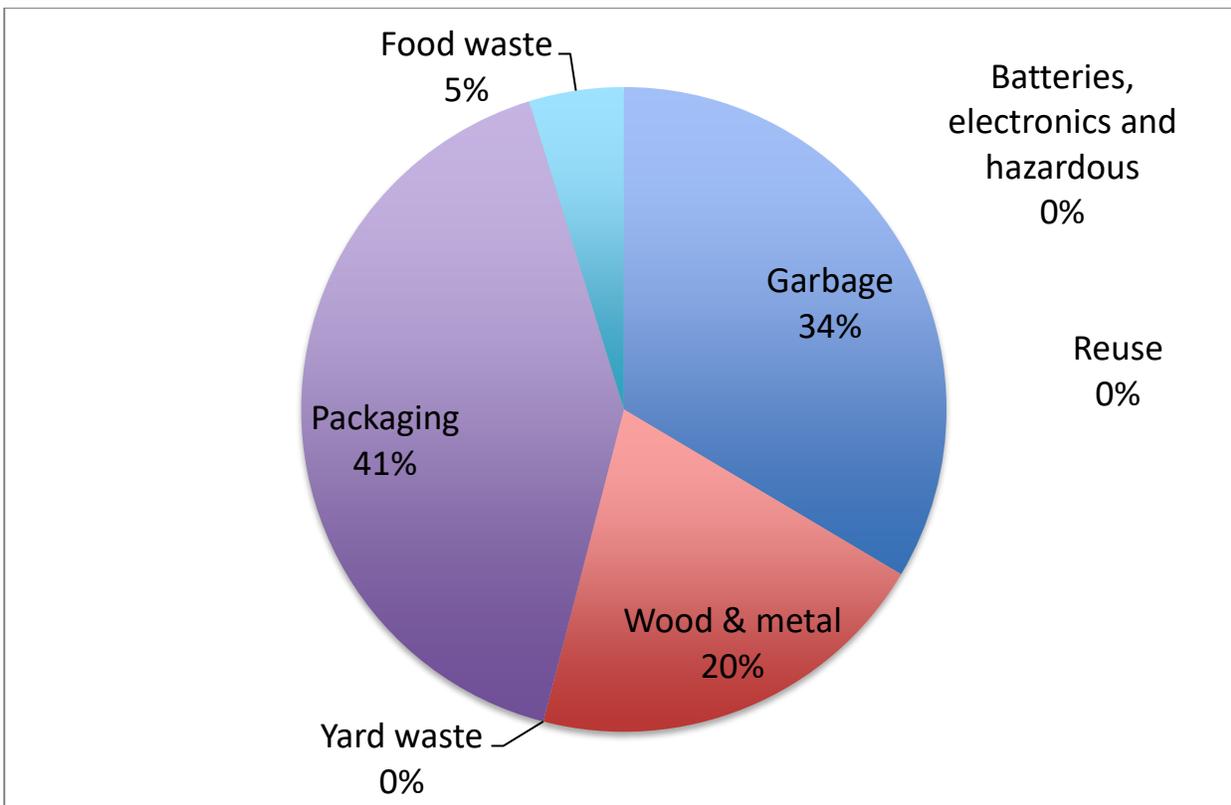


Figure 9 - Q1 Weights

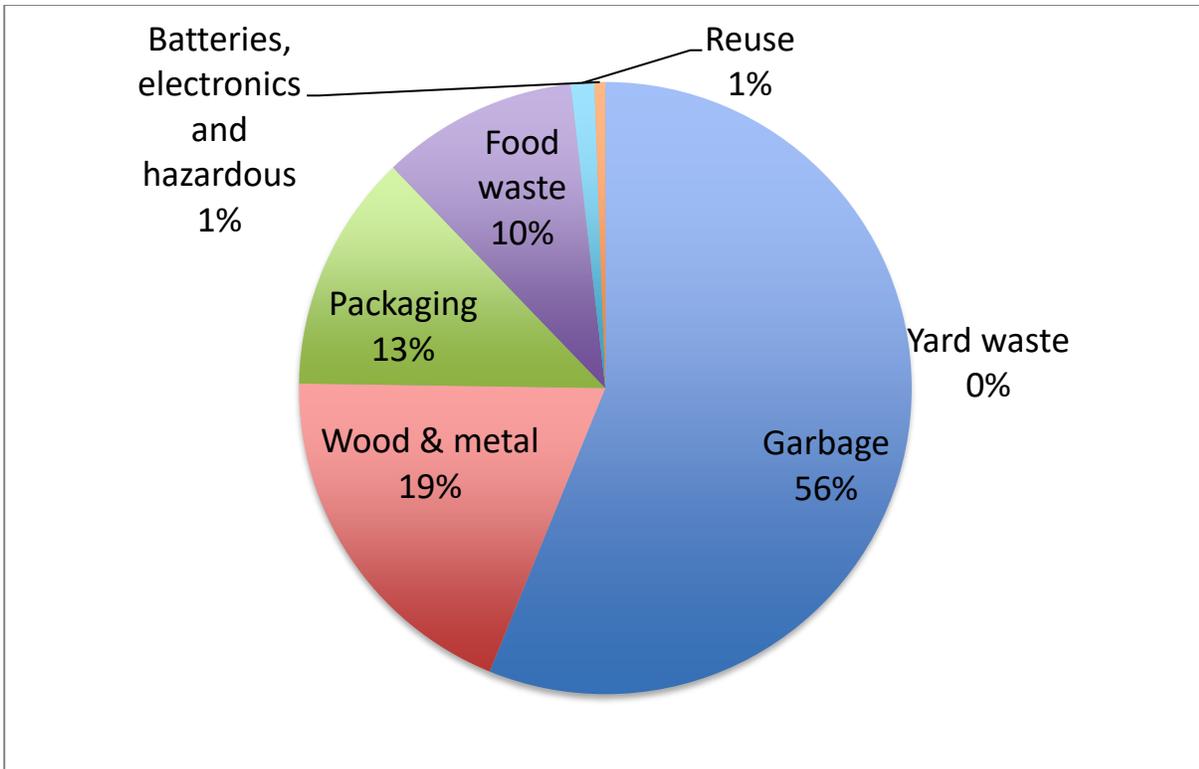


Figure 10 - Q1 Weights

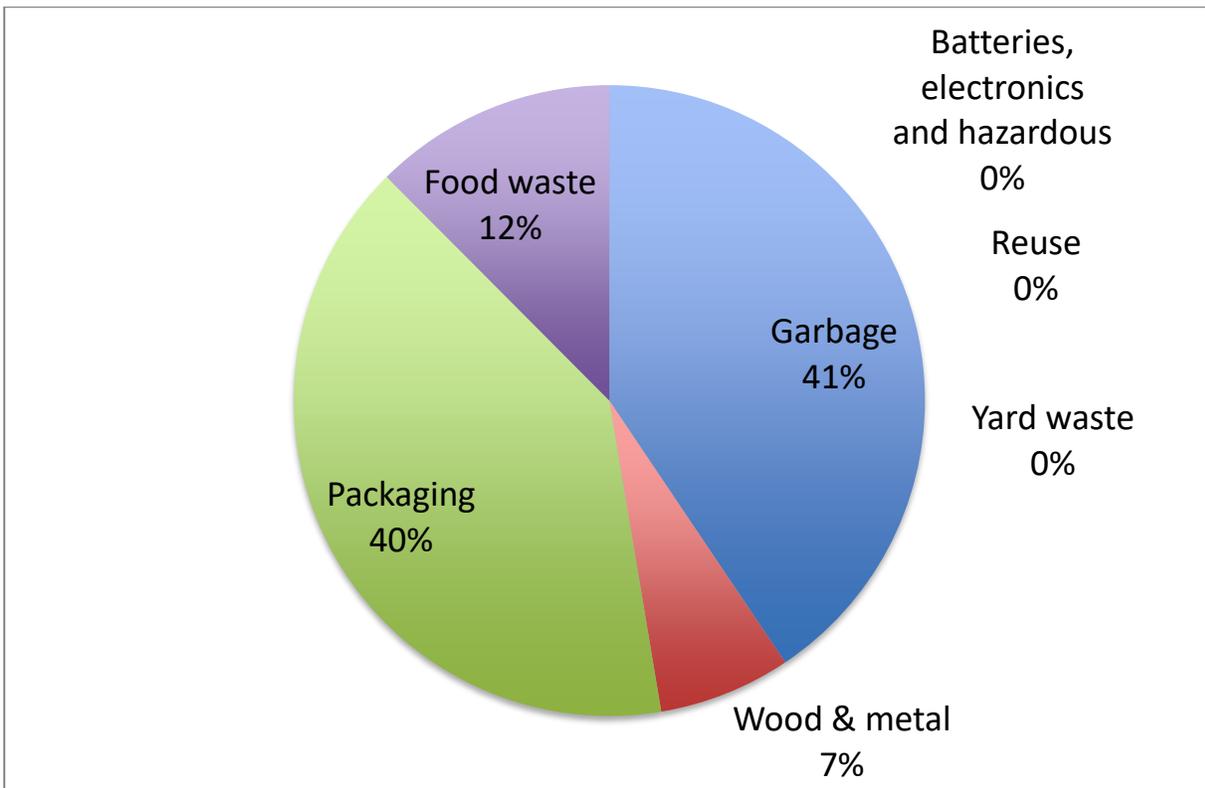


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1 Introduction

Background

Thompson Rivers University (TRU) has recognized the importance of leadership in environmental sustainability since making it a pillar of its Strategic Plan in 2007. Since adopting the strategic goal of becoming the 'University of Choice for Environmental Sustainability, TRU went on to create a department dedicated to improving campus sustainability. Through the TRU Sustainability Office, actions are continuously taken to increase campus sustainability.

In 2014, TRU adopted a goal of becoming a zero waste campus. To accomplish this goal, the Sustainability Office has implemented several waste reduction and diversion initiatives, such as diverting waste to composting, recycling and energy conversion. TRU collects and diverts a growing number of materials, and counts almost 20 separate waste streams. Since the previous audit, TRU has further expanded composting through the purchase and installation of a third in-vessel composter (The Rocket) at the Campus Activity Centre.

A waste audit performed in March 2018 showed that TRU diverted roughly 60% of waste generated on campus through recycling and composting programs, a slight reduction over the 2017 audit diversion rate of 64%. In 2018 approximately 643 tonnes of waste was generated, an increase from 519 tonnes in 2017.

Deliverables

The objectives of the audit are to provide TRU with the following information:

- Types and quantities of waste generated on campus; and
- Financial costs associated with waste handling, collection, and disposal.

Methodology and Assumptions

The data included in this report is based on actual records provided by TRU and its contractors as well as estimates based on limited actual records and/or historic estimations. Further details on data collection methodology are provided in the sections below for each waste stream.

2 Types of Waste

TRU diverts many types of waste generated on campus through reuse, recycling, composting and conversion to energy. The following section reports the quarterly diversion weights for 2019, and discusses the methods of diverting the many waste streams generated on campus.

Reuse

TRU has two reuse streams: textbooks and textiles (including small household items).

Textbooks

Textbooks are collected from the on-campus community, and the general public. A textbook collection bin is located outside the campus bookstore. Ancillary Services collects the books from the bins on an as-needed basis and donates them to a program called Textbooks For Change. Approximately five pallets of books are donated through the program on an annual basis. For more information about the program, visit Textbooks For Change website [here](#).

Below are the quarterly weights for textbook diversion. There is no cost to divert this waste stream. Weights for Q1 and Q2 are estimated based on an assumed weight per pallet of 1092 kg. Q3 and Q4 weights were reported based on an average weight per box of 45 lbs, with 72 boxes diverted in July and 68 boxes diverted in December. In 2019 TRU diverted nearly 6 tonnes of textbooks. There is no cost to divert this waste stream.

Table 2 - Textbooks

Period	Item	Month/Year	Weight (kg)	Cost (\$)
Q1-19	Textbooks	Jan-Mar 19	1356	\$-
Q2-19	Textbooks	Apr-Jun 19	1356	\$-
Q3-19	Textbooks	Jul-Sep 19	1473	\$-
Q4-19	Textbooks	Oct-Dec 19	1391	\$-
2019 Total	Textbooks	Jan-Dec 19	5594	\$-

Textiles and Household Items

In 2018, TRU partnered with Diabetes Canada to place two textile reuse and recycling bins on campus to help divert the usable items that make their way into the campus waste stream, such as clothing, shoes, books, office supplies, and other durable goods. The bins are placed outside the Daycare and the Old Main building. Weights are provided by Diabetes Canada on a monthly basis.

Below are the quarterly weights for textile diversion. Due to campus construction projects, the textiles bins were inaccessible and no weights reported for Q3. In 2019, TRU diverted 755 kg of textiles. There is no cost to divert this waste stream.

Table 3 - Textiles

Period	Item	Month/Year	Weight (kg)	Cost (\$)
Q1-19	Textiles	Jan-Mar 19	340	\$-
Q2-19	Textiles	Apr-Jun 19	120	\$-
Q3-19	Textiles	Jul-Sep 19	0	\$-
Q4-19	Textiles	Oct-Dec 19	295	\$-
YTD Total	Textiles	Jan-Dec 19	755	\$-

Food Waste Diversion

TRU diverts organic waste into several channels for composting or animal feed. The Culinary Arts and Meat Processing Departments send their scraps to local farmers. Yard waste from TRU grounds is sent to the Cinnamon Ridge Composting Facility. Food scraps and coffee grounds collected through zero waste stations and kitchens by TRU janitors are processed into compost in one of the three in-vessel onsite composters.

Feed Animals - Culinary Arts

The Culinary Arts (CA) program has historically sent their pre-consumer food scraps to local farmers for animal feed. In January 2019, the farmer collecting CA food scraps started using it to feed black soldier fly larvae, which are used as feedstock for ducks that are sold back to the CA program and local restaurants. The farmer did not initially weigh the material, but provided estimates based on the number of pickups and bins per pickup, which was in line with historic data; he has since started keeping more accurate weights of all pick-ups. The CA program runs from September until April.

Table 5 below shows aggregated total Food Waste for Q1 and Q2, which includes the weight of food scraps sent from the Culinary Arts Department to feed farm animals. No data for this waste stream was provided for the Q3 and Q4.

Feed Animals - Meat Trimmings and Bones

The Retail Meat Processing Program (RMP) began sending their meat trimmings and bones to a local dog breeder in 2016. The trimmings are stored in their fridge and collected on a weekly basis on Friday. The RMP program does not currently track data but they estimated approximately 273 kg per week. The RMP runs from September - June. Approximately 11 tonnes of meat scraps were diverted through this program in 2019. There is no cost to divert meat scraps.

Table 4 - Meat scraps

Period	Item	Month/Year	Weight (kg)	Cost (\$)
Q1-19	Meat scraps	Jan-Mar 19	3273	\$-
Q2-19	Meat scraps	Apr-Jun 19	2182	\$-
Q3-19	Meat scraps	Jul-Sep 19	1417	\$-
Q4-19	Meat scraps	Oct-Dec 19	4366	\$-
YTD Total	Meat scraps	Jan-Dec 19	11238	\$-

Compost – From Onsite Zero Waste Stations and Kitchens

TRU implemented onsite composting in 2014 with the purchase of a Jora 5100 in-vessel compost machine. In 2016, TRU expanded onsite-composting capacity with the purchase of a second Jora 5100, which began operating in 2017.

Onsite composting further expanded in 2017 with the acquisition of another in-vessel composter, The Rocket, which was installed outside the Campus Activity Centre. In February 2019, the two Joras were moved to a new location and have not been operating since. In April 2019, the farmer collecting food scraps from the CA also began collecting food scraps from the CAC.

Table 5 below shows the food waste totals. In 2019 TRU diverted approximately 29 tonnes of food waste. The total cost for collection by the farmer in 2019 was \$2600.00.

Table 5 - Food waste

Period	Item	Month/Year	Weight (kg)	Cost (\$)
Q1-19	Food waste	Jan-Mar 19	6813	\$100.00
Q2-19	Food waste	Apr-Jun 19	5500	\$387.50
Q3-19	Food waste	Jul-Sep 19	7995	\$925.00
Q4-19	Food waste	Oct-Dec 19	8705	\$925.00
YTD Total	Food waste	Jan-Dec 19	29013	\$2,600.00

Compost - Coffee Grounds

Historically, a TRU faculty member collected coffee grounds on a volunteer basis from the campus cafes to amend the soil on his farm. In January 2019, janitorial staff took over the operation of coffee ground collection from the campus cafes. Contractors provided weights for this waste stream for April, May and June, however January - March weights were estimated using historic data. Weights for Q3 and Q4 were included in the total food waste collected by the farmer.

The total cost to collect coffee grounds from campus cafes in 2019 was \$14,428.80.

Table 6 - Coffee grounds

Period	Item	Month/Year	Weight (kg)	Cost (\$)
Q1-19	Coffee grounds	Jan-Mar 19	3528	\$4,128.00
Q2-19	Coffee grounds	Apr-Jun 19	1059	\$1,344.00
Q3-19	Coffee grounds	Jul-Sep 19	(in food waste totals)	\$4,636.80
Q4-19	Coffee grounds	Oct-Dec 19	(in food waste totals)	\$4,320.00
YTD Total	Coffee grounds	Jan-Dec 19	4587	\$14,428.80

Compost - Yard Waste

The largest source of organic waste comes from maintaining the campus grounds. The head of the TRU Grounds crew estimated 500 loads of yard waste brought to the Bunker Road Yard Waste site over a year. Each load is estimated at 227 kilograms, based on an average estimated by the head of the grounds based on a series of loads weighed on a nearby scale.

Table 7 below shows the total yard waste diverted in 2019 was approximately 119 tonnes. There is no cost to divert this waste stream.

Table 7 - Yard waste

Period	Item	Month/Year	Weight (kg)	Cost (\$)
Q1-19	Yard waste	Jan-Mar 19	0	\$-
Q2-19	Yard waste	Apr-Jun 19	42564	\$-
Q3-19	Yard waste	Jul-Sep 19	31387	\$-
Q4-19	Yard waste	Oct-Dec 19	45225	\$-
YTD Total	Yard waste	Jan-Dec 19	119176	\$-

Recycling

TRU diverts a number of waste materials through recycling. Trades and Technology Department and Facilities Services generate scrap metal. Scrap wood is also heavily recycled, with collection bins at the Warehouse and the Trades and Technology department. Mixed recycling and refundable beverage containers are collected across campus in zero waste stations. Cardboard is mostly generated by staff and recycled in bins outside, and also collected in carts. There are also bins to collect batteries, Styrofoam, and plastic bags in all buildings, as well as electronics recycling bins in two buildings (Old Main and CAC).

Recycling - Scrap Metal Trades & Facilities Services

Scrap metal is collected in the trades and facilities areas. The Trades and Technology Department has had a scrap metal recycling program through Richmond Steel for many years and uses several bins to sort different types of metals, for which they are compensated. In 2017, the TRU Sustainability Office placed a mixed scrap metal bin at Facilities Services. The cost for the metal bin includes bin rental and hauling. The bin is hauled to Mission Flats Landfill and put in the scrap metal pile.

TRU diverted over 122 tonnes of scrap metal in 2019, which cost \$4000.00. The revenue from scrap metal is not included in the total cost.

Table 8 - Scrap metal

Period	Item	Month/Year	Weight (kg)	Cost (\$)
Q1-19	Scrap metal	Jan-Mar 19	22529	\$940.00
Q2-19	Scrap metal	Apr-Jun 19	42741	\$1420.00
Q3-19	Scrap metal	Jul-Sep 19	38769	\$875.00
Q4-19	Scrap metal	Oct-Dec 19	18025	\$765.00
YTD Total	Scrap metal	Jan-Dec 19	122064	\$3,235.00

Recycling - Mixed Recycling

Mixed (co-mingled) recycling includes paper and packaging materials (plastic, paper, metal). Mixed recycling is collected across campus from zero waste stations and directly placed into recycling carts from offices, cafes, kitchens, and occasionally from events. Janitors are responsible for placing mixed recycling from the zero waste stations into 245-litre recycling carts distributed across campus. Carts are placed at the curb on a weekly basis by staff and contractors. Mixed recycling is also collected in a 6-yard bin outside the Campus Activity Centre (previously only collecting cardboard).

In January 2018, the world recycling markets were highly impacted by what is known as China's National Sword, a policy by the Chinese government which limited and then later stopped imports of foreign waste. This disruption has caused a great shift towards prioritizing reduced contamination in mixed recycling around the world. TRU's mixed recycling waste stream, specifically material collected from zero waste stations has shown high contamination rates, upwards of 50%. As a result, in December 2018 TRU employed a contractor to sort zero waste station material prior to collection.

Data presented in the table below was provided by TRU and based on measurements taken by contract staff for sorted recycling carts. Weights were adjusted to account for the number of carts tipped not accounted for by the sorting contractor based on records provided by the hauler for Q1 and Q2.

Q3 weights were provided by contract staff and include total sorted recycling set out for collection. Cost data presented includes both sorting contract and collection costs for the City and Waste Connections. There was a significant increase in the amount of recycling in Q3 due to improved sorting. Data for the mixed recycling bin behind the CAC was estimated by Waste Connections and includes a significant amount of cardboard.

TRU diverted approximately 38 tonnes of mixed recycling in 2019. Total cost for mixed recycling was \$53,614.28 comprising of \$43,344.00 for sorting, \$3659.68

for collection of the Waste Connections bin and \$6610.60 for collection of the City carts.

Table 9 - Mixed recycling

Period	Item	Month/Year	Weight (kg)	Cost (\$)
Q1-19	Mixed recycling	Jan-Mar 19	7764	\$13,279.40
Q2-19	Mixed recycling	Apr-Jun 19	7199	\$13,279.40
Q3-19	Mixed recycling	Jul-Sep 19	14552	\$13,317.90
Q4-19	Mixed recycling	Oct-Dec 19	8644	\$13,737.58
YTD Total	Mixed recycling	Jan-Dec 19	38159	\$53,614.28

Recycling - Cardboard

Cardboard is collected in four and six yard bins outside five buildings on campus. Cardboard is placed in bins by staff and contractors. Cardboard was measured over a one-week period by the hauler in Q2 and Q3. Weights for Q4 were not measured and assumed to be. Cost data for cardboard collection was in utility statement transactions provided by City staff.

TRU purchased and installed a baler. In Q4 TRU began baling cardboard. Over the three-month period TRU baled two 500 kg bales of cardboard.

Table 10 below shows a summary of cost and estimated weights for cardboard diversion. In 2019 TRU diverted an estimated 21 tonnes of cardboard at a cost of \$5605.05.

Table 10 - Cardboard recycling

Period	Item	Month/Year	Weight (kg)	Cost (\$)
Q1-19	Cardboard	Jan-Mar 19	7872	\$932.85
Q2-19	Cardboard	Apr-Jun 19	7056	\$1557.40
Q3-19	Cardboard	Jul-Sep 19	6240	\$1557.40
Q4-19	Cardboard	Oct-Dec 19	6240	\$1557.40
YTD Total	Cardboard	Jan-Dec 19	21188	\$5605.05

Recycling - Refund Beverage Containers

A special autism program class from Kamloops School of the Arts is responsible for collecting and recycling refundable beverage containers as part of their class curriculum. The students and staff collect beverage containers from zero waste stations, twice per week. In 2017 the group began collecting from Ancillary Services for event waste as well.

Data is not collected for this waste stream. Estimates presented in Table 11 below for Q1-Q3 are based on historic data. TRU diverted about 6600 kg of refund beverage containers in 2019. There is no cost for this waste stream.

Table 11 - Refundable beverage containers

Period	Item	Month/Year	Weight (kg)	Cost (\$)
Q1-19	Refund containers	Jan-Mar 19	1644	\$-
Q2-19	Refund containers	Apr-Jun 19	1644	\$-
Q3-19	Refund containers	Jul-Sep 19	1644	\$-
Q4-19	Refund containers	Oct-Dec 19	1664	\$-
YTD Total	Refund containers	Jan-Dec 19	6576	\$-

Recycling - Plastic Bags & Overwrap

In September 2017, TRU removed the bins for plastic bags from the other bins of the zero waste stations. This was done due to heavy contamination of the plastic bag bins. Once done, the contamination of these bins has improved to almost zero percent, according to TRU staff. TRU janitors collect the plastic bags monthly or as needed and brought to the Warehouse where it is stored until sufficient volume is amassed, at which time a truck from the Lorne Street Bottle Depot collects it for transport to the Lower Mainland for final recycling.. Data for the plastic bags waste stream is based on an average weight per bag of 3 kg, with one bag of bags recycled each month. Costs for plastic bag are from collection by the janitors.

TRU diverted 33 kg of plastic bags in 2019. The cost to collect bags was \$482.00.

Table 12 - Plastic bag recycling

Period	Item	Month/Year	Weight (kg)	Cost (\$)
Q1-19	Plastic bag	Jan-Mar 19	9	\$136.00
Q2-19	Plastic bag	Apr-Jun 19	9	\$88.00
Q3-19	Plastic bag	Jul-Sep 19	9	\$126.00
Q4-19	Plastic bag	Oct-Dec 19	6	\$132.00
YTD Total	Plastic bag	Jan-Dec 19	33	\$482.00

Recycling - Styrofoam

TRU began recycling Styrofoam in 2016. It's collected in bright yellow totes in key buildings around campus and then the janitorial or Facilities staff brings it to the Warehouse where its final life mirrors that of Styrofoam (mentioned above). Data for Styrofoam recycling is based on an average weight per bag of 1 kg,

with an estimated 16 bags recycled per month. Costs for Styrofoam are from collection by the janitors.

TRU diverted 231 kg of Styrofoam in 2019. The cost to collect foam was \$482.00.

Table 13 - Styrofoam recycling

Period	Item	Month/Year	Weight (kg)	Cost (\$)
Q1-19	Styrofoam	Jan-Mar 19	48	\$136.00
Q2-19	Styrofoam	Apr-Jun 19	48	\$88.00
Q3-19	Styrofoam	Jul-Sep 19	77	\$126.00
Q4-19	Styrofoam	Oct-Dec 19	58	\$132.00
YTD Total	Styrofoam	Jan-Dec 19	231	\$482.00

Recycling - Batteries

Batteries are collected in 13 bins across all major buildings on campus. Batteries are emptied on a monthly (or so) basis by Facilities Services. Call2Recycle collects the batteries and sends reports with details of the types of batteries and total weights. The following table details the weights for collection of batteries, there is no cost for collection.

TRU diverted 172 kg of batteries in 2019. There is no cost to divert this stream.

Table 14 - Battery recycling

Period	Item	Month/Year	Weight (kg)	Cost (\$)
Q1-19	Battery	Jan-Mar 19	0	\$-
Q2-19	Battery	Apr-Jun 19	32	\$-
Q3-19	Battery	Jul-Sep 19	71	\$-
Q4-19	Battery	Oct-Dec 19	69	\$-
YTD Total	Battery	Jan-Dec 19	172	\$-

Recycling - Electronics

In 2017, TRU partnered with the Electronics Recycling Association (ERA) to recycle the e-waste from campus. ERA set up two collection bins, one in the Campus Activity Centre and the other in the Old Main building. ERA also picks up TRU's e-waste that is collected by Facilities Services and brought to the Warehouse for storage until sufficient volume requires an ERA truck to collect it. ERA provides certificates with descriptions and weights for material recycled through the program.

Data presented in the table below represents weights provided by the ERA. There is no cost for this waste stream. TRU diverted 1234 kg of electronics in 2019.

Table 15 - Electronics recycling

Period	Item	Month/Year	Weight (kg)	Cost (\$)
Q1-19	Electronics	Jan-Mar 19	601	\$-
Q2-19	Electronics	Apr-Jun 19	405	\$-
Q3-19	Electronics	Jul-Sep 19	228	\$-
Q4-19	Electronics	Oct-Dec 19	0	\$-
YTD Total	Electronics	Jan-Dec 19	1234	\$-

Converted to Energy

Several waste streams are converted to energy or incinerated, which includes wood waste and hazardous waste.

Wood Waste

In September 2016, the Sustainability Office placed a wood-recycling bin outside Facilities Services building, increasing the weekly recycling rate for diversion in 2017. In 2018, TRU further expanded the wood-collection program, sourcing woodbins for the Theatre and Fines Arts programs to fill at three or four times throughout the year (after each production performance).

In September 2019, a wood waste was placed at the trades building, at which time one of the garbage dumpsters was removed. The hauler, Norewest Concrete, takes the wood to Mission Flats Landfill where it is chipped and sent to electricity co-generation plants in B.C. The hauler provides cost and weight data for wood waste, as presented in the table below.

TRU diverted 42 tonnes of wood waste in 2019 at a cost of \$18,086.51, which includes hauling, bin rentals. Disposal fees are included in the hauling costs (costs don't vary with the amount of wood waste disposed).

Table 16 - Wood waste diversion

Period	Item	Month/Year	Weight (kg)	Cost (\$)
Q1-19	Wood waste	Jan-Mar 19	3775	\$1504.00
Q2-19	Wood waste	Apr-Jun 19	27791	\$6037.50
Q3-19	Wood waste	Jul-Sep 19	10500	\$5364.36
Q4-19	Wood waste	Oct-Dec 19	11466	\$5180.65
YTD Total	Wood waste	Jan-Dec 19	42066	\$18,086.51

Cooking Oil

The Culinary Arts building and the Campus Activity Centre kitchens collect used cooking oil. The oil is collected by McLeod's Byproducts in Armstrong and is used to make animal feed. The hauler provided weights for each collection. There are no costs for this waste stream. A total of 2163 kg of cooking oil was diverted from TRU in 2019.

Table 17 - Cooking oil diversion

Period	Item	Month/Year	Weight (kg)	Cost (\$)
Q1-19	Cooking oil	Jan-Mar 19	704	\$-
Q2-19	Cooking oil	Apr-Jun 19	539	\$-
Q3-19	Cooking oil	Jul-Sep 19	0	\$-
Q4-19	Cooking oil	Oct-Dec 19	940	
YTD Total	Cooking oil	Jan-Dec 19	2163	\$-

Hazardous Waste

The TRU Safety Office manages the hazardous waste generated through various departments (trades, campus medical centre, and labs). Data provided in this report was provided on hazardous waste manifests. The liquids from the manifests recorded in volumes were converted to weights on a one to one ratio of litres to kilograms. Cost data was provided for Q4, with a total of \$8000. TRU diverted 962 kg of hazardous waste in 2019.

Table 18 - Hazardous waste diversion

Period	Item	Month/Year	Weight (kg)	Cost (\$)
Q1-19	Hazardous waste	Jan-Mar 19	187	\$-
Q2-19	Hazardous waste	Apr-Jun 19	480	\$-
Q3-19	Hazardous waste	Jul-Sep 19	0	\$-
Q4-19	Hazardous waste	Oct-Dec 19	295	\$8000.00
YTD Total	Hazardous waste	Jan-Dec 19	962	\$8000.00

Landfill

Landfill waste consists of material not diverted from the waste stream. The City of Kamloops and Waste Connections collects landfill waste from bins across campus on a daily basis. Data for the weights of city collection was measured over a one-week period. City costs were provided with utility statement reports.

Waste Connections collects landfill waste in one bin located at the CAC. Weights for this bin are estimated based on a volume to weight conversion factor of 161 kg/cu.y. In Q3, a wood bin hauled by Noremac was contaminated and therefore charged the mixed DLC rate and had to be landfilled.

The table below shows quarterly data for City collection, Waste Connections collection, and for the contaminated wood bin. The costs include bin rental, hauling and extra tips. Disposal fees are included in hauling costs.

TRU landfilled approximately 266 tonnes of waste in 2019. 218 tonnes was collected by the City and 47 tonnes collected by Waste Connections. The total cost for landfilling in 2019 was \$51,724.71 - approximately \$42,000 for City collection and \$9000 for Waste Connections collection.

Table 19 - Landfilled

Period	Item	Month/Year	Weight (kg)	Cost (\$)
Q1-19	Landfill - City	Jan-Mar 19	80418	\$12,285.21
Q1-19	Landfill - Waste Connections	Jan-Mar 19	10143	\$2,348.04
Q2-19	Landfill - City	Apr-Jun 19	73443	\$9,868.04
Q2-19	Landfill - Waste Connections	Apr-Jun 19	10143	\$2,348.04
Q3-19	Landfill - City	Jul-Sep 19	62040	\$9,942.30
Q3-19	Landfill - Waste Connections	Jul-Sep 19	10143	\$2,386.54
Q3-19	Landfill - DLC (wood bin)	Jul-Sep 19	530	\$300.00
Q4-19	Landfill - City	Oct-Dec 19	28920	\$9898.50
Q4-19	Landfill - Waste Connections	Oct-Dec 19	10948	\$2348.04
YTD	Landfill - City	Jan-Dec 19	218820	\$41,994.05
YTD	Landfill - Waste Connections	Jan-Dec 19	46883	\$9430.66
YTD	Landfill - DLC (wood bin)	Jan-Dec 19	530	\$300
YTD	Landfill - Total	Jan-Dec 19	266233	\$51,724.71

3 Recommendations

While the scope of this report was only to summarize and report data for waste streams on campus, staff requested some basic recommendations to help guide future initiatives. The following recommendations are from previous waste audit reports.

Source /target audience	Policy	Outreach	Infrastructure
Zero waste stations / students		<ul style="list-style-type: none"> - Waste station ambassadors at events and in classes - Educate international students about waste management in BC/ Kamloops/ TRU 	<ul style="list-style-type: none"> - 3D signage in each building
Trades / trades administration		<ul style="list-style-type: none"> - Why source separating DLC waste matters - Promote/ encourage lessons in deconstruction 	<ul style="list-style-type: none"> - Investigate diversion of sawdust bin
Offices / staff and administration	<ul style="list-style-type: none"> - ‘Kick the can’ - staff are responsible for taking waste to central collection 	<ul style="list-style-type: none"> - ‘What goes where’ - short video clips or presentations to staff and administration 	<ul style="list-style-type: none"> - Centralized zero waste stations in offices - Remove garbage bins from desks and provide recycling bins as required
Kitchen & Café / Aramark	<ul style="list-style-type: none"> - Include language in new contracts for waste diversion targets - Create incentives or penalties for target thresholds 	<ul style="list-style-type: none"> - Training contract staff on ‘what goes where’ - Presentations to contract staff (staff meetings) on “what goes where and why” - Encourage Scratch Café to become a Zero Waste Kitchen 	<ul style="list-style-type: none"> - Engage and support contract staff to set up internal waste diversion systems - Student food band
Stores / Facility staff and administration		<ul style="list-style-type: none"> - Why waste matters presentation to staff - Host repair cafes in partnership with local repair café group 	