TRU ZERO WASTE PLAN (2022-2027)

THOMPSON RIVERS UNIVERSITY

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Executive Summary

TRU aspires to be a global leader in zero-waste, demonstrating alternative approaches to the common linear 'take, make, waste' paradigm by implementing systems and processes that are more in line with a circular 'reduce, reuse, repair' paradigm. The planet cannot sustain a linear system. Throwing things 'away' needs to be a concept of the past. By shifting to circular systems, TRU is working towards zero-waste, commonly defined as achieving 95% diversion from landfill. This five-year plan (2022-2027) is an important steppingstone towards that goal.

This plan was commissioned in 2021 to guide TRU to a goal of 95% waste diversion within five years. The development of this plan included engagement with key stakeholders to ensure that the plan initiatives were supported by the individuals and departments responsible for plan implementation. Stakeholder engagement in 2022 was integral to the development of this plan. It identified barriers and opportunities for plan implementation. A draft was presented to TRU representatives, and surveys following presentations on the plan concepts showed strong support for the initiatives presented in the plan.

Waste Naught BC was engaged as the primary consultant to develop the plan, with additional consulting support from Tamara Shulman and Associates for her expertise and experience in waste management planning, and Jennifer Muir for her expertise in community engagement.

Since starting its Zero Waste Program in 2013, TRU has taken significant steps in building the foundation to work towards this goal. The campus now has over 110 indoor zero waste stations and almost 20 outdoor stations; there is a Zero Waste Subcommittee; regular waste audits take place to verify program objectives; and TRU has many passionate and dedicated students, staff and faculty members who want to realize a zero-waste future on campus.

Zero waste is supported at campus, municipal, regional, provincial and federal levels through plans, policies and regulations. Sustainability is a core value and key priority of the Campus Strategic Plan, the Campus Strategic Sustainability Plan, and the campus Sustainable Purchasing Guide. Municipal and regional plans set targets for waste reduction at the community-level, with the City of Kamloops' Community Climate Action Plan adopted in 2021 including an area of focus on Zero Waste and the Circular Economy. Provincial and federal plans, policies and regulations, in place and emerging, support and amplify TRU's efforts towards a zero waste future.

TRU has well-established programs supporting zero waste within the campus operations sector, with waste diversion and reduction programs, as well as education and behaviour change programs targeted for many types of waste. Governance and oversight through the Environmental Sustainability Advisory Committee (ESAC) and Zero-Waste Subcommittee of the ESAC are established and provide a foundation to support implementation of plan initiatives. Campus construction and renovation and campus housing sectors are less well-established, and specific governance and oversight structures in these sectors will help with plan implementation in these areas.

Characterization of campus waste in the operations sector includes historical data of waste generation from 2015 to present. Due to the impacts of COVID-19, data from 2020 and 2021 was not used in establishing baseline data or developing targets, as waste generation during this time was believed to be significantly different than normal. Waste composition data provides quantifiable metrics from which to evaluate performance. The 2018 audit of campus operations shows opportunities for waste diversion and reduction. A

2021 audit of campus residences was performed, however further tracking and performance monitoring are required to better understand waste generation in this sector. Tracking and performance measuring is also required for the campus construction and renovation sector.

This plan uses the Zero Waste International Alliance's Zero Waste Hierarchy as a framework for the recommended initiatives, with food waste and single-use items representing the areas of greatest opportunity for waste avoidance in operations and housing. Improving waste diversion of current programs through communication and behaviour change tools, as well as implementing new programs to divert waste will lead to increased capture and diversion of waste. Construction and renovation plan initiatives include waste prevention and diversion strategies.

The proposed targets for campus operations are set using baseline waste disposal and composition data, with a short-term objective of 50% reduction in garbage disposed from a baseline level of 200 tonnes per year (TPY) for the 2015 – 2017 period to 100 TPY by 2027. The long-term goal is to reach zero waste (a 95% diversion) by 2035. Further data is required to integrate housing and construction into baseline metrics, however the overall goal is a 50% reduction in the baseline level over a five-year period.

Many examples of successful programs in campuses, businesses and communities across Canada and the US are shared within this plan, as well as tools and best practice documents that can help with implementation of the proposed initiatives.

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Tables and Figures

1 Scope

TRU has set an aspirational goal of becoming a zero-waste campus, which is to achieve a 95% diversion rate. This plan is intended for the Kamloops campus; however, the concepts could also be applied to the Williams Lake campus. This plan sets the pathway to becoming a zero-waste campus across three waste sectors of campus: operations, construction and renovation, and residences (North Tower, McGill Housing, East Village, and future residences).

Stakeholders across the three sectors of campus play integral roles with respect to waste generation and waste management. Through the development of this plan, the following roles within campus have been engaged with at various stages to help inform the plan and priority actions.

Table 1-1 - Key Stakeholders for Campus Waste Sectors

Operations	Construction & Renovation	Housing
Janitorial Contractor TRU Facility Services TRU Sustainability Office TRU Procurement Services TRU Ancillary Services TRU Food Services TRU IT Department TRU Student Union TRU Grounds/ Horticulture (and associated contractors) TRU Marketing and Communications Culinary Arts Department Trades Department Visual Arts Department Theatre Arts Department Animal Health Department	TRU Campus Infrastructure TRU Facilities Services TRU Utilities Third-party contractors TRU Sustainability Office TRU Marketing and Communications	TRU Ancillary Services TRU Housing Third-party contractor for North Tower (Campus Living Centres) Building maintenance personnel TRU Sustainability Office TRU Marketing and Communications

2 Background

2.1 Zero Waste Models

There are two models that provide frameworks from which to apply zero waste principles: the waste hierarchy and the circular economic model. The circular economic model is a systematic and holistic approach to economic development and is by design, restorative and regenerative, based on principles of designing waste

and pollution out, keeping products and materials in use, and regenerating natural systems. [1] This approach involves designing systems which eliminate waste out, where one set of activity's outputs (waste) are another's inputs (resource).

This plan uses the waste hierarchy framework, which prioritizes waste management practices from the most preferred to the least preferred to maximize benefits of material use, with waste prevention practices having the greatest benefits, followed by reduction, reuse and repair, recycling, chemical and energy recovery, with disposal being the least preferred choice for material management.

Figure 2-1 - Zero Waste International Alliance Waste Hierarchy Framework

2.2 Supporting Policies and Plans

Plans and policies at the campus, municipal, regional, provincial and federal level support TRU's goal of becoming a zero waste campus.

[1] Ellen MacArthur Foundation. The Circular Economy in Detail, https://www.ellenmacarthurfoundation.org/explore/the-circular-economy-in-detail

2.2.1 Campus Level Plans and Policies

At the campus level, the Campus Strategic Plan, sustainability is one of the four core values and key priorities for TRU. Although not directly included in the plan strategies, efforts to reduce and divert waste support the Campus Strategic Sustainability Plan priorities in all six areas:

1. Carbon Neutral and Net Zero Campus
2. Eliminate Single-Use Items
3. Sustainable Purchasing
4. Water Conservation
5. Sustainability in the Built Environment
6. Global Impact

In 2019, TRU commissioned a Sustainable Purchasing Guide to provide guidance on including sustainability within standard procurement processes and departmental operations. This guide includes simple steps and tools to evaluate purchase decisions considering risk and opportunity, supplier leadership, lifecycle analysis and total cost of ownership. In September 2021, the Environmental Sustainability Advisory Committee (one of TRU's dual Board and Senate committees), supported the idea to start a new Sustainable Purchasing subcommittee.

2.2.2 Municipal and Regional Level Plans and Policies

Reducing waste also supports municipal, regional and provincial goals. The City of Kamloops Community Climate Action Plan[2] Big Move 5 sets targets to reduce waste to landfill by 50% by 2028 and by 90% by 2050. Disposal rates are measured and reported per annum. In 2020, the City of Kamloops disposal rate was 740 kg per person. The Thompson-Nicola Regional District's Solid Waste Management Plan sets disposal rate targets to 560 kg per person by 2023 and 500 kg per person by 2028. In 2018, the regional's disposal rate was 614 kg per person.

2.2.3 Provincial and Federal Level Plans and Policies

Waste reduction targets are also set at a provincial level through the Ministry of Environment and Climate Change Strategy. The provincial level target for waste disposal is set at 350 kg per person by 2020. In 2019, the provincial forecasted waste disposal rate was 375 kg per person[3].

The province supports municipal level waste reduction through many facets, including:

- Extended Producer Responsibility supports recycling efforts by mandating and shifting the cost onto producers for the end-of-life management for certain products such as beverage containers, packaging and paper, electronics, paint and more. The EPR five-year action plan will introduce more product categories into the BC Recycling Regulation, including actions and policies to support increased recycling rates in the industrial, commercial, and institutional (ICI) sector.[4]
- CleanBC Organics Infrastructure and Collection Program promotes organics recycling through grants for projects that increase organic waste diversion at the municipal and regional levels.

[2] City of Kamloops. Community Climate Action Plan, 2021. https://www.kamloops.ca/sites/default/files/docs/cityofkamloops_communityclimateactionplan_june2021_final_0.pdf

[3] BC Ministry of Environment and Climate Change Strategy. 2020/21 – 2022-2023 Service Plan, 2020 https://www.bcbudget.gov.bc.ca/2020/sp/pdf/ministry/env.pdf

[4] BC Ministry of Environment and Climate Change Strategy. Advancing Recycling in B.C. Extended Producer Responsibility Five-Year Action Plan 2021-2026, 2021. https://www2.gov.bc.ca/assets/gov/environment/waste-management/recycling/recycle/extended_producer_five_year_action_plan.pdf

- The CleanBC Plastics Action Plan supports plastic prevention by supporting municipal bans on single-use plastics. In July 2021 the province amended legislation enabling municipalities to take action on plastics.

At the federal level, the Canada-wide Strategy on Zero Plastic Waste[5] lays out areas of action to reduce the impact of plastic waste on the environment. In May 2021, legislation was amended to include "plastic manufactured items", allowing the federal government to regulate actions to support the zero-plastic strategy.

Environment and Climate Change Canada (ECCC) published regulations[6] and guidance[7] documents that are set to be adopted in December 2022 that will regulate problematic plastics by banning manufacture, import, sale and export of, carry-out bags, straws, cutlery, ring carriers, and foodservice ware.

2.3 Supporting Programs

The Sustainability Office has several programs to support zero waste through campus engagement opportunities and campus operations. Student clubs, awards programs, student and staff ambassador programs, and sustainability engagement programs are in place to educate and drive behavior change on campus.

2.3.1 Education and Behaviour Change Programs

The Sustainability Office uses principles of Community-Based Social Marketing (CBSM), an effective method to drive sustainable behavior. CBSM focuses on direct contact (peer-to-peer) to remove perceived barriers of adopting sustainable behaviour. Current education and engagement programs include:

- **Fill-It Forward Campaign** promotes the use of reusable water bottles and mugs. This program is designed to show the user the impacts of using reusable beverage containers while earning rewards points.
- **All-TRU Sustainability Educators Program** for students, staff, faculty, and administration to engage in peer-to-peer sustainability storytelling
- **TRU Student Sustainability Ambassador Program** for students to spread the 'spirit of sustainability' at TRU, where completion of the program of 500 'touch-points' over a minimum of one semester leads to credits that can be applied towards tuition
- **TRU Employee Sustainability Ambassador Program** for staff and faculty to spread the 'spirit of sustainability' at TRU, committing to communicating sustainability initiatives with their workplace peer networks during paid time for 10 minutes per day over a one-year period
- **Campus Sustainability Walking Tours** are tailored tours designed to educate and promote discussion on sustainability, showcasing campus initiatives such as the composting program or waste management systems
- **Films For Change** is a community inspired film series connecting community members to raise awareness around sustainability-related issues

[5] Canadian Council of Ministers of the Environment. Strategy on Zero Plastic Waste, 2018. https://ccme.ca/en/res/strategyonzeroplasticwaste.pdf

[6] Environment and Climate Change Canada. Single Use Plastics Prohibition Regulations, 2021. https://www.gazette.gc.ca/rp-pr/p1/2021/2021-12-25/html/reg2-eng.html

[7] Environment and Climate Change Canada. Guidance for selecting alternatives to the single-use plastics in the proposed Single-Use Plastics Prohibition Regulations, 2021. https://www.canada.ca/en/environment-climate-change/services/managing-reducing-waste/consultations/proposed-single-use-plastics-prohibition-regulations-consultation-document.html

- **Environmental Sustainability Achievement Awards** include three awards (two student bursaries each at- $1000) and one staff award ($1000 professional development or sustainability-related program), and the Tom Owen Environmental Leadership Award (one student gets $1000) that recognizes contributions to sustainability.
- **Student Clubs** including TRU Eco, Enactus, TRU Environmental Law and Natural Resources Club, Geography Club, and Biology Undergraduate Students Clubs (BUGs) are opportunities for students to get engaged in campus sustainability at the club/ grass-roots level.

2.3.2 Waste Diversion Programs

There are many waste diversion programs in operation on campus. The following section discusses the programs in place to divert four broad categories of waste: food waste, packaging, construction waste, and durable goods. A fifth category is also discussed, comprising of waste that doesn't fit into the four main categories (i.e., batteries, hazardous).

- **Food Waste**
  TRU was a community-leader and early-adopter of food waste diversion, overcoming the challenge of lack of local services and processing options to divert food waste by investing in on-site composting technology in 2014. This technology significantly increased waste diversion rates, but issues with odour and mechanical challenges with the technology and human resources have shifted composting off-site in recent years.

  Food waste is diverted both to composting and to animal feed on campus. Programs are in place to collect food waste from campus food service operations, from waste stations across campus grounds, at events, and through the Culinary Arts and Meat Processing programs (meat trimmings are sent to animal feed). Coffee grounds are also collected from campus cafes.

  TRU began two food waste compost initiatives in the fall of 2021. In association with the company EcoSafe, TRU began a compost pilot project at the McGill residence, diverting food waste from approximately 305 residences. TRU also changed services for diverting food waste from a local farmer to a processing facility based out of Salmon Arm called Spa Hills. The facility offers hauling and processing services and can process a larger number of items than the local farmer was able to accept, such as compostable foodservice ware, soiled paper, certified compostable plastics, and dog waste.

  Cooking oil is collected outside the Culinary Arts and Campus Activity Centre buildings. The oil is collected and used to produce animal feed.

- **Packaging**
  Packaging is a broad category of waste and is diverted on campus through several collection streams for cardboard, containers and paper, beverage containers, plastic bags and overwrap, and polystyrene foam.
    - <u>Cardboard</u>
      In 2020, TRU began consolidating cardboard with the purchase of a baler and new system to collect this stream across campus. Cardboard is collected in open carts at key locations inside buildings. Janitorial staff consolidate cardboard into bales. Once eight bales are consolidated, a

third-party hauler delivers the bales to a local processing facility where the material is sold to market. TRU does not collect revenue or pay processing fees on the baled cardboard.

- Containers and Paper
  Containers and paper recycling stream (mixed recycling) is collected in waste stations across campus. Due to high contamination rates in these stations, TRU implemented a post collection sorting system whereby janitors remove all contaminants before the material is collected by a municipal recycling hauler on a weekly basis. Sorted material is placed in recycling carts, which are collected and delivered to a local processing facility.
- Beverage Containers
  Beverage containers are collected in waste stations across campus and at events and food services. A school group collects the containers and returns them to a bottle depot for the refund.
- Polystyrene Foam
  Foam packaging is collected in yellow carts located in key campus buildings. The carts are emptied by janitors and the foam is consolidated and taken to a recycling centre.
- Plastic Bags and Overwrap
  Plastic bags and overwrap are collected in stand-alone bins located in each building on campus. Bins are emptied by janitors and consolidated prior to taking them to a recycling centre.

- **Construction, Maintenance and Trades Waste**
  Construction waste has historically only been diverted for new LEED certified buildings (i.e. the new Nursing building). In LEED buildings, waste diversion is required as part of the certification process. For most other construction projects managed by contractors, there are no policies or systems to divert waste from ongoing construction and renovation activities. For construction projects managed by TRU staff, there are some systems in place to divert waste to recycling streams (wood and metals).
  - Wood
    Wood waste is diverted in the Trades building, Facilities building, and three or four times per year outside the Old Main building for the Fine Arts program after each theatre production. Wood waste is collected in roll-off bins and taken to the landfill for recycling.
  - Metal
    Metal is diverted at the Trades and Facilities buildings. Trades manages their own metal recycling and sort the different types of metals to maximize revenue for higher value-metals. These bins are collected by the metal recycler on an as-needed basis. Facilities collects scrap metal from various maintenance projects and niche departments on campus. This bin is collected by a waste hauler and recycled as scrap metal at the landfill.

- **Durable Goods**
  TRU has programs to divert usable goods for reuse such as textbooks, textiles, and infrastructure such as office furniture and electronics which are sold through BC Bid.
  - Textbooks
    Textbooks are collected from the campus community and the public in a bin located outside the campus bookstore through the Textbooks for Change program.
  - Textiles

Textiles are collected in three bins located on campus through Diabetes Canada textile program. The bins are emptied, and items are taken to Value Village for sorting and grading into resale and recycling streams.

- Office Furniture and Equipment
  When office furniture and equipment is replaced, the items are sold through BC Bid. This program is managed by Campus Procurement.

- **Other Diversion**
  Other diversion programs include yard waste, batteries, electronics, and hazardous waste.
  - Yard Waste
    Maintenance of campus grounds results in the most abundant stream of diverted waste on campus. Yard waste is collected by staff and contractors and taken to a municipal yard waste drop-off site nearby.
  - Batteries
    Batteries are collected in bins located in each major building on campus. Batteries are collected by Facilities staff and consolidated in their building. Batteries are sent to a recycler on a quarterly basis.
  - Electronics
    Electronics are collected by the Electronics Recycling Association in two buildings on campus: Old Main and the Campus Activity Centre. Bins are emptied on an as-needed basis. Vandalism of these bins has been an issue.
  - Hazardous Waste
    The TRU Office of Safety and Emergency Management (OSEM) manages the hazardous waste, primarily generated through the Trades and Science departments.

2.4 Governance and Supporting Programs

Decisions made at the corporate, academic, and administrative levels influence how waste is generated and disposed. TRU has established the Environmental Sustainability Advisory Committee (ESAC) to advise on sustainability related matters. ESAC has formed the Zero Waste Subcommittee that advises on matters related to waste management practices and policies.

There are three bodies responsible for the waste generated and managed on campus: Procurement Services, Campus Services, and Campus Infrastructure and Sustainability. Responsibilities are further discussed below.

2.4.1 Governance Structure

TRU is governed by three bodies responsible for corporate and academic decision-making: a Board of Governors (Board) that oversees corporate decisions, a Senate and a Planning Council for Open Learning that oversees matters related to academic decisions. As a public post-secondary institution, the President and Vice-Chancellor is responsible to the Board of Governors and Senate, with Vice-Presidents for Academic and Research, Administration and Finance and University Relations reporting to the President.

ESAC advises the Board and Senate regarding the development, operation, and evaluation of sustainability-related policy, including the TRU Campus Strategic Sustainability Plan. ESAC makes recommendations to Administration, Board and Senate, and communicates with the Sustainability Office on related matters.

ESAC meets monthly while TRU is in full session, and is comprised of the following members:

- Members appointed by the Board (3)
- Faculty (5) (with a recommendation for at least one representative of the Wellness Committee),
- Staff (2)
- Director of Facilities or designate
- Ancillary Services Director or designate
- Joint OH&S representative (1)
- Students appointed by the Student Union (2)
- General Counsel or designate
- Director or Manager of the Sustainability Office
- Deans Council representative
- Director of Aboriginal Affairs or designate
- Accreditation Liaison Officer (non-voting)

2.5 Management of Waste

Many departments are involved in managing TRU's waste at various stages, from the purchase of items and materials to the disposal of goods. Key departments and offices include Purchasing, Facilities, Janitorial Services, Food Services, TRU Housing, Capital Projects and Construction, Athletics and Recreation, Information Technology, and the Sustainability Office.

The Sustainability Office is a division of Campus Infrastructure, Sustainability and Ancillary Services and works with all levels of governance, administration, and management to drive waste reduction and diversion activities on campus. The Sustainability Office is guided by the Campus Strategic Sustainability Plan with the goal of becoming a Zero Waste Campus.

3 System Characterization and Assessment

3.1 Waste Generation

TRU tracks waste generation and associated costs on an ongoing basis for campus operation waste and has plans to begin tracking waste generated through construction and renovation activities and campus residences. Although 2020 data is available, the impacts of COVID-19 in 2020 would not represent normal levels of waste generation and was therefore excluded from this report's analysis of TRU's waste generation.

The following figure shows the estimated amount of garbage disposed through campus operations from 2015 – 2019. The chart also shows a possible short-term goal of reducing garbage disposed by 50% over a baseline level of 200 tonnes per year (TPY) for the 2015 – 2017 period. The average garbage disposed in the period from 2018 - 2019 increased to 260 tonnes per year. Historic data variation was due to sampling techniques; however, TRU has since moved to a system that allows for more accurate data measurements for garbage tonnage.

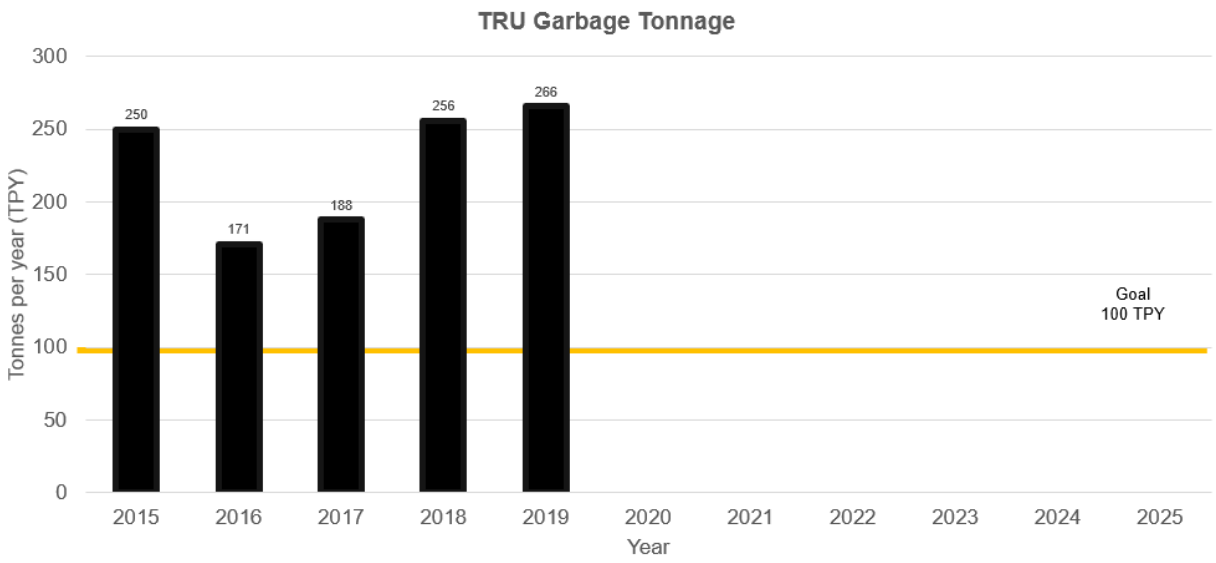


Figure 3-1 - TRU Garbage Tonnage by Year 2015 - 2019

The figure below shows total waste generated at TRU over the 2015 – 2019 period. In 2019, TRU diverted 61% of waste generated to compost and recycling. The chart shows that over time there is an increasing amount of total waste managed by TRU, with nearly 700 tonnes managed through various systems in 2019.

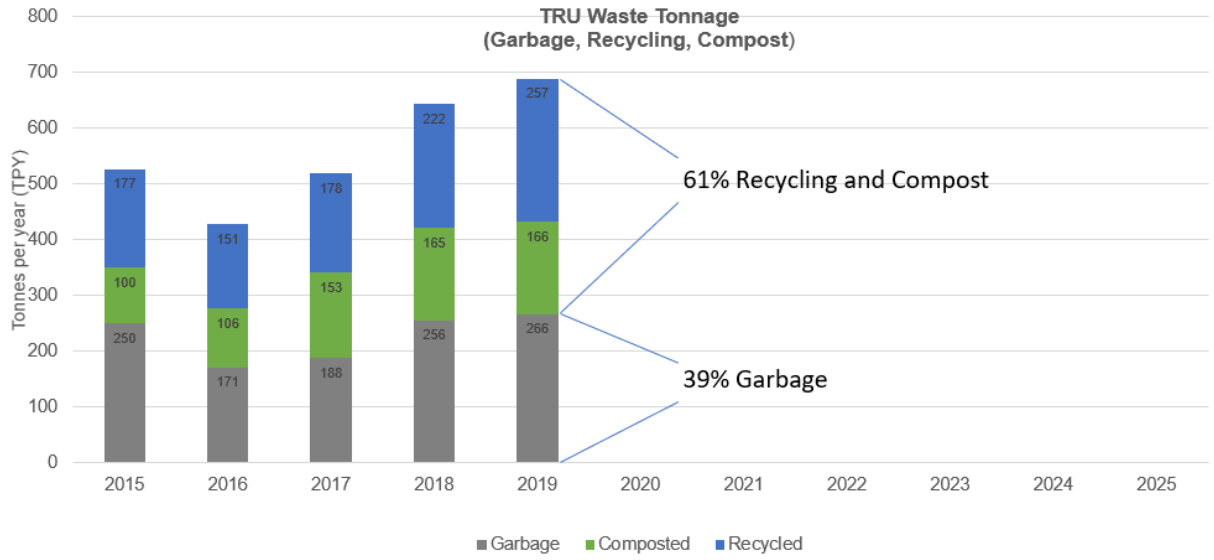


Figure 3-2 - TRU Garbage, Recycling and Composting Tonnages by Year 2015 - 2019

3.2 Sources of campus operation garbage

A waste composition audit was performed for campus operations in 2018. This audit looked at what was in the garbage from different sources on campus. The following chart shows a breakdown of how much waste is generated from the different sources at TRU. The largest amount of waste was collected through the zero waste station garbage bins (39%). The three areas where food is sold (Culinary Arts, the Campus Activity Centre, and

Cafes) accounted for 34% of the overall waste. The remaining 27% of waste was collected through trades, warehouse, washrooms, offices, Animal Health Technology, the daycare, and science labs.

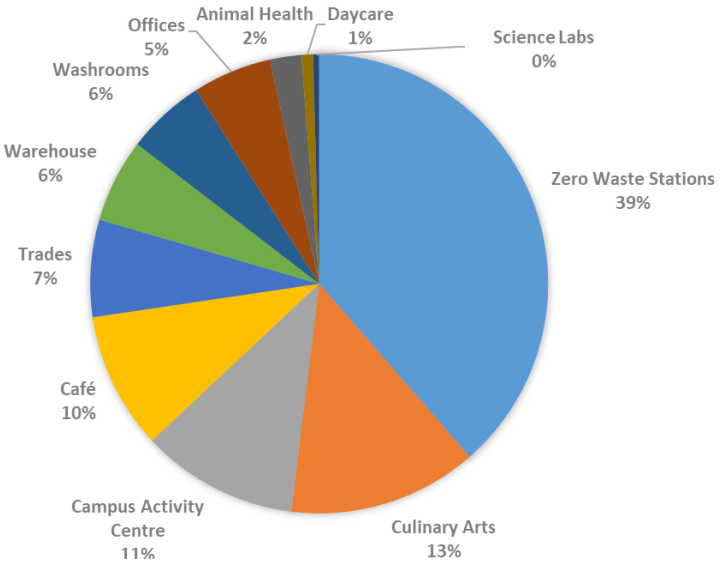


Figure 3-3 - Campus Operations Garbage by Source 2018

3.3 Waste Composition for Campus Operations

The following section includes a series of figures showing the composition of garbage from campus operations, colour coded by material that can be composted (green), recycled (blue), and other (grey). The lighter shades in the figures on the right are types of waste that can be prevented through zero waste initiatives presented in this plan, and the darker shades are items that can be diverted through current TRU programs. The materials shown in grey are items that are more difficult to divert and thus present an opportunity to design these out of the system through policy within TRU procurement or various levels of government. The figures on the left show detailed types of materials in the garbage, and the chart on the right show the breakdown of garbage that can be either composted or recycled.

3.3.1 Overall Garbage Composition

The figures below show the overall composition of garbage at TRU based on the 2018 waste composition audit by weight. Nearly half of the garbage generated at TRU was compostable material (49%), with the largest segment of compostable material being edible or preventable food scraps (24%). Inedible, or non-preventable food scraps accounted for 12% of compostables, 9% was paper towel and food-soiled paper and 3% was pet waste. 29% of the overall garbage was recyclable material, with the largest segment being to-go containers and cups sold on campus (13%). 78% of waste generated on campus can be diverted through current programs, and 46% of waste could be avoided through waste prevention strategies.

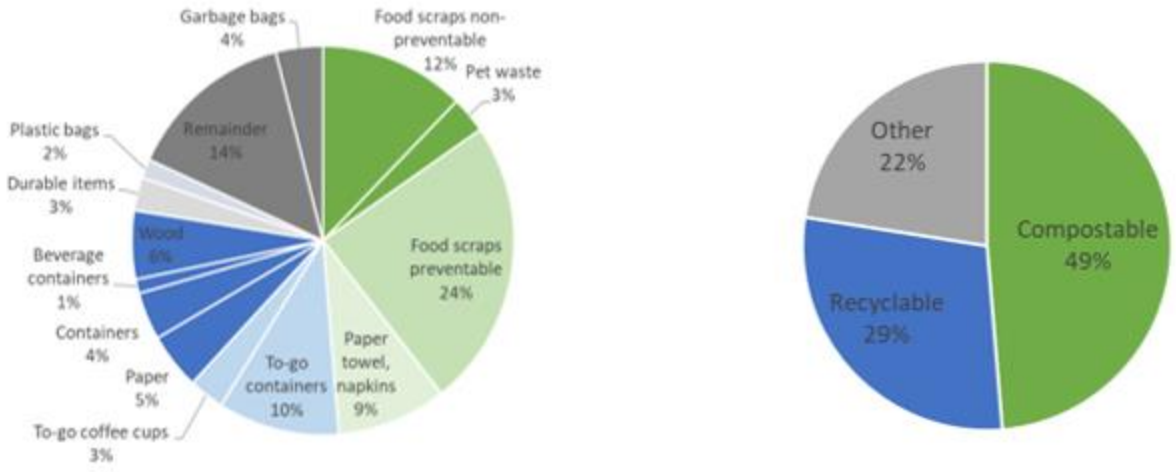


Figure 3-4 - Overall Campus Operation Garbage Composition

3.3.2 Zero Waste Station Garbage Composition

Zero waste station garbage was the largest source of waste on campus, accounting for 39% of total garbage (Figure 4). The charts below show the composition of zero waste station garbage. The chart on the right shows that 83% of garbage could be diverted through current programs. Recyclable material accounted for 44% of this garbage, with to-go containers and cups being the most common material in this group (32%), and 11% other recyclable material. Compostable material accounted for 39% of this garbage, with 16% edible food, 14% inedible food and 9% compostable paper.

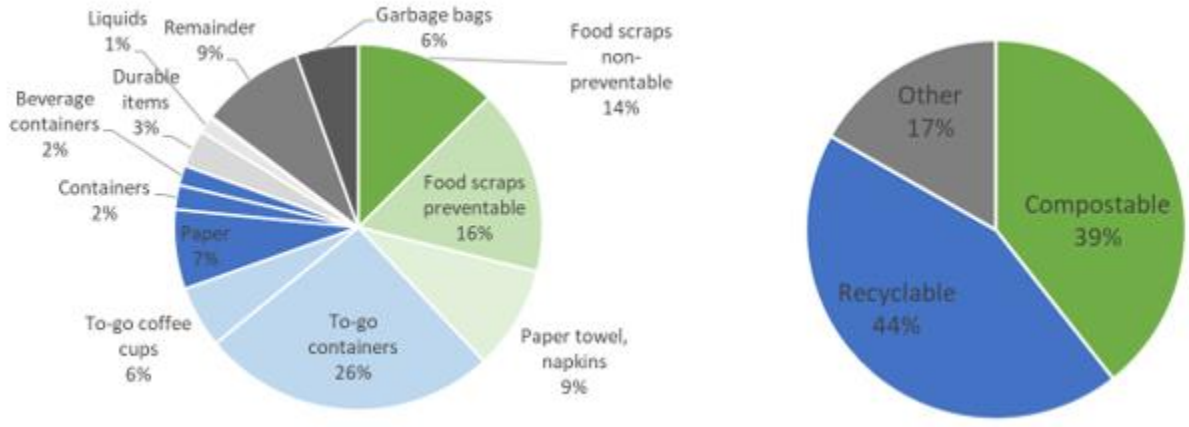


Figure 3-5 - Zero Waste Station Garbage Composition

3.3.3 Food Services and Culinary Arts

Food services on campus (Culinary Arts, the Campus Activity Centre [CAC], and Cafes) combined accounted for 34% of the overall waste from campus operations (Figure 4), accounting for 13%, 11%, and 10% of campus operations garbage, respectively.

Culinary Arts

The figures below show the composition of Culinary Arts garbage. The figure on the right shows that 70% of garbage could be diverted through current programs. Compostable material accounted for 61% of this garbage, with 48% edible food, 9% inedible food and 4% compostable paper. Recyclables accounted for 9% of garbage.

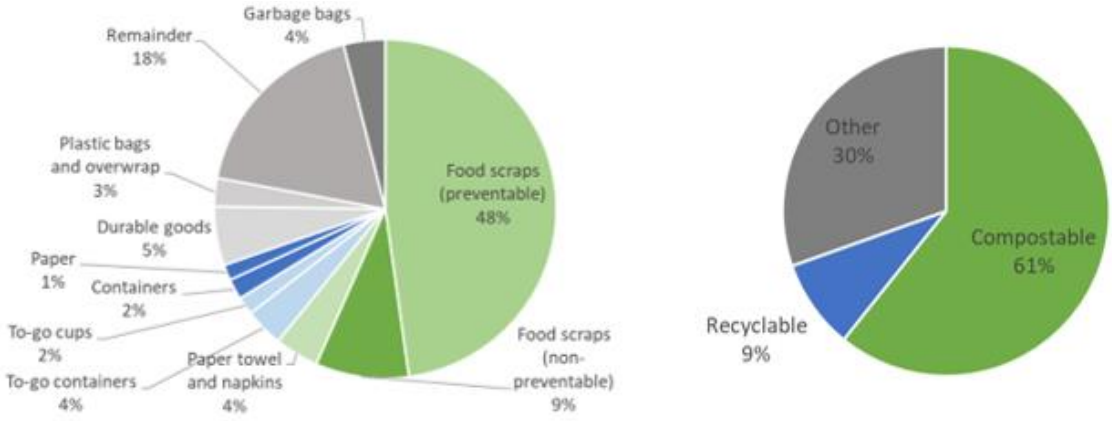


Figure 3-6 - Culinary Arts Garbage Composition

Campus Activity Centre

Figure 8 shows the composition of CAC garbage. The figure on the right shows that 91% of garbage could be diverted through current programs. Compostables accounted for 82% of this garbage, with 63% edible food, 18% inedible food and 1% compostable paper. Recyclables accounted for 9% of this garbage.

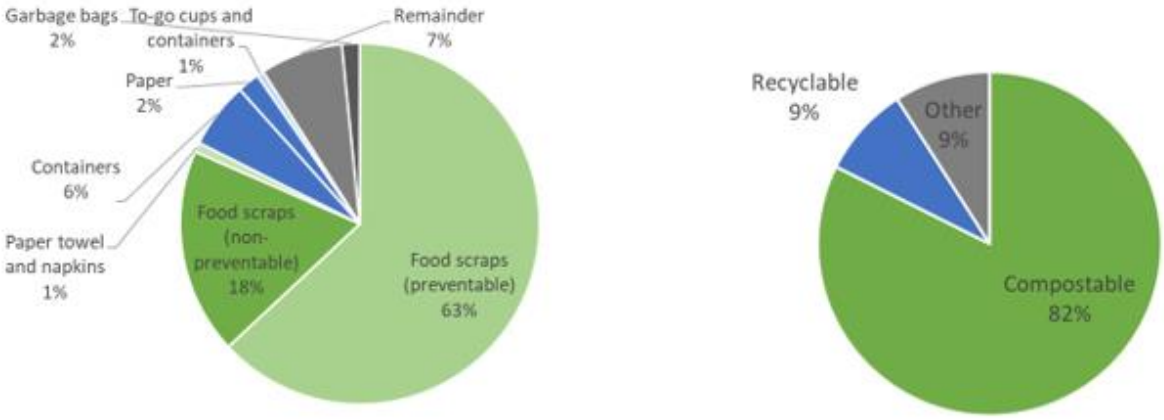


Figure 3-7 - Campus Activity Centre Garbage Composition

Cafes

Figure 9 shows the composition of garbage from cafes on campus. The figure on the right shows that 57% of garbage could be diverted through current programs. Compostable material accounted for 38% of this garbage, with 14% edible food, 16% inedible food and 8% compostable paper. Recyclable material accounted for 19% of this garbage, with packaging containers 14% and to-go containers and cups 6%.

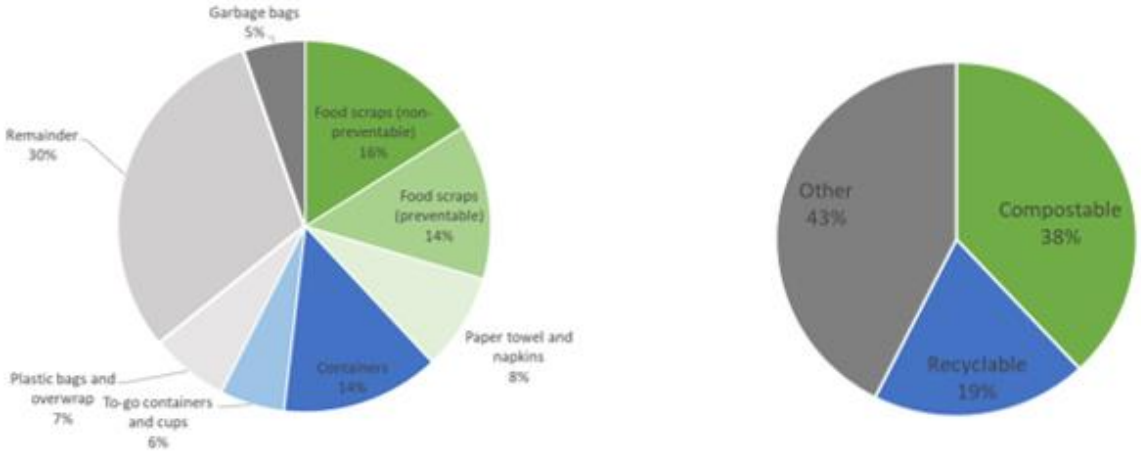


Figure 3-8 - Cafes Garbage Composition

3.3.4 Offices and Washroom Garbage Composition

Offices and washrooms combined accounted for 11% of the overall garbage from campus operations (Figure 4), accounting for 5%, and 6% respectively.

Offices

Figure 10 shows the composition of office garbage. The figure on the right shows that 73% of garbage could be diverted through current programs. Compostable material accounted for 41% of this garbage, with 22% inedible food 14% compostable paper and only 5% edible food. Recyclable material accounted for 32% of this garbage, with 16% paper and 15% recyclable containers.

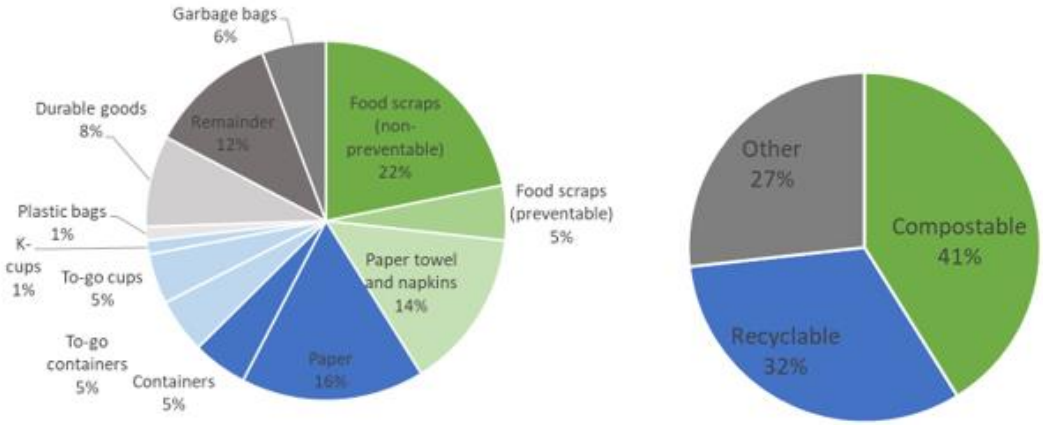


Figure 3-9 - Offices Garbage Composition

Washrooms

Figure 11 shows the composition of washroom garbage. The figure on the right shows that 81% of garbage could be diverted through current programs. Compostable material accounted for 65% of this garbage, with 59% paper towel, and 7% food scraps. Recyclable material accounted for 16% of this garbage, with 11% containers and 4% paper.

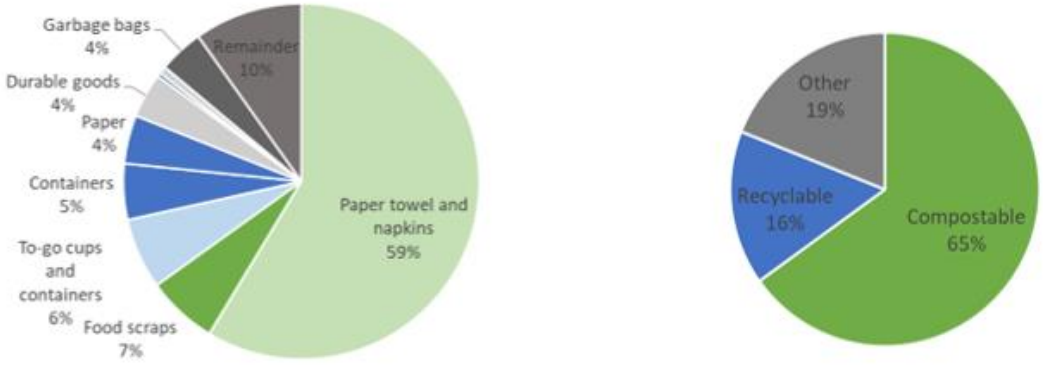


Figure 3-10 - Washrooms Garbage Composition

3.3.5 Warehouse and Animal Health Technology Garbage Composition

Together, the warehouse and Animal Heath Technology accounted for 8% of the overall garbage from campus operations (Figure 4), accounting for 6%, and 2% respectively.

Warehouse

Figure 12 shows the composition of the warehouse garbage. The chart on the right shows that 80% of garbage could be diverted through current programs. Recyclable material accounted for 76% of this garbage, with 66% wood, 6% paper and 3% scrap metal. Compostable material accounted for only 4% of this source waste.

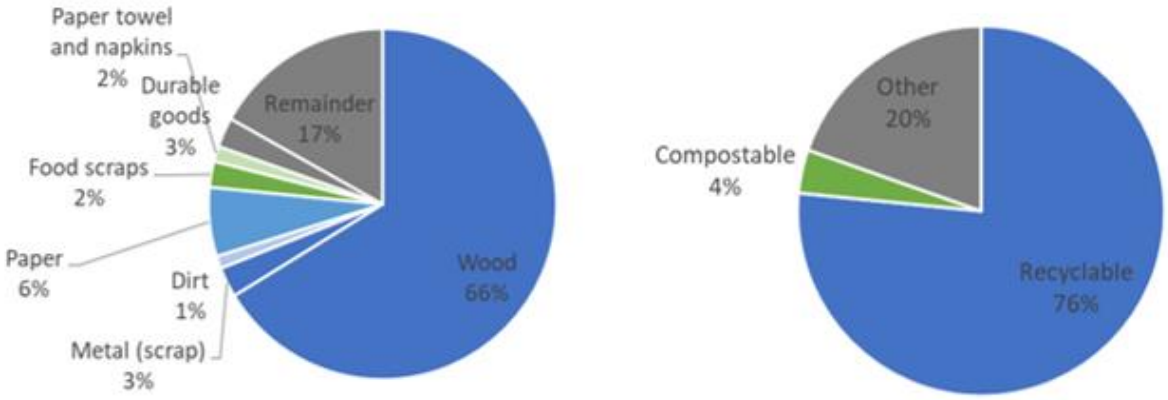


Figure 3-11 - Warehouse Garbage Composition

Animal Health Technology

Figure 13 shows the composition of the Animal Health Technology garbage. The figure on the right shows that 95% of garbage could be diverted through composting for dog and cat waste, and pet food scraps.

Figure 3-12 - Animal Health Technology Garbage Composition

3.4 Waste Composition for Campus Residences

An audit of garbage from McGill and East Village campus residences was performed in August 2021. Figure 14 shows that 88% of the garbage can be diverted through composting and recycling. The figure on the left shows that food scraps was the most significant type of waste (21%). Wood (20%) and soft plastics (18%) accounted for a significant amount of recyclable waste, which are streams of waste not currently diverted at residences.

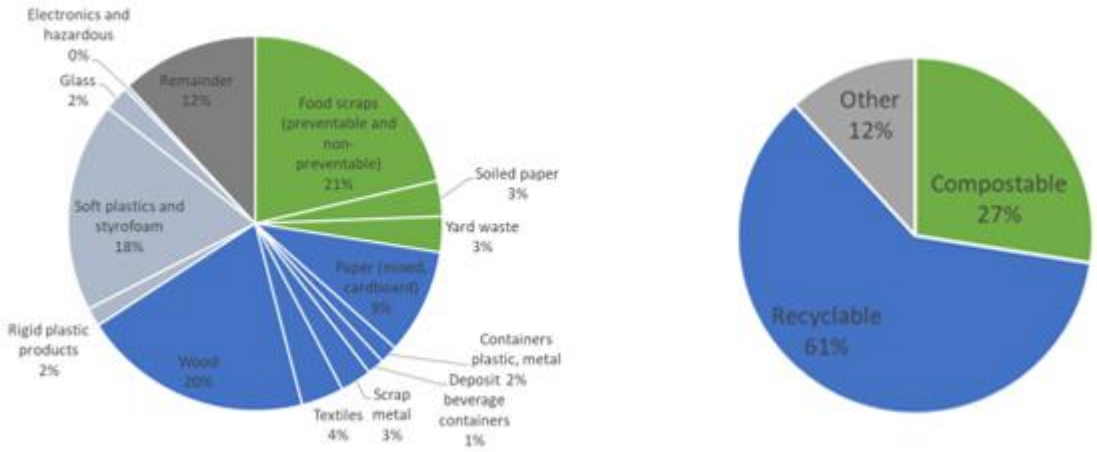


Figure 3-13 - Campus Residences Garbage Composition

3.5 Stakeholder Survey

Stakeholders across all three sectors of campus (operations, residences, and construction) have been engaged through the development of this plan. A draft plan was presented to groups of stakeholders in the Fall of 2021. A survey was sent to participants following the presentations to gauge the level of support for the proposed initiatives, and to understand the perceived challenges and areas of opportunity. The full survey report is included as Attachment "A".

The survey was open from November 2 – 15, 2021, and a total of 27 responses were collected.

The following are some highlights from the survey:

- With respect to waste management services on campus, stakeholders were generally satisfied with access to recycling and composting services, container types and signage, however there is an opportunity to improve on collection frequency (especially in high-traffic areas), zero waste promotion, as well as access to information about waste avoidance and reduction
- There was strong support across all the initiatives presented in the draft plan, with reusable cups, and a web-based sharing platform in campus operations garnering the strongest support
- Food waste diversion in campus residences also garnered strong support from stakeholders
- Construction waste diversion and deconstruction of current projects in campus construction had high levels of support
- General concerns were raised around management costs, health, and safety (specifically for reusables, sharing and reuse initiatives), and the need for education, awareness, and behaviour change
- Challenges raised specific to using reusables were around access to washing stations, storage, and the ability to align with franchise contracts

- For new recycling initiatives and waste diversion for campus construction, access to markets was a top concern
- For deconstruction and construction waste diversion concerns were around getting contractors to "buy-in" and finding vendors (haulers) who provide the services

4 Proposed Targets

4.1 Operational Targets

TRU has adopted a goal of becoming a zero-waste campus. Zero waste means diverting 95% of waste generated. The following chart shows current garbage disposal and projections that can be achieved through a 50% reduction in garbage disposal over a five-year period, with a long-term goal of achieving zero waste by 2035.

The proposed baseline of 200 tonnes per year (TPY) was the average rate over the period from 2015-2017. In 2018-2019, the rate increased to 260 TPY. The dotted grey line over the 2020 – 2022 period represents a period of uncertain data, with 2020 data being an anomaly given that the population and resulting waste generation on campus was significantly lower than normal due to the pandemic, and 2021 data not available.

Given the current trend of growth in garbage disposal per year, the status quo would see TPY rise to 350-430 TPY by 2035. By implementing initiatives presented in this plan, TRU can meet a target of 100 TPY by 2027 – a 50% reduction in garbage disposed over a five-year period.

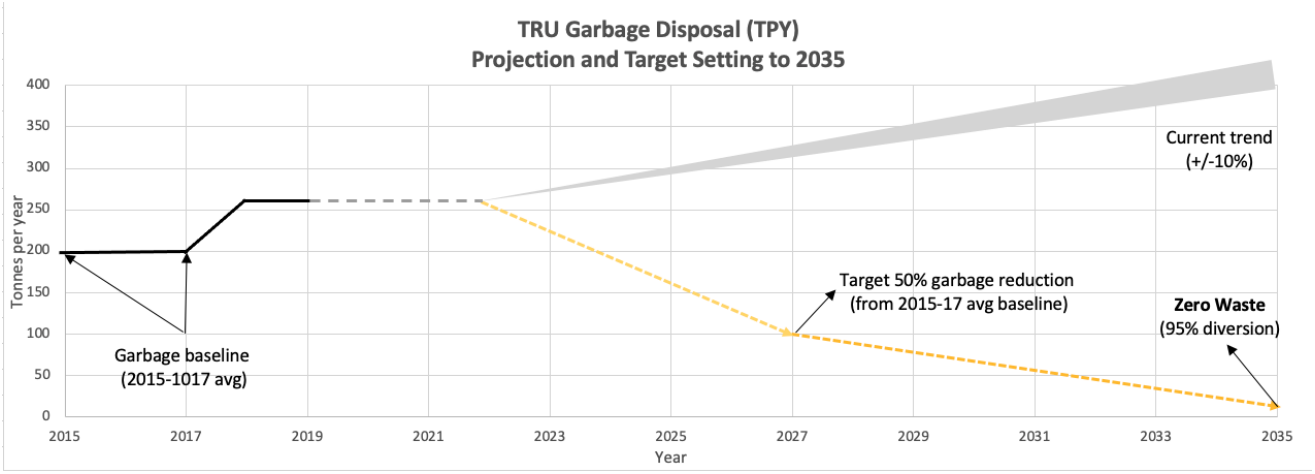


Figure 4-1 - TRU Garbage Disposal Project and Target Setting to 2035

The table below shows the estimated contribution of the proposed zero waste plan initiatives for campus operations towards achieving a target of 50% reduction by 2027. The rationale for tonnes targeted for each initiative comes from reducing the estimated amount of material in the garbage based on waste composition data for tonnes of the disposed items in the baseline period. For example, in the baseline period, 13% of campus operations garbage was single-use items, which represented a total of 26 tonnes. By implementing a single-use reduction strategy, the plan estimates that 75% of the 26 tonnes of single use items in the garbage can be avoided, which gives a total targeted of 20 tonnes.

Repeating calculations for each of the initiatives for campus operations shows that reducing campus operations garbage by 50% (or 100 TPY) over the next five years can be achieved by reducing single-use items by 20 TPY, reducing wasted food by 20 TPY, reducing durable goods in garbage through share, reuse, and repair by 3 TPY, increasing capture of recyclable and composable items by 48 TPY, and diverting 10 TPY recyclable and compostable items through new programs.

Table 4-1 - Estimated Contribution to 2027 Target for Zero Waste Plan Initiatives for Campus Operations

Zero Waste Plan Initiatives Campus Operations	Estimated contribution to 2027 target of 50% garbage reduction against baseline* (200 to 100 tonnes per year in next 5 years)		
	Target %	Tonnes targeted	Percentage Change
Reduce single-use items	10%	20	75%
Reduce wasted food	10%	20	70%
Share, reuse and repair	1%	3	50%
Improve capture of existing recyclable/ compostable items	24%	48	70%
Implement new recycling/ composting programs	5%	10	80%
Total target	**50%**	**100**	
**Based on 2015-2017 average garbage tonnes generated per year*			

4.2 Construction and Renovation Targets

Further data is required to assess performance and set targets in construction and renovation waste activities. The priority for this area is to develop a system to track data related to construction and renovation as monitoring and tracking for this type of waste has historically only been done for LEED certified projects. Once a baseline has been established, the oversight group can work to set targets and action plans related to meeting the long-term objective of 95% waste diversion through proposed initiatives in this plan.

4.3 Housing Targets

While composition data has been obtained for TRU Housing, waste quantities are required to assess performance and set targets. Once baseline has been established, the oversight group can work to set targets and action plans related to meeting the long-term objective of 95% waste diversion through proposed initiatives in this plan. The working group should consist of building managers, maintenance staff and student teams or committees who will ultimately be involved in helping achieve the short and long term targets.

5 Zero Waste Initiatives

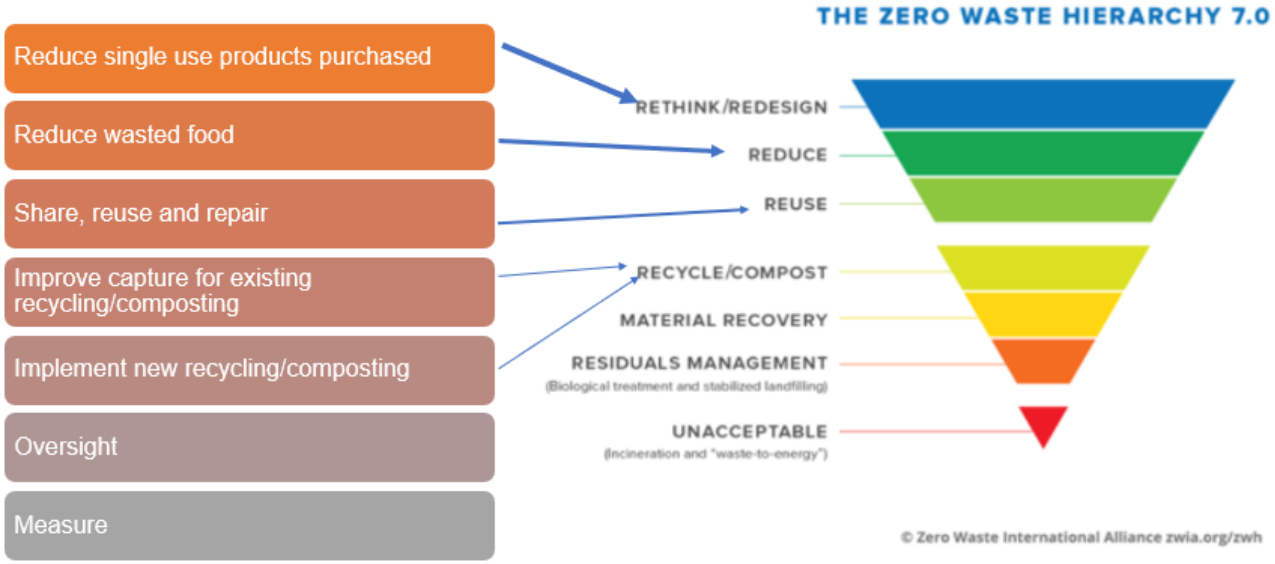
The zero waste initiatives presented in this plan follow the waste hierarchy and include waste prevention actions that reduce the overall amount of waste managed through the system as well as actions that will increase the amount of waste diverted. Oversight and monitoring are also important aspects of the plan that will ensure overall success in meeting plan objectives and targets.

The following section discussed the initiatives and actions for each of the three areas of waste managed by TRU: campus operations, campus residences and campus construction. Each initiative includes an overview, potential next steps, participants involved, and some examples of how the initiative is working in other areas.

5.1 Campus Operations

The figure below summarizes the initiatives for campus operations and how they relate to the waste hierarchy. Working with campus food services managers to reduce single use products by rethinking/ redesigning how items are used on campus is the highest level of the hierarchy with potential for greatest level of impact by designing waste out of the system. Special consideration will be needed for franchises, as their serving ware tends to be standardized. Reducing wasted food, and share reuse and repair are the initiatives in the next level of the hierarchy, and are high-impact initiatives in that they lead to an overall reduction in the amount of waste that is generated and managed. Improving capture for existing and implementing new recycling and composting programs are lower in the hierarchy, as waste is still generated but is diverted to higher-use. Oversight and measurement are key aspects of the plan, but do not specifically relate to the hierarchy but which are necessary components to the plan.

Figure 5-1 Campus Operations Initiatives by Hierarchy



5.1.1 Reduce single-use items on campus

Overview

This initiative focuses on reducing single-use items on campus through vendor contracts and direct procurement (Procurement Services). It also prioritizes the purchase of durable goods over disposable items. A significant portion of the campus operations waste stream is from to-go cups and containers sold on campus (13% of overall waste). Other items such as cutlery, straws, sanitizing supplies stationary and catering items are other items that can be eliminated from the waste stream.

Potential Next Steps

- Assess current procurement practices and contracts and current campus reusable initiatives
- Identify priority areas for incorporating reusable items that displace significant single-use product usage
- Determine reusable items to purchase, resource allocation and behaviour change oriented implementation plan
- Adjust contract and procurement policies to support shift to reusables where it is viable

Participants

- TRU Procurement Services
- TRU Ancillary Services
- TRU Food Services (TRU-led and franchises)
- Culinary Arts Department
- TRU Student Union
- TRU Sustainability Office
- TRU Marketing and Communications

Examples

UBC Mug Share program[8] is a system that aims to reduce the number of disposable cups on campus and beyond. The program works on a deposit system where users of the program can pay a $5 refundable deposit and receive their beverage in a reusable mug at one of the many participating locations. The mugs are returned to participating locations where they are sanitized in dishwashers according to dining safety standards. The program was launched as a pilot in 2019 at both Vancouver and Kelowna campuses. In 2021 the program was officially launched.

Figure 5-2 - UBC Mug Share Program

[8] University of British Columbia, 2021. Mug Share Program, https://www.mugshare.ca/

Northwestern University's Reusable Container To-Go program[9] was launched at the onset of the global pandemic in 2020. Building off a previous voluntary deposit system for reusable containers that had been operating since 2018, the new program aimed to significantly reduce waste and associated handling and disposal costs from disposable containers on campus. 99% of meals served through campus food services were served using a reusable clamshell container. The containers are provided to all users at dining locations for their first meal, with compostable containers available upon request for any subsequent requests. Containers are returned to dining locations where they are sanitized in industrial dishwashers.

Figure 5-3 - Northwestern University Reusable Container Program

The National Zero Waste Council [10] has undertaken research in collaboration with the University of Toronto's Dalla School of Public Health to look at the safety of reusable products in retail settings. The report provides an analysis of the science related to COVID-19 transmission and concludes that "current evidence strongly suggests transmission from contaminated surfaces does not contribute substantially to new infections." While the science supports that reusables are safe to use during the COVID-19 pandemic, clearly demonstrating precautionary measures taken through messaging (i.e., use of industrial dishwashers), can ease uncertainty around the safety of reusables.

5.1.2 Reduce wasted food

Overview

This initiative focuses on implementing food waste prevention strategies for campus food services and catering to save money and use resources wisely. A significant amount of preventable (or edible) food is wasted in food service areas – 63% of Campus Activity Centre food service garbage, 48% of Culinary Arts garbage, and 14% of Café garbage was edible food waste. While this initiative is focused on prevention at the service level, awareness and behaviour change strategies around food waste also presents an opportunity to reduce food loss at the consumer level.

Food waste prevention toolkits include strategies around building a taskforce, creating a culture committed to reducing food waste, separating, and measuring food waste, ways to prevent food waste through planning menus, storage, prep, and serving, as well as recovering food through donation programs and waste diversion.

Potential Next Steps

- Engage with food service providers on campus to identify opportunities to support food waste prevention strategies

[9] Northwestern University, 2021. Reuse Model at Northwestern Dining During a Global Pandemic, https://www.yumpu.com/en/embed/view/hkeULmfaqPwHTr7S

[10] National Zero Waste Council, 2021. Opportunities for Reusables in Retail Settings During the COVID-19 Pandemic in Canada: A Review of Guidance and Evidence, http://www.nzwc.ca/Documents/NZWC_OpportunitiesforReusablesinRetailReport.pdf

- Implement food waste management strategies in food service programs, including setting targets and systems to monitor and measure the impact of waste prevention strategies
- Investigate the use of technology to track data associated with food waste
- Evaluate food waste prevention impacts and prioritize actions to meet targets

Participants

- TRU Ancillary Services
- TRU Food Services (TRU-led and franchises)
- Culinary Arts Department
- TRU Student Union
- TRU Sustainability Office
- TRU Marketing and Communications

Examples

The World Wildlife Foundation's Hotel Kitchen[11] is a toolkit with strategies to engage staff, partners and customers in waste prevention, recovery, and diversion in hotels. These principles can be applied to other food service industries. Participants in the program reduced food waste by 10 – 38% over a three-month period. Case studies within the toolkit show how these prevention strategies have been applied by various organizations, with varying levels of success.

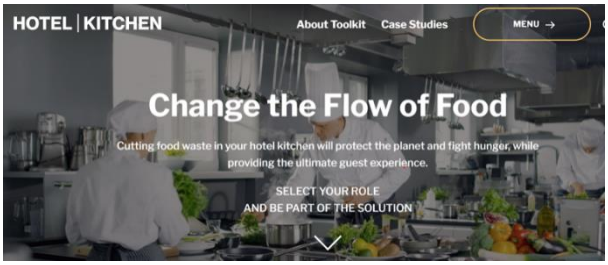


Figure 5-4 - Hotel Kitchen Toolkit

The Province of BC[12] has toolkits and resources aimed to help businesses prevent food waste. The toolkits specific for dining establishments includes an instruction manual and excel spreadsheet to calculate recipe costs and cost of food loss, as well as production planning using historic records. Resources also include staff training videos as well as step-by-step guides and instructions for food service providers to help track and reduce food loss.

Leanpath[13] is an organization that offers technological solutions to help reduce kitchen and plate waste. They are a certified B-Corporation with a suite of services for data collection tools, cloud-based analytics, and coaching.

5.1.3 Share, reuse, and repair

Overview

This initiative focuses on developing and promoting share, reuse, and repair of durable goods on campus. While durable items represent a smaller portion of the overall campus waste stream (3% of total), the social and cultural benefits of shifting to a lower-consuming society will have a significant impact beyond campus borders.

[11] World Wildlife Foundation Hotel Kitchen. Fighting Food Waste in Hotels, https://hotelkitchen.org/wp-content/uploads/2017/11/HotelKitchen_Final_Final_11102017.pdf

[12] BC Ministry of Environment and Climate Change Strategy. Food Service Food Waste Prevention Part 2:Toolkit Instruction Manual for Restaurants, Drinking Places and Specialty Foodservice Operators, https://www2.gov.bc.ca/assets/gov/environment/waste-management/organic-waste/toolkits/part_2_toolkit_manual-foodservice.pdf

[13] Leanpath. Technology services, https://www.leanpath.com

Share, reuse, and repair strategies are aimed at extending the life of durable goods and increasing the overall use of goods in the community.

Potential Next Steps

- Consider developing a web-based "stuff" sharing tool (website or app) for TRU community
- Continue to promote reuse through share-tables in key buildings (for example, 'Free Stuff' tables in key campus buildings).
- Build community partnerships (e.g., partner with Repair Café Kamloops to host repair events on campus)
- Develop a communications strategy for reuse and repair activities
- Complete staff/faculty pilot Move-Out Program, whereby when staff/faculty are moving offices or leaving TRU altogether and have their stuff to deal with, their stuff does not end up in the landfill but instead either gets reused or recycled where appropriate.

Participants

- Janitorial Contractor
- TRU Facility Services
- TRU Sustainability Office
- TRU Procurement Services
- TRU Marketing and Communications
- TRU Makerspace
- Community partners
- Campus Clubs

Examples

There are many apps and social media platforms that facilitate sharing and gifting. Platforms such as the Buy Nothing Project[14] and Peerby[15] are apps that facilitate sharing. The Buy Nothing Project is focused on gifting items, whereas Peerby is specific for borrowing and renting items. Sharing works at local level so it is important to promote a specific platform to build a campus community of gifters. At the time this plan was developed, Buy Nothing had 24 members within a 12 km radius of Downtown Kamloops, whereas the Facebook group Zero Waste Kamloops had over 3100 members. The established community of gifters in Kamloops on the Kamloops Zero Waste Facebook[16] group may not work as well with a younger campus audience. Focus groups may be helpful in determining the most appropriate platform for the campus community.

Figure 5-5 - Buy Nothing Project

[14] The Buy Nothing Project. Gifting platform, https://buynothingproject.org/
[15] Peerby. Borrowing and renting platform, https://www.peerby.com/
[16] Kamloops Zero Waste Facebook Group. https://www.facebook.com/groups/1638833329512689

5.1.4 Improve capture for existing recycling and composting

Overview

This initiative focuses on diverting the existing recyclable and compostable items currently disposed of in the garbage and adding an office deskside recycling program with centralized self-serve zero waste stations. 88% of overall campus operations waste can be diverted through existing recycling and composting programs. Central to this initiative is a robust communication and behaviour change strategy to support desired behaviour using a variety of communication tools and strategies such as user guides, posters, taglines, branding, and web-based tools (sorting games, waste search tools).

Potential Next Steps

- Develop and implement a behaviour change strategy to educate on proper sorting of waste
- Include a timeline and specific strategies in communication plan
- Seek feedback from stakeholders on the effectiveness of outreach, identifying gaps in awareness for future outreach activities
- Review zero waste stations for signage, branding, tagline, material types (single stream vs paper/containers separate), and overall placement/access
- Consider using a mascot to support branding and awareness
- Consider using dioramas (3D signage) in key locations to support awareness of proper sorting
- Consider a campus-specific waste sorting widget embedded on TRU's website to support education on proper sorting
- Implement centralized waste stations in offices
- Set-up office-paper-only recycling bins to reduce contamination of paper
- Set-up paper towel composting system in washrooms
- Assess status of wood waste diversion and ensure capture is being optimized (plan for another audit)

Participants

- TRU Procurement Services
- TRU Ancillary Services
- TRU Food Services
- Janitorial Contractor
- TRU Facility Services
- TRU Sustainability Office
- TRU Student Union
- TRU Marketing and Communications

Examples

Carlton University[17] in Ottawa, Ontario uses an integrated approach to support waste diversion. Two of their facilities are certified Zero-Waste (they achieve 90% diversion rates). While their system is like TRU's zero waste stations (different bins for different streams), they have centralized stations in key areas (their Zero-Waste facilities) with step-by-step instructions for sorting waste branded onto their bins that include a sink where liquids are removed from the waste stream, thus reducing contamination from liquids and providing the ability to rinse containers. These stations include 3D signage and branding, as well as a tagline "We Recycle. You make the difference." Their website includes a Waste Wizard widget to help campus users know where to sort items, as well as a waste management guide, specific for their campus.

Figure 5-6 - Carleton University's Zero Waste Station

Offices are equipped with centralized zero waste stations, which replaces the need for desk-side bins. Staff are responsible for sorting their waste at central stations. Central waste stations save time for cleaning staff and use less garbage bags as deskside garbage bins are eliminated.

5.1.5 Implement new recycling and composting programs

Overview

This initiative includes expanding the list of what can get recycled or composted on campus. There are many specialty waste streams, however these should be evaluated for impact and effort prior to initiating new programs. Some examples of potential new programs that could yield higher impact would be pet waste in the Animal Heath Technology department, which accounted for 3% of overall campus garbage and 95% of the department's garbage.

Potential Next Steps

- Explore diversion of animal waste for the Animal Health Technology Department
- Explore onsite composting of yard trimmings from TRU grounds
- Set-up recycling systems for harder to recycle items. Potential items include:
    - PPE (disposable gloves, safety equipment and protective gear)
    - Pallet wrap
    - Cleaning supplies and accessories
    - Lab plastics
    - Sporting goods
    - Cigarettes and chewing gum

Participants

- Janitorial Contractor
- TRU Facility Services

[17] Carleton University. Waste and Recycling Campus Operations, https://carleton.ca/sustainability/campus/waste-recycling/

- TRU Sustainability Office
- TRU Grounds/ Horticulture (and associated contractors)
- TRU Marketing and Communications
- Trades Department
- Visual Arts Department
- Theatre Arts Department
- Animal Health Department
- Science and Nursing Departments
- TRU Wolfpack

5.1.6 Oversight: strengthen the Zero Waste Subcommittee to oversee plan implementation

Plan oversight includes regular meetings with key stakeholders responsible for plan implementation to ensure progress is being made according to established timelines. The group is responsible for identifying gaps in performance and where additional resources are needed to meet targets. This initiative requires inputs from performance monitoring and reports to the Environmental Sustainability Advisory Committee and other campus departments.

Potential Next Steps

- Create a group of key stakeholders with the purpose of guiding operations to ensure the plan is moving forward
- Ensure that the group consists of key personnel that can make decisions and direct operations as necessary
- Meet as on a regular basis (monthly, bi-monthly, or quarterly) to review performance metrics and status of plan actions

Participants

- Janitorial Contractor
- TRU Facility Services
- TRU Sustainability Office
- TRU Procurement Services
- TRU Ancillary Services
- TRU Food Services
- TRU Marketing and Communications
- TRU Student Union

5.1.7 Measure performance

Overview

As with any plan, measuring and tracking performance is the only way of knowing what is working and what may need to be adjusted. Ensure that data is reported back to key stakeholders in a timely manner and celebrate achievements by recognizing of gains towards meeting plan objectives. If performance is trending away from targets, the role of the oversight team is to make necessary adjustments to support moving towards targets.

Potential Next Steps

- Continue tracking and reporting waste generation data on a quarterly and annual basis
- Perform waste composition audits prior to and after implementing diversion and reduction programs
- Review performance against targets and take actions as required to continue working towards plan objectives
- Establish metrics for evaluating impacts of current and future waste reduction programs
- Explore technology solutions to improve data accuracy and systems to automate data tracking

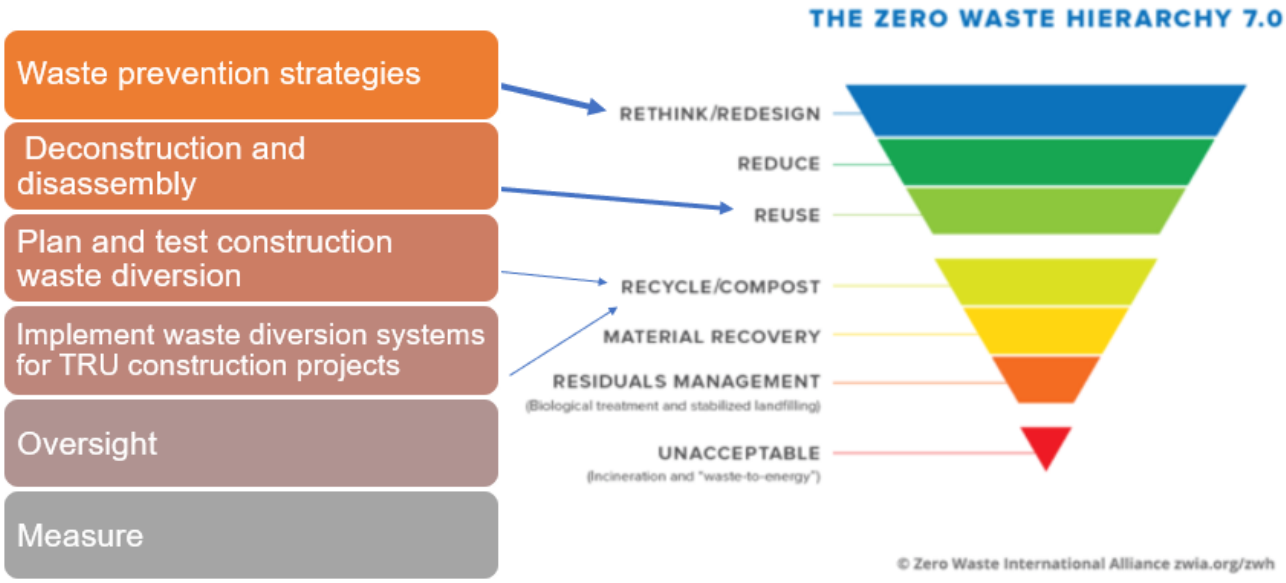
Participants

- Janitorial Contractor
- TRU Facility Services
- TRU Sustainability Office
- TRU Ancillary Services
- TRU Food Services
- Third-party contractors

5.2 Campus Construction and Renovation

The figure below summarizes the initiatives for campus construction and renovation and how they relate to the waste hierarchy. Waste prevention strategies that rethink/ redesign how items are used in construction and renovation is the highest level of the hierarchy. Deconstruction and disassembly are the next level in the hierarchy and is a high-impact initiative that leads to an overall reduction in the amount of waste that is generated and managed. Construction waste diversion is the next level down the hierarchy and leads to increased amount of diverted materials. Oversight and measurement are key aspects of the plan that do not specifically relate to the hierarchy, but which are necessary components to the plan.

Figure 5-7 Campus Construction and Renovation Initiatives by Hierarchy



5.2.1 Waste prevention strategies

Overview

This initiative includes reviewing industry best practices for construction waste prevention, from material procurement and design choices to support for future disassembly and deconstruction initiatives. This initiative might be a student-led research project that includes engagement with TRU construction stakeholders around how best practices for waste prevention can be incorporated at the campus level.

Potential Next Steps

- Review best practices for construction waste prevention
- Explore how design for deconstruction can be incorporated into TRU's long-term planning for new construction projects and within the Trades faculty
- Consider incorporating design for deconstruction principles into Trades curriculum
- Identify opportunities to disassemble and salvage reusable material in renovation projects

Participants

- TRU Campus Infrastructure
- TRU Facilities
- TRU Utilities
- Third-party contractors
- TRU Sustainability Office
- TRU Research
- Trades Faculty

Examples

Light House Sustainability Society based in Vancouver, BC developed a report called Design for Disassembly for Residential Construction[18]. While the focus of this document is on residential construction, the principles can be applied to institutional construction and renovation design. The principles are about designing buildings with the end-of-life in mind. While the upfront cost of material and labour may be higher because components are designed to last longer and be more recoverable, it can reduce the cost of maintenance when components that have a shorter lifespan can be more easily replaced, rather than replacing the building itself.

Figure 5-8 - Light House Design for Disassembly

The National Zero Waste Council commissioned Light House Sustainability Society to develop a national database[19] for new construction that uses LEED Certified project data. As a public institution, new buildings at TRU are required to meet LEED Gold standards. This report includes data and analysis on waste quantities, construction costs, recycling rates as well as case examples for several LEED certified projects.

Metro Vancouver has a resource guide for the construction industry called Construction and Demolition Waste Reduction and Recycling Toolkit[20]. While the toolkit contains specifics for meeting requirements to meet regional regulations, many of the principles can be applied locally. The guide contains specifics around the types of materials that can be salvaged or diverted from construction sites, alternatives to traditional demolition, resources for managing hazardous waste, and facilities and services in the area.

Figure 5-9 – Metro Vancouver Construction and Demolition Toolkit

[18] Light House. Design for Disassembly for Residential Construction, 2021. https://www.light-house.org/wp-content/uploads/2021/04/DfD-Report-Final.pdf

[19] Light House. Watching our Waste: A National Construction Waste Analysis In Canada Using LEED™ Certified Project Data, 2021. http://www.nzwc.ca/Documents/WatchingOurWaste-Analysis.pdf

[20] Metro Vancouver. Construction and Demolition Waste Reduction and Recycling Toolkit, 2020. http://www.metrovancouver.org/services/solid-waste/SolidWastePublications/DLCToolkit.pdf

5.2.2 Disassembly and deconstruction

Overview

This initiative prioritizes reuse of materials when taking down buildings or renovating. Based on engagement with construction stakeholders, this is something that is already being done with campus renovation projects and should continue to be encouraged and supported.

Potential Next Steps

- Work with local government to seek construction-related recycling infrastructure and programs
- Identify opportunities to disassemble and salvage reusable material in renovation projects

Participants

- TRU Campus Infrastructure
- TRU Facilities
- TRU Utilities
- TRU Trades
- Third-party contractors
- TRU Sustainability Office

Examples

The City of Vancouver has a bylaw[21] with minimum reuse and recycling requirements that apply to demolition waste when you demolish a house built before 1950. Additionally, a deconstruction requirement applies when you demolish a heritage listed house, or a house built before 1910. Fully deconstructed projects can achieve a 95% or higher diversion rate.

5.2.3 Plan and test a construction waste diversion program

Overview

This initiative includes developing best practices and resources for construction waste diversion for campus projects, looking at how systems are currently managed and then developing diversion strategies for highest priority materials. The outcome of this initiative is a best practice guide which would include signage, toolkits, and recommended haulers.

Potential Next Steps

- Review current systems for managing construction waste
- Develop and test waste diversion for highest priority materials (e.g., high volume, bulky, hazardous)
- Develop resources for construction waste diversion (signage, campus toolkit, recommended haulers)

Participants

- TRU Campus Infrastructure
- TRU Facilities
- TRU Utilities
- Third-party contractors

[21] City of Vancouver. Demolition permit with recycling and deconstruction requirements, https://vancouver.ca/home-property-development/demolition-permit-with-recycling-requirements.aspx

- TRU Sustainability Office

Example

UBC has developed a step-by-step guide[22] for demolition and construction waste diversion projects for campus. There are six key elements in this guide, starting with engaging with contractors to estimate the amount of material that will be generated and diverted, setting targets based on estimates, planning the project identifying best locations for recycling stations, engaging with staff and subcontractors, tracking, and monitoring, and evaluating once project is complete.

TRU can develop a similar guide, being sure to identify sites, haulers, and services available in the local context. This may be an area where engagement needs to happen to develop these services to identify haulers that are willing to step up to help TRU meet their objectives.

5.2.4 Waste diversion programs for construction and renovation

Overview

This initiative includes diverting recyclable and salvageable materials going to landfill for TRU projects. This includes establishing a policy for third-party contractors requiring waste management plans that includes systems to track and divert waste, with ongoing monitoring of projects to ensure that they are meeting requirements and providing feedback on performance.

Potential Next Steps

- Implement waste diversion systems for construction materials
- Establish policy to require waste management plans from third-party contractors for TRU projects
- Engage with construction contractors prior to projects to ensure systems are in place to track and divert waste
- Monitor construction waste management and communicate feedback on performance

Participants

- TRU Campus Infrastructure
- TRU Facilities
- TRU Utilities
- Third-party contractors
- TRU Sustainability Office

[22] University of British Columbia Sustainability and Engineering. Simple Steps for Demolition and Construction Waste Diversion, https://sustain.ubc.ca/sites/default/files/uploads/CampusSustainability/CS_PDFs/RecyclingWaste/Simple_Steps_C&D_Waste_Diversion_18Sept14.pdf

Example

Sea to Sky Removal[23] in a Squamish-based company serving the lower mainland. They offers pick up of construction waste from any size construction or renovation project that doesn't have space for a bin or doesn't want a bin. They offer full-service hand-sort and live load material such as metal, plastics, wood, concrete, drywall, and any garbage such as old insulation, ceiling tiles, as well as demolition waste. They also offer on-site recycling stations for metal, cardboard, and plastic (ideal for foams, hard packaging from tools, or finishing items).

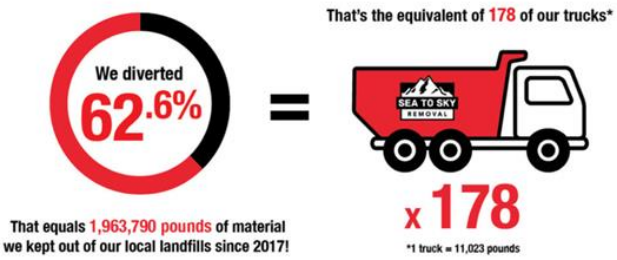


Figure 5-10 - Sea-to-Sky Removal Construction Waste Hauler

5.2.5 Oversight: create a committee to oversee plan implementation

Plan oversight includes regular meetings with key stakeholders responsible for plan implementation to ensure progress is being made according to established timelines. The group is responsible for identifying gaps in performance and where additional resources are needed to meet targets. This initiative requires inputs from performance monitoring and reports to the Environmental Sustainability Advisory Committee and other key stakeholders.

Potential Next Steps

- Create a group of key stakeholders with the purpose of guiding operations to ensure the plan is moving forward
- Ensure that the group consists of key personnel that can make decisions and direct operations as necessary
- Meet on a regular basis (monthly, bi-monthly, or quarterly) to review performance metrics and status of plan actions

Participants

- TRU Campus Infrastructure
- TRU Facilities
- TRU Utilities
- Third-party contractors
- TRU Sustainability Office

[23] Sea to Sky Removal, Squamish BC. https://www.seatoskyremoval.ca/

5.2.6 Measure performance

Overview

As with any plan, measuring and tracking performance is the only way of knowing what is working and what may need to be adjusted. Ensure that data is reported back to key stakeholders in a timely manner and celebrate achievements by recognizing gains towards meeting plan objectives. If performance is trending away from targets, the role of the oversight team is to make necessary adjustments to support moving towards targets.

Potential Next Steps

- Implement measures to track waste generated through construction and renovation projects
- Require that contractors and haulers report waste data in all contracts
- Consider incentives or penalties in contracts to help meet performance targets
- Review waste data ongoing to ensure accuracy
- Monitor performance against targets and implement strategies to meet performance objectives
- Consider technology such as bin cameras to monitor waste management practices

Participants

- TRU Campus Infrastructure
- TRU Facilities
- TRU Utilities
- Third-party contractors
- TRU Sustainability Office
- Waste Logic (third-party contractor)

5.3 Campus Housing

5.3.1 Reduce wasted food

Overview

This initiative focuses on implementing food waste prevention strategies using behaviour change tools. An audit of McGill and East Village garbage showed that a significant amount of food is wasted in campus housing (22% of total garbage). Food waste prevention has environmental, social, and economic benefits.

Potential Next Steps

- Engage with students to identify opportunities to support food waste prevention strategies
- Support students to reduce wasted food using communication strategies and behaviour change tools
- Evaluate food waste prevention strategies through student engagement

Participants

- TRU Ancillary Services
- TRU Housing
- Students living in residences
- Third-party contractor for TRU Student Housing (Campus Living Centres)
- Building maintenance personnel
- TRU Sustainability Office
- TRU Marketing and Communications

Examples

One of the priority areas of focus for the National Zero Waste Council is around food waste. The council developed a national strategy[24] aimed at preventing food loss along the supply chain from "farm to fork" in support of Canada's goal of cutting food loss in half by 2030.

There is a lot of work being done around food waste prevention. Love Food Hate Waste[25] is an excellent resource. This image is a poster prepared by the organization profiling Canadian home food waste in 2020: 63% of household food is wasted in Canada, primarily vegetables, fruits, and leftovers. Top reasons why food is wasted is because:

1. it is left too long and not appetizing or unsafe to eat
2. food has expired, and
3. meals were not finished

Love Food Hate Waste Canada offers simple steps to reduce food waste, from storing food so it stays fresh to using up leftovers to meal planning.

Figure 5-11 - National Zero Waste Council Food Loss and Waste Strategy for Canada

[24] National Zero Waste Council. A Food Loss and Waste Strategy for Canada, 2017. http://www.nzwc.ca/Documents/NZWC-FoodLossWasteStrategy-EN.pdf

[25] Love Food Hate Waste Canada. https://lovefoodhatewaste.ca/about/resources

5.3.2 Share, reuse and repair for campus housing

Overview

This initiative focuses on expanding on the share and reuse of durable items in campus housing and developing and promoting repair activities. There is a significant amount of durable goods that can accumulate with student turnover throughout the year and sharing and reuse present opportunities to reduce the amount to durable items consumed and disposed. TRU Student Housing organizes reuse activities during move-out periods. This initiative includes exploring how to bolster the share and reuse activities. Web-based sharing platform and repair events should be planned in conjunction with campus operations to ensure consistency. There is potential for share and repair initiatives to be explored as part of research programs.

Potential Next Steps

- Create a working group to investigate best practices around managing move-out waste
- Explore partnerships to support increased reuse of durable goods from campus housing
- Develop a strategy / concept to support housing reuse
- Engage TRU's student housing contractor to find out what they are doing in other universities they contract with

Participants

- TRU Ancillary Services
- TRU Housing
- Third-party contractor for TRU Student Housing (Campus Living Centres)
- Building maintenance personnel
- TRU Sustainability Office
- TRU Marketing and Communications
- TRU Student Union
- TRU Research and Graduate Studies

Examples

Repair events are common across the world, with Repair Café International providing a foundation, branding and toolkits that are being used by many groups and non-profits in support of fixing broken items. Repair Cafes are free events where anyone can bring a broken household item and a volunteer will show them how to fix it. There is a group in Kamloops that organizes Repair Cafes[26], and just before the lockdown of the pandemic, had hosted a clothing repair event in partnership with TRUSU Eco Club on campus. The local group is always looking for partners to host events.

Figure 5-12 - TRUSU Eco Club Repair Cafe Event

5.3.3 Add food scraps collection to campus housing

Overview

This initiative focuses on diverting the compostable items currently disposed of in the garbage in campus residences. TRU introduced food scraps collection at the McGill residences in September 2021. While several

[26] Kamloops Repair Café. Facebook group https://www.facebook.com/RepairCafeKamloops

challenges were identified during stakeholder engagement with the new system as well as challenges with different housing set-ups in the residences, solutions were also identified. Ideas presented to support improving and expanding food scraps collection included using reminder notes during regular inspections to empty compost bins, changing the type of bins used to collect compost (that look different than garbage bins), and using incentives and rewards for participation.

Potential Next Steps

- Review best practices of other campus residential compost programs
- Start a new residence compost program in East Village
- Collect data for McGill Residence's new compost pilot
- Ensure that compost programs are operational when students move-in in the fall semester (avoid "launching" after move-in)

Participants

- TRU Ancillary Services
- TRU Housing
- Third-party contractor for TRU Student Housing (Campus Living Centres)
- Building maintenance personnel
- TRU Sustainability Office
- TRU Marketing and Communications

Examples

The University of British Columbia[27] has composting services in 4500 residential suites across campus. Residences have sorting areas, typically in a basement, with clearly marked bins for many types of recyclable items including food scraps. The campus provides sorting guides and an online sorting game to help educate students on how to sort their waste. The game includes commonly found items in trash.

Cornell University[28] has a residential compost program for all campus residential communities. The program includes student Compost Managers who receive training and certification to oversee the program in their residential community and provide peer-to-peer support and education on composting practices.

Figure 5-13 - Cornell University Campus Residence Composting Program

[27] University of British Columbia Student Residence, Vancouver BC. https://vancouver.housing.ubc.ca/residence-life/services-amenities/sustainability-features/

[28] Cornell University, Ithaca, NY. https://sustainablecampus.cornell.edu/campus-initiatives/purchasing-waste/food-waste-compost/residential-compost-program

5.3.4 Improve capture of existing recycling

Overview

This initiative focuses on diverting the recyclable items currently disposed of in the garbage in campus residences, using lessons learned from campus operations. A robust communication and behaviour change strategy is central to this initiative to support desired behaviour. A variety of communication tools and strategies such as user guides, posters, taglines, branding, and web-based tools (sorting games, waste search tools) should be considered to improve capture of recyclable material.

Potential Next Steps

- Develop and implement a communication and behaviour change strategy to educate on proper sorting of waste
- Include a timeline and specific strategies in communication plan that targets key stages in student housing (during move-in and move-out times at the start and end of semesters, as well as during daily living)
- Seek feedback from stakeholders on the effectiveness of outreach, identifying gaps in awareness for future outreach activities

Participants

- TRU Ancillary Services
- TRU Housing
- Third-party contractor for TRU Student Housing (Campus Living Centres)
- Building maintenance personnel
- TRU Sustainability Office
- TRU Marketing and Communications

5.3.5 Oversight: create a committee to oversee plan implementation

Plan oversight includes regular meetings with key stakeholders responsible for plan implementation to ensure progress is being made according to established timelines. The group is responsible for identifying gaps in performance and where additional resources are needed to meet targets. This initiative requires inputs from performance monitoring and reports to the Environmental Sustainability Advisory Committee and other key stakeholders.

Potential Next Steps

- Create stakeholder group to prove oversight on plan implementation
- Include key personnel that can make decisions and direct operations
- Meet regularly to review performance metrics and status of actions

Participants

- TRU Ancillary Services
- TRU Housing
- Third-party contractor for North Tower (Campus Living Centres)
- Building maintenance personnel
- TRU Sustainability Office
- TRU Marketing and Communications

5.3.6 Measure performance

Overview

Measuring and tracking performance is imperative in understanding what is working and what may need to be adjusted. Ensure that data is reported back to students living in residences and celebrate achievements by recognizing the gains towards meeting plan objectives. If performance is trending away from targets, the role of the oversight team is to make necessary adjustments to support moving towards targets.

Potential Next Steps

- Implement measures to track waste generated through campus housing
- Perform waste composition audits, consider looking at the types and amounts of waste generated at different stages such as move-out periods vs. regular periods (mid-session)
- Review waste data on a regular basis to ensure accuracy
- Monitor performance against targets and implement strategies to meet performance objectives
- Consider technology such as bin cameras to monitor waste management practices

Participants

- TRU Ancillary Services
- TRU Housing
- Third-party contractor for TRU Student Housing (Campus Living Centres)
- Building maintenance personnel
- TRU Sustainability Office
- TRU Marketing and Communications

Appendix “A”

Zero Waste Plan Stakeholder Survey

1 Introduction

A survey of key stakeholders from campus operations, campus housing and campus construction was conducted following presentations to the groups on the draft zero waste plan. The purpose of the survey was to gauge of the level of support for the initiatives presented in the plan and to get an understanding of the challenges and opportunities for plan implementation.

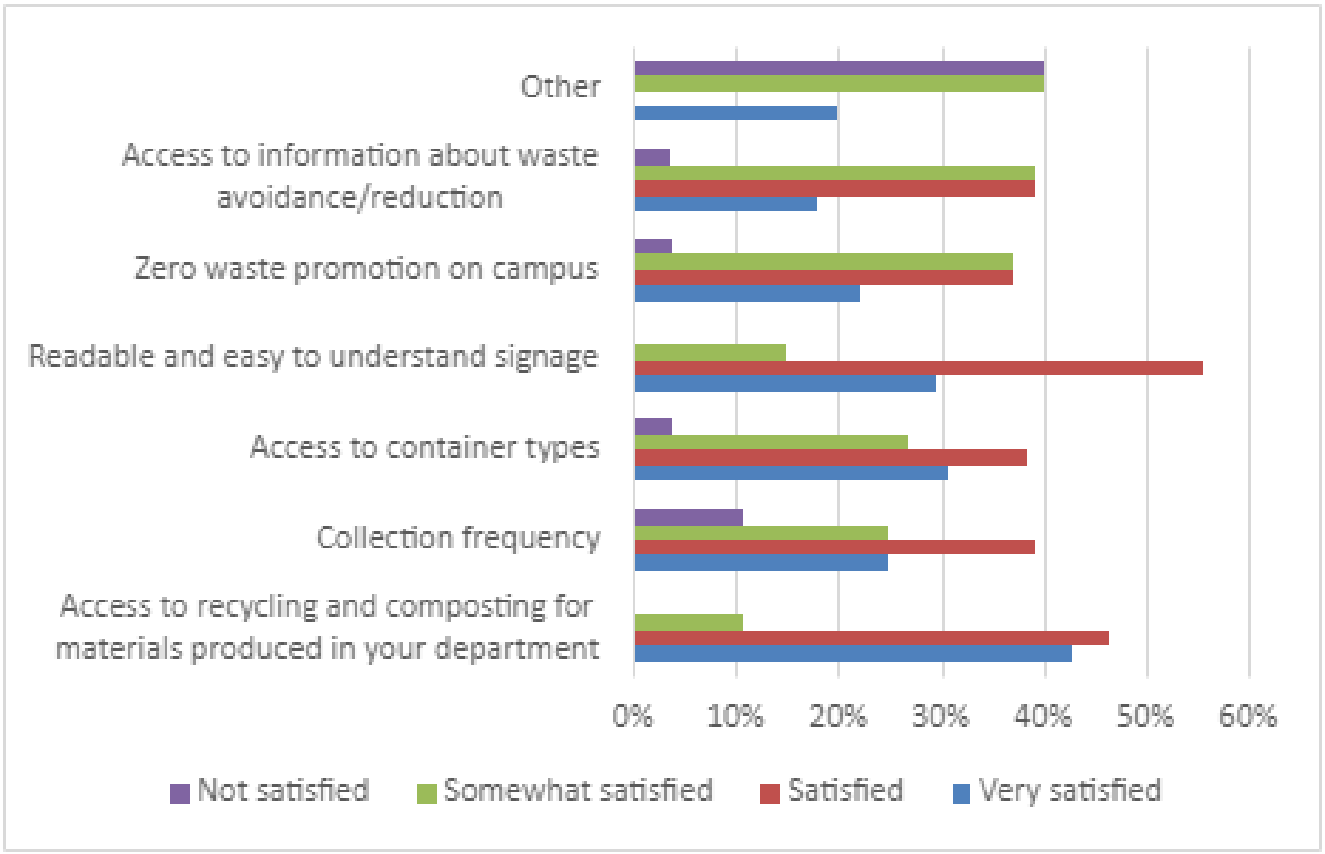
The survey was open from November 2 – 15, 2021, and a total of 27 responses were collected.

2 Current Waste Management Services

Data from questions 1 – 3 shows satisfaction with current waste management services. The data shows relative satisfaction with access to recycling and composting services, access to container types and readable signage. The data shows that there is an opportunity to improve on collection frequency (especially in high-traffic areas), zero waste promotion and access to information about waste avoidance and reduction.

2.1.1 Question 1: As applicable, what is your satisfaction with the current waste management services on campus?

Figure 2-1 Satisfaction with current waste management services



2.1.2 Question 2: If you selected “Other”, specify:

- *There is so much more that could take place (recycling barrel markers for instance; and way better zero waste education)*
- *Students aren't being fully engaged or informed.*
- *Zero waste promotion and waste avoidance/reduction: we need budget holders and leaders at the upper levels (deans, directors, AVPs, VPs, etc.) to act as role models on waste avoidance/reduction. I'd love to see us move away from "We have budget. Let's replace this 3-year-old furniture with new furniture" thinking at upper levels.*
- *More waste stations in heavy traffic areas and parking lots*

2.1.3 Question 3: As applicable, what waste management services would you change and why?

This question received 16 comments, grouped into the following four general categories of 1) improved hauling and collection, 2) improved waste diversion in campus offices, 3) improved education, and awareness for sorting waste at zero waste stations, and 4) increased waste diversion programs across the campus.

Improved hauling and collection:

- Garbage pick-up. It could be changed to have proper containers that can handle the waste and keep the birds and animals out.
- more frequent collection
- Behind the science building by Beam me up Cafe, they removed a dumpster and now there is garbage and recycle spread all over, very filthy mess.

Improved waste diversion in offices:

- Options are great when you go out to the common areas in building but in department offices, it is limited. Our office only has carboard/paper recycling and garbage. So not sure if more info needs to go out to the departments on what options are available for office spaces.
- Overwrap and Styrofoam. They need to be collected without a request for the janitors or Facilities to pick up.
- For the signage, our office has a blue recycling bin and a blue bottle recycling bin. Signage to know what goes in each would be helpful. For example, if we have an empty plastic coffee creamer container, should it go in the city blue bin or the recycling bottle blue bin?
- In the warehouse we have specific wood, metal, and electronic recycling bins. We donate other materials, but we still throw out some material. Would be good to understand all packing materials that come into TRU and how we can better recycle/reuse them.
- I'd love to see something for soft plastics and Styrofoam. I know we have these in a few places, but a few more collection locations would be great.

Improved education and awareness around sorting at zero waste stations:

- I find the zero-waste station too big and confusing for most people. I watch the customers using them in the CATC and most are slightly confused as to the overwhelming number of bins/choices they have. There is also a completely different bin that has been placed in our lobby. I think consistency is key in presentation. The habit is easy to establish if the approach is consistent.
- Need more awareness/ education for international students.

- recycling, we have had zero waste stations on campus 5to 6 years, and we still aren't seeing it being used properly. the recycle bin is always so contaminated with fluids and bags of dog feces. plus, we have added 4 more stations and the blue lidded carts are overflowing while waiting for them to be sorted.
- increased information and promotion re zero waste

Increased diversion programs:

- We need: Paper-only recycling; shredded paper audit; barrel marker recycling; cigarette butt recycling; pallet wrap recycling; paper towel composting; drywall recycling; garbage mining; etc.
- Separating out office paper from main recycling bins. A campus-wide laundry service for towels so that we can use towels in staff kitchens and washrooms rather than paper towel. Including recycling for plastic wrap and other plastics that can't go in the bin.
- doggy doo waste bins to stop those who do not pick up after their dogs. lots of big dog doo on our lawns
- more and better! :)

3 Initiatives for Campus Operations

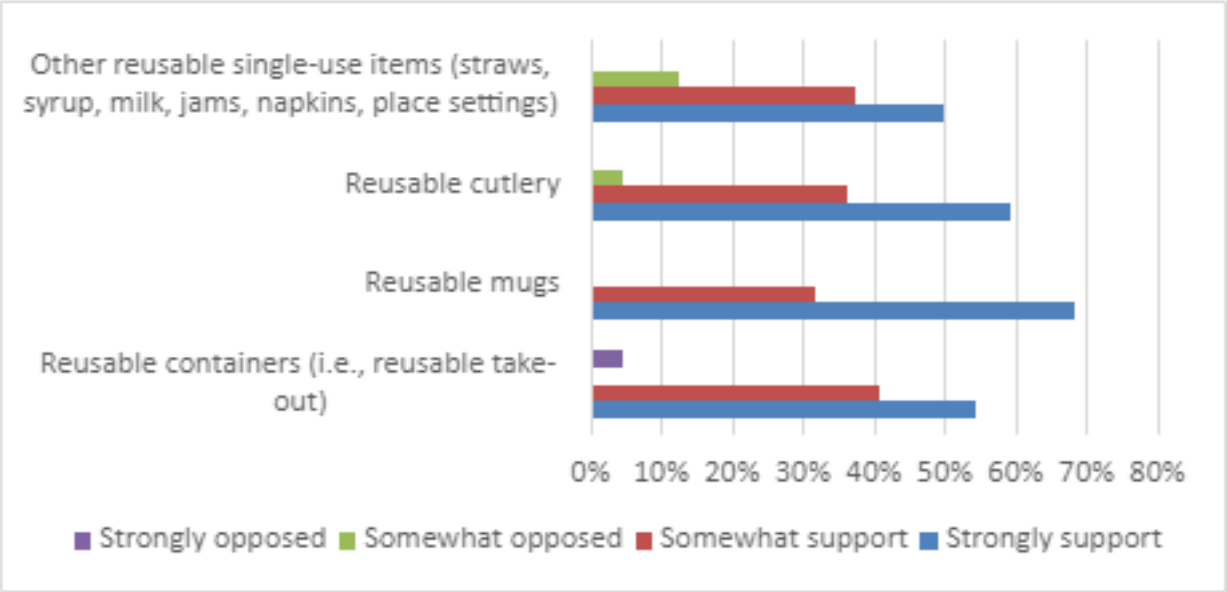
Questions 4 – 14 show the level of support for zero waste plan strategies for campus operations**,** including reduction in single-use items (questions 4-6), food waste prevention (questions 7-8), reuse and repair initiatives (question 9-11), and increased waste diversion (question 12-14).

3.1 Single-Use Item Reduction

Data shows that there is strong support for shifting to reusables across all packaging types (mugs, containers, and cutlery), with suggestions to include reusable napkins, straws and refillable pens.

3.1.1 Question 4: Reducing/ eliminating single-use items (cups, containers, cutlery) by moving to reusable options is a way that universities have successfully reduced waste and costs associated with procurement, handling, and disposal. What is your level of support for shifting to reusables in the following categories at TRU?:

Figure 3-1 Level of support for shifting to reusables



3.1.2 Question 5: If you selected other reusable single-use items, specify:

This question received six comments, however three of the comments were around challenges and are included in the summary in question 6. Suggestions for other reusable single-use items include straws, stationary, sanitizing supplies, and catering items.

- Could have their own metal or reusable straws
- Stationery purchases - Procurement policy should prohibit use of single-use pens in favour of refillable pens. We could also be looking at more sustainable options for whiteboard markers, etc. An audit of stationery purchases would reveal quite a lot of waste. Lysol wipes - soooo many of these! Once we are through the pandemic, we could move to a system of refillable spray bottles and cloth wipes (which could be washed in campus-wide laundry system, or source certified compostable wipes).
- Catering items (place-settings, napkins, etc)

3.1.3 Question 6: Why did you rate your level of support this way in question 4? What challenges would you anticipate and how would you suggest overcoming them?

This question garnered 16 comments, which can be summarized into challenges around access to washing stations, storage for reusables and aligning with franchise contracts, concerns around behaviour change, costs and health and safety.

Access to washing stations, storage and aligning with franchise contracts:

- Challenges of cleaning re-usable items. Overcome by installing more wash stations.
- Not sure how practical it would be to wash items for reuse
- If we have re-usable items, we need a place to WASH them after eating.
- People cannot and will not bring in reusable containers for the syrupy/milk and ice drinks served at places like Tim's or Starbucks.

- There are a few challenges. - The main challenge is that we don't have a dining hall which is where a reusable system would work properly. - There need to be buy in for this program so something similar to Ozzie may be a better option than the reusable program we had before. The students and staff that want to participate would pay into the program which would give them incentive to use the program properly - Franchise locations have their own sustainability goals and often do not align with what we are doing. So sometimes it can be hard to get them on board with something like this. And we are unable to bring in something that is not approved by the franchise as we run the risk of failing an audit and being closed for not complying with franchise standards. - Cleaning of the reusable items is difficult as we do not have dishwashers at all locations. If TRU invests in an Ozzie program this is going to have to be something to think about as the dirty items will need to be transported to a location where a dishwasher is located.
- The challenges would be to keep these items clean and have a space to clean them.
- I anticipate challenges for accessible cleaning stations for reusable containers and cutlery. A solution would be to create cleaning stations close to food retail outlets. The other potential barrier is people remembering to bring their own mugs and cutlery. I'm not sure how to overcome this--it will take time for people to get used to it. Perhaps charging more for disposable cups and cutlery would help?

Behaviour change:

- I do not think people will use re-useable containers and if we buy them and provide them to students and employees it's a big waste of money.
- eat out is not always planned and as such you do not always prepare to come with cutlery etc.
- I would prefer a compostable container to a reusable container for take-out. I already have reusable mugs, cutlery, and other items at work. I do not do a lot of take out...maybe once every 2 months...I would find it inconvenient to return the container and I do not want to collect any more containers to keep. I feel I would throw the reusable container into the recycling/garbage. If the container could be compostable that would be best for me. Or providing the option of a reusable food container or a compostable one.

Costs:

- I support it but there needs to be some flexibility for those who need a non-reusable option. The reusable option should not cost more
- Generally, I support this, but it should be noted that just because we are saving money in procurement, that does not mean it is cost savings. Labour cost, depending on how we move forward is an important consideration on campus especially for programs with limited budgets.

Health and safety:

- I try to re-use whenever possible in my personal life (for example, filling Tupperware containers as part of the refill program at Bulk Barn). I am fully in support of reusing mugs, containers, etc. but many challenges exist. For example, with health & safety policies, is it even possible for me to bring a reusable mug or container to the food services on campus and use it? During COVID, almost everything moved to single use... do policies on campus allow for reusable mugs to be used during the pandemic?

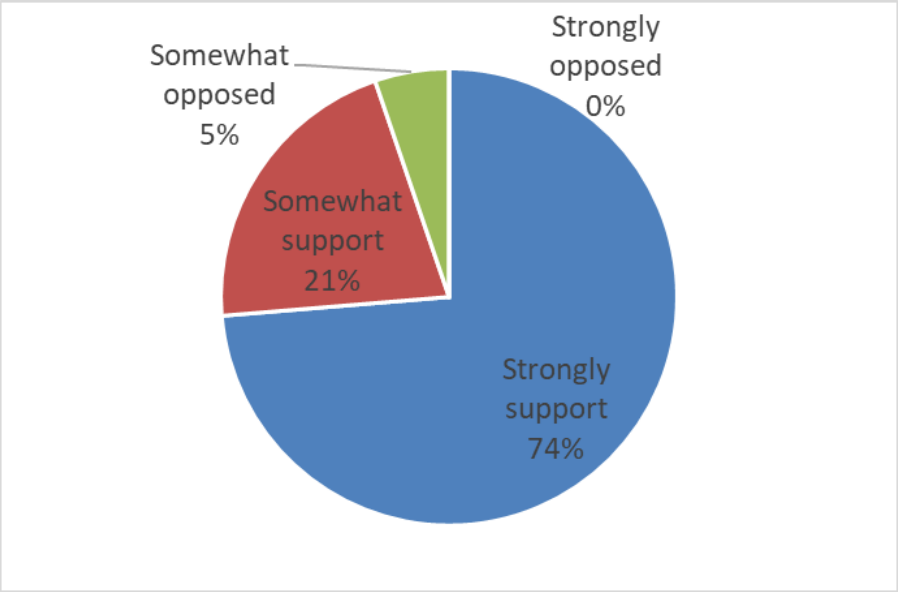
- Same as stated as above. It is not sanitary or practical to bring reusable containers for the drinks being served.
- Sanitization
- Covid poses challenges, finding the right system for reusable mugs and containers
- Just time, money and human resources needed
- The goal is to reduce as much as possible or explore other options for disposable items that are more in line with sustainable practices.
- With COVID, I am hesitant to use reusable when cafes are involved. If I am making my own coffee and can ensure everything is cleaned before use, that is fine.

3.2 Food Scraps Prevention

The majority of respondents support food scraps prevention, however based on the feedback in question 8 regarding anticipated challenges, there is a need to clarify food scraps prevention with stakeholders. The intention of the strategy is to reduce the amount of food scraps that become waste rather than increase diversion of scraps to food or compost.

3.2.1 Question 7: A significant amount of food is wasted at various stages of food services (spoilage, overproduction, spills, plate waste). What is your level of support for a food scraps prevention action plan for campus food services?

Figure 3-2 Level of support for a food scraps prevention



3.2.2 Question 8: In question 7 above, you indicated your level of support for implementing a food scraps prevention strategy for campus food services. Why did you rate your support this way? What challenges would you anticipate and how would you suggest overcoming them?

This question received 16 comments. The most common general comment was that groups are already composting and there is a need for frequent collection of food scraps. There were also comments about food insecurity among students, issues with managing contractors to follow food prevention strategies, and health and safety concerns.

Already compost, frequency of compost collection:

- It needs to be easy and picked up regularly because otherwise it begins to smell, and people will not participate.
- Holding wasted food in storage. Frequent removal.
- I rated it as such because up to this point the sustainability department has not handled the garbage and food waste very well. It is dirty and not very well controlled.
- Food rotting before it can be recycled
- In the CATC we have dramatically reduced our waste through recycling, composting, providing meals to students, and limiting production. If there is a way to divert any other products from landfills, we would welcome the discussion.
- We have implemented food waste at all retail locations to be composted. The kitchen currently composts all food production wastes and we are going to be meeting to discuss composting in catering. So not sure what else can be done.
- Collection, process for collection and the volume of collection.

Food insecurity among students:

- Students are experiencing food insecurity. Food waste in this context is absurd
- I hate to see how much food is thrown out after catered functions. I know some of our students access the food bank through TRUSU and I would love for us to be able to stream leftovers to students who need them.

Managing contractors:

- Because it makes sense to have an action plan in place. Depending on what the action plan covers, there could be challenges with the food service areas abiding by new rules.
- I see overages in food at all the catered events that I've been to on campus. While I know they are trying to ensure there is enough food for everyone, it's incredibly wasteful. Challenges would arise on the management side for ancillary services as they would have to be the ones driving the education and change.

Prevention strategies:

- More items made fresh to order. Meal size options. For those with smaller appetites', having a half size order so all food is consumed. Composting scraps.
- As stated above: "A significant amount of food is wasted at various stages of food services (spoilage, overproduction, spills, plate waste)."

Health and safety:

- Working within the gov't safety regulations
- Again, ensuring sanitization and human safety

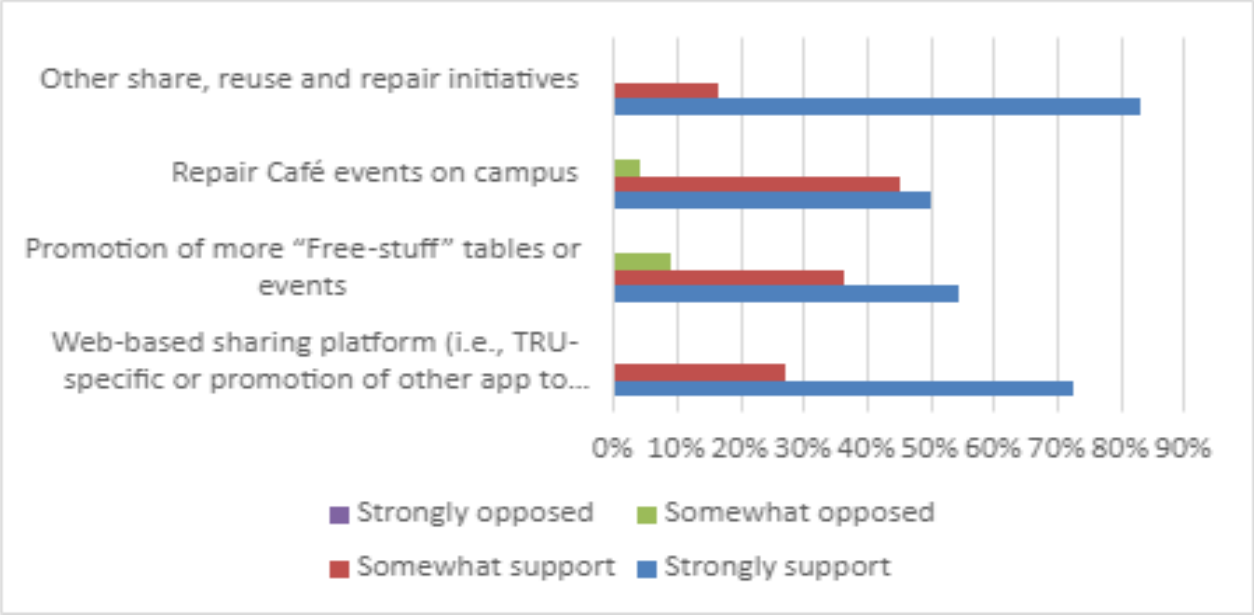
- How to deal with moving food safely from user to user (dealing with food handling regulations). How to maintain a viable financial model (re not giving food away for free)

3.3 Share, Reuse and Repair

Data shows that there is strong support for strategies to increase the life of durable goods on campus through share, reuse, and repair initiatives, with a web-based sharing platform garnering the most support.

3.3.1 Question 9: Share, reuse and repair of durable goods used on campus is another strategy that can help keep durable goods out of landfill. Web-based sharing platforms, "Free-stuff" events and tables, and Repair Cafes are examples of how to increase life of durable goods used on campus. What is your level of support for implementing share, reuse, and repair actions at TRU?

Figure 3-3 Level of support for share, reuse, and repair initiatives



3.3.2 Question 10: If you selected other share, reuse and repair initiatives in question 9 above, specify:

- Building the reuse and repair into purchasing decision making is important. By asking the vendors up front if parts are replaceable or there is a re-use program at the end of its lifecycle, could have an influence on the purchasing decision.

3.3.3 Question 11: In question 9 above you indicated your level of support for share, reuse, and repair strategies on campus. What challenges would you anticipate and how would you suggest overcoming them?

This question garnered 12 comments. Most of the comments were around resource and costs needed to manage the initiatives. There were also comments about education and behaviour change, as well as health and safety.

Resources and costs:

- Not only does it help with making items last longer, but it could also build student networks. Potential challenge finding a space for it?
- The amount of work it takes to organize such an event
- Staff Involvement in keeping free areas clean during and after the event. What is done with items that no one takes?
- Human resources: a bit of needed furniture to hold the stuff; how to deal with the move-out situation when students leave campus in the spring and toss their stuff in the landfill (work with x3 residences)
- They would be too time consuming and hard to manage. we have a Reuse site and that can be difficult to deal with at times.
- Management of this type of program
- Having the peoplepower to oversee these initiatives is needed.

Education and behaviour change:

- More educational tools
- Challenge getting students & employees to remember to bring their containers in
- The more initiatives the better! As the saying goes," if nothing changes, nothing changes".
- Web-based sharing platform could even be a Facebook group to encourage "swapping" of goods - there are lots of examples already existing.

Health and safety:

- COVID and health guidelines.

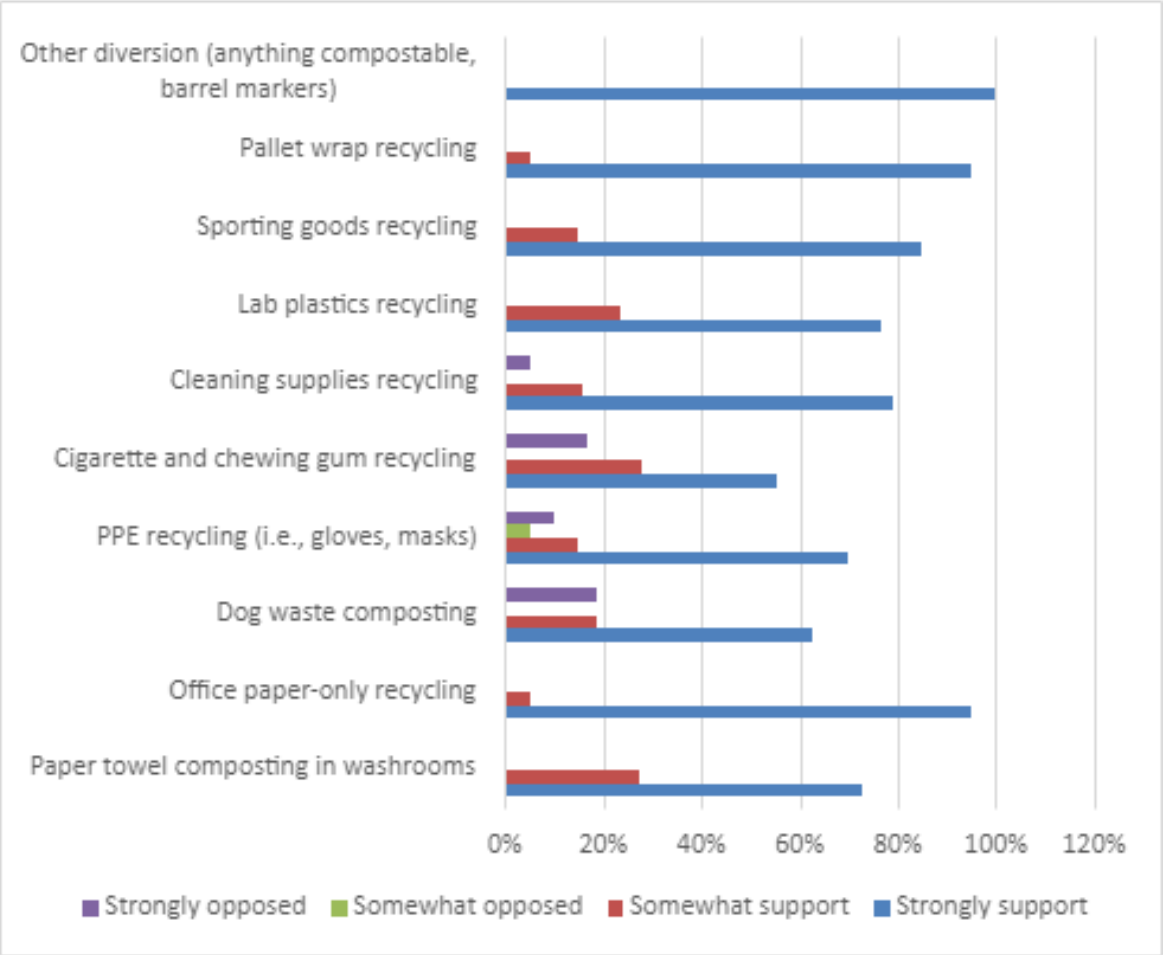
3.4 Expand Waste Diversion Initiatives

Data shows there is strong support for increasing the number of material streams diverted on campus, with pallet wrap recycling, office paper only recycling, sporting goods recycling, and paper towel composting garnering the highest level of support. There was some opposition towards diversion of dog waste, PPE, and cigarette and chewing gum recycling, with suggestions to include pen and marker recycling.

Several challenges were brought forward with implementing new recycling programs, including costs, resources, management of the materials, and the ensuring proper use of the programs through education and communication.

3.4.1 Question 12: Improving current and implementing new waste diversion (recycling/ composting) programs is being considered as a future opportunity in TRU's zero waste plan. What is your level of support for the following waste diversion programs?

Figure 3-4 Level of support for the new waste diversion programs



3.4.2 Question 13: If you selected other recycling/ composting initiatives, specify:

- Any compostables that can be handled
- TRU contracts a company to make recycled clothes, bags etc. that TRU purchases
- Barrell markers, pens, pencils
- Yes!!!

3.4.3 Question 14: In question 12 above you indicated your level of support for new recycling programs on campus. What challenges would you anticipate and how would you suggest overcoming them?

This question received 12 comments. The most common response was around resources, management of the materials and costs. Other responses were around education and awareness, and access to viable markets.

Resources, management of material and costs:

- Possibly have outside people that have the experience and commitment to managing some of these waste and composting issues.
- management thereof

- Peoplepower needed!!
- money, time, human resources; and markets
- need separate containers and they need to be picked up regularly. Signs need to be in place as well.
- Space for collection, costs of collection and processing. Education is key so invest in people around campus that this is a side role to their main position and compensate them for their efforts…
- Costs...? Concerted efforts to partner with corporations that benefit from exposure to TRU efforts

Education around sorting:

- It makes sense to recycle everything. Challenges would be people abiding by it and putting things in the correct bins (we have that issue now at TRU).
- Communicating the details; there are a lot of items listed, would they all be recycled together? Ensuring communication is simple but clear and can be easily understood and implemented.
- Educating people in proper disposal of the items like gum, dog waste and protecting workers who have to deal with these items.

Markets:

- Finding a Canadian company that recycles plastics into re-usable items

Other:

- Office paper - I don't understand what exactly this is referring to.

4 Strategies for Campus Housing

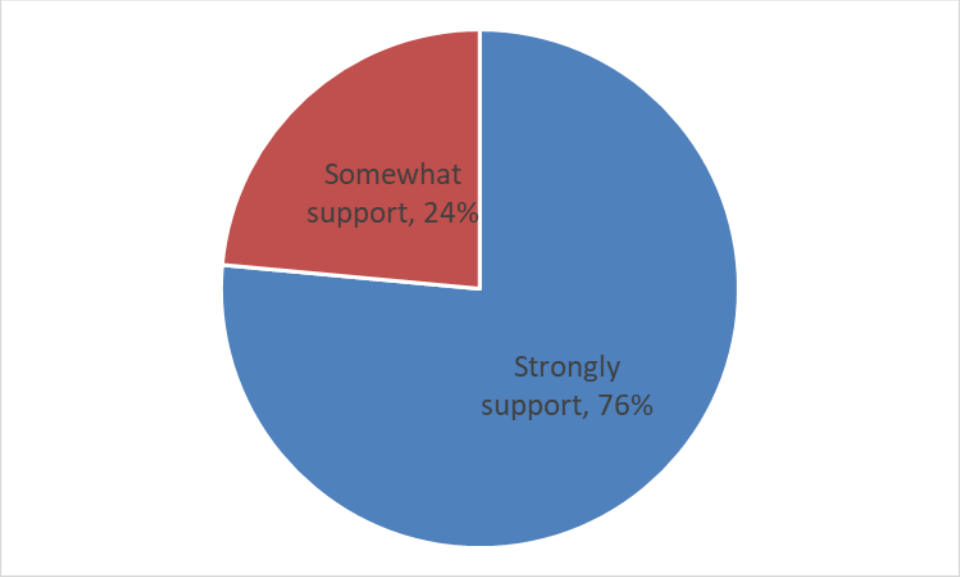
Data from questions 15-19 show the level of support for plan strategies related to campus housing, including food scraps diversion, and share, reuse and repair initiatives. The data also shows the potential challenges and solutions for implementing the strategies to continue to support increased capture.

4.1 Food Scraps Diversion

There is strong support for implementing food scraps diversion in campus housing, however several challenges were identified. Ensuring student buy-in and use of the program was identified by many respondents, thus a robust education and communication plan would be needed to successfully implement such a program. Learnings from the pilot program in the McGill residences will be helpful. Space for collection bins was identified for one of the buildings, as well as the need for dedicated staff to support the program.

4.1.1 Question 15: Food waste diversion has the potential to significantly reduce waste to landfill and the greenhouse gas emissions associated with landfilling organic waste. TRU has recently implemented food waste diversion in the McGill Residence. What is your level of support for expanding food waste diversion in all campus housing?

Figure 4-1 Level of support for expanding food waste diversion in all campus housing



4.1.2 Question 16: In question 15 above, you indicated your level of support for expanding food waste diversion to all campus housing. What challenges would you anticipate and how would you suggest overcoming them?

- More educational tools
- The challenges would be the same as elsewhere on the campus, it most likely will turn into a mess. There needs to be a committed and dedicated staff
- Students being aware of organic composting program
- Communication and involvement from the students. Make the communication clear, simple and easy. Incentivize the students: either reward based or emotionally based, what's in it for them? Unfortunately, many students are unwilling to fully participate without some personal benefit.
- waiting on outcome of McGill pilot, then moving to East Village and North Tower
- It really depends on if the other campus housing buildings have an appropriate space to put a composting bin, for example. Ideally it would have to be in a space that doesn't disturb the usual operations of the buildings or the staff/residents experience.
- Compliance could be an issue. This can be overcome through education.
- Getting buy-in from students. Would need an annual education program for students so they know how to compost.
- The right process and education around composting need to be in place. Each residence is unique and operates differently, so that would need to be taken into consideration.
- Peoplepower needed!!!

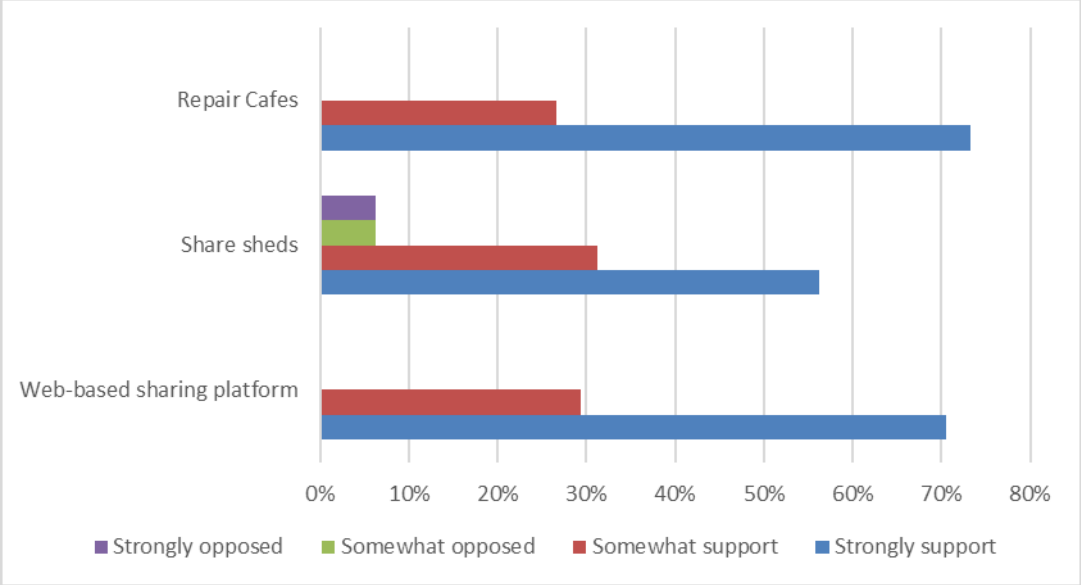
4.2 Share, Reuse and Repair in Campus Housing

Data in questions 17-19 show that there is strong support for extending the life of durable goods in campus housing through share, reuse and repair initiatives, with a web-based sharing platform and repair cafes showing more support than share sheds.

The challenges identified with these initiatives were primarily around awareness, management of the programs, and space (for share sheds).

4.2.1 Question 17: Share and reuse of durable goods in campus housing keeps usable items out of landfill and reduces demand and consumption of new goods. Campus residences have systems in place to support share and reuse, however the zero-waste plan identifies share, reuse and repair as an opportunity reduce waste. Web-based sharing platforms, share sheds and Repair Cafes are examples of how to increase life of durable goods in campus housing. What is your level of support for implementing share, reuse, and repair actions at TRU?

Figure 4-2 Level of support for share, reuse, and repair in campus housing



4.2.2 Question 18: If you selected Other share, reuse and repair actions in question 17 above, specify:

- *Smaller share bins over a share shed.*
- *all of them*

4.2.3 Question 19: In question 17 above, you indicated your level of support for share, reuse, and repair actions in campus housing. What challenges would you anticipate and how would you suggest overcoming them?

- More educational tools
- Again, space and management of the areas.
- There would be a space issue and possibly a safety /liability issue for things being repaired.
- getting students to bring items in (have it in the foyer of residences once a month)
- I would support smaller drop off bins over a share shed as a share shed is just too large and will create an area with limited visibility that someone could hide behind. So, mostly influenced from a safety perspective.
- Need to constantly re-educate new students on protocols, making it easy and convenient for users

- I would need more information on what these types of programs would look like and how they would be administered, monitored, and ran.
- Peoplepower needed!!!

5 Strategies for Campus Construction

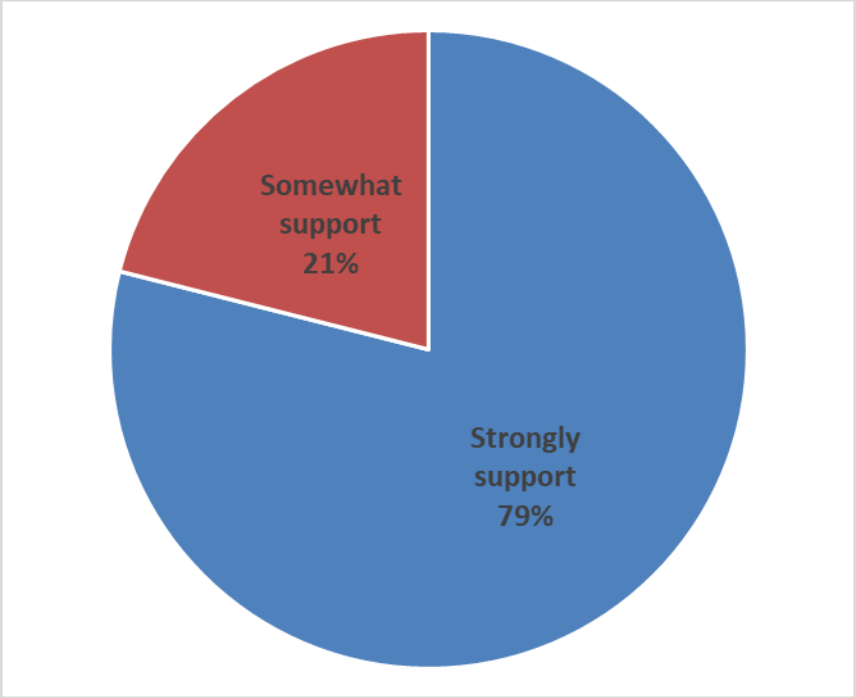
Data from questions 20 – 23 show the level of support for plan strategies related to campus construction, as well as the potential challenges and solutions for implementing the strategies.

5.1 Construction Waste Diversion

Construction waste diversion is strongly supported by respondents. The main challenges brought forward by stakeholders were around the ability to divert certain types of construction waste (drywall), ensuring that contractors are separating waste, and that the system is cost effective and efficient. Solutions included incorporating construction waste diversion processes into contracts, and having staff that can monitor the process.

5.1.1 Question 20: Construction waste diversion keeps valuable resources out of landfill, reduces demand for virgin/ raw materials and increases the supply of materials used in construction. TRU has several buildings, which have diverted significant amount of waste. Diverting waste from all campus construction and renovation activities has been identified as a strategy in the TRU zero waste plan. What is your level of support for construction and renovation waste diversion?

Figure 5-1 Level of support for construction and renovation waste diversion



5.1.2 Question 21: In question 20 above, you indicated your level of support for diverting waste from construction and renovation activities on campus. What challenges would you anticipate and how would you suggest overcoming them?

- the items could be available outside for anyone to just go a pickup. It needs to be easy
- Find markets in region
- Our current challenges are that the city doesn't have programs in place to recycle our top landfill item: drywall. So, we are on-board to proceed with it if there is a program in place via the city or otherwise.
- Concern over the efficiency of process. Build these individual processes into contracts so there is time and funding already budgeted.
- Challenges would exist throughout - from including this in purchasing documents, to selecting a vendor who can provide this, too - more importantly - having someone to monitor and do quality checks to ensure it is happening.
- I support recycle and diversion however the city and government programs fall short. In many instances items are not accepted.
- getting contractors aware of zero waste and supporting this initiative
- Most items can be recycled in some way at a cost or be donated. Wood can be used to build roads. Some furniture/appliances can be donated to Habitat. Items could also be placed on Let Go or Facebook Marketplace.
- making sure any new systems are not cost prohibitive.
- Getting buy in from private contractors
- strong system already in place
- How to deal with drywall!

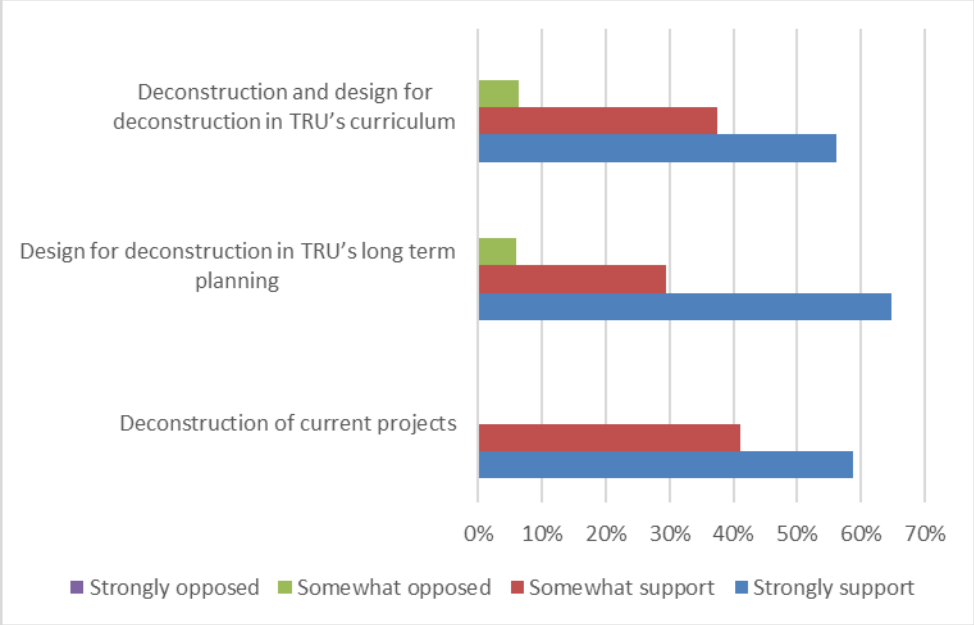
5.2 Deconstruction Strategies

There is generally support for deconstruction strategies, with the strongest support around deconstruction of current projects. There was some opposition to designing for deconstruction TRU's long-term planning and incorporating deconstruction into TRU's (trades) curriculum.

Cost was identified as a key challenge by many respondents. Better building practices and design to maintain spaces that can be multi-functional, rather than building new was presented as a solution to overcome challenges of cost.

5.2.1 Question 22: Deconstruction is an innovative approach that can see up to 80 percent of buildings materials be diverted to reuse and recycling. Deconstruction of current projects, designing for deconstruction in TRU's long term planning, and incorporating deconstruction and design for deconstruction in TRU's curriculum have been identified as opportunities to advance the circular economy at TRU. What is your level of support for deconstruction and design for deconstruction at TRU?

Figure 5-2 Level of support for deconstruction and design for deconstruction



5.2.2 Question 23: In question 22 above, you indicated your level of support for deconstruction and design for deconstruction at TRU. What challenges would you anticipate and how would you suggest overcoming them?

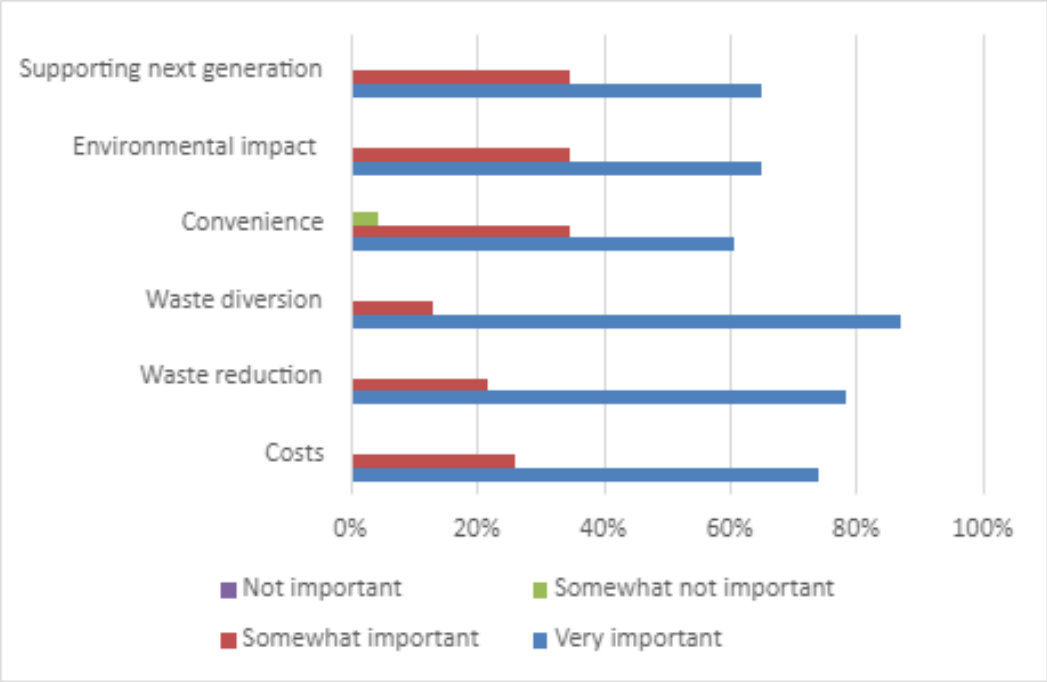
- Costs
- Added costs
- How to do so in a financially viable way.
- Challenge is cost as well as communicating to contractors. Deconstructing (as opposed to demolition) is more expensive, although cheaper because we would be re-using materials. A challenge would be communicating this to whoever is paying for a project.
- TRU's curriculum?? I think it's more about establishing practice and creating culture around certain activities.
- Just need to know more about this topic.
- There needs to be a dollar value put on initiatives like this. It would be easier to find more environmental products. The cost increases from something like this is what drives up the costs of construction. The solution is better building practices and maintaining spaces rather than deconstructing and building new. Also build in a way which the spaces could have multiple functions
- Finding solutions to recycle or reuse items such as drywall...this was mentioned in the presentation. I am not knowledgeable on the topic, but I read online that old drywall can be added to concrete. I also read it is compostable.
- I think having an expert(s) in this field to do workshops during the quieter times of the year would be great.

6 Priorities and Planning Considerations

Questions 24 – 27 shows the priorities and planning considerations for the zero-waste plan. Decreasing the amount of waste going to landfill was the top priority for stakeholders, followed by reducing the amount of waste generated on campus, and keeping costs of waste management low. Supporting next generation and reducing GHGs were also important, while convenience was the lowest rated priority.

6.1 Question 24: Rate the following considerations for level of importance

Figure 6-1 Plan priority considerations



6.1.1 Question 25: What else would it take to make TRU a zero-waste community?

This question received 15 comments. Most responses were around getting buy-in across the TRU community, with several comments about education and awareness. There were also suggestions to ensure adequate monitoring, resources, and safety, and taking personal responsibility.

Broad-scale engagement:

- Buy-in from staff, faculty, and students!!
- This is a good start. Opportunity will present itself.
- It would take the entire city's commitment. It would take the international community to also commit
- Everyone buying into the concept
- Those in leadership roles demonstrating zero waste practices - making sure that sustainable purchasing practices are in place in their departments, hosting low/zero waste events, asking whether departmental practices are sustainable, encouraging staff to choose reusable items,

etc. If sustainability practices are clearly promoted by the executive, they are more likely to be adopted.
- 100% participation

Education and awareness:

- Education and participation by the entire community
- Awareness campaign. People need to know what their role is and how they PERSONALLY can make a difference.
- Do a better job at orientation so that new staff and students understand all systems right away
- Fully engage students in recycling and garbage reduction as that is not the case currently.
- Peer-to-peer education

Other (monitoring, resources, safety, and personal responsibility):

- More monitoring of waste landfilled
- Money. Almost anything is possible if money is not a factor. There is probably an initiative that could address any waste problem if money is not a big consideration.
- Safety needs to be ensured first
- take your personal waste home if possible and deal with it

6.1.2 Question 26: What initiative are you most passionate about moving forward and why?

- paper, overwrap, Styrofoam because that affects my office the most
- I'm passionate about sustainability - more specifically climate change & the associated impacts (taking my MSc in Environmental Practice).
- Reusing and repurposing
- Repair and reusing initiatives.
- Wind, Solar, Green Energy to save the planet and reduce use of fossil fuels!
- Zero waste with construction and deconstruction. As TRU grows and ages construction will undeniably happen. Doing the right thing and not creating waste during this process would be a huge benefit.
- Free stuff initiatives; better use of existing programs (keeping paper dry)
- getting through to students as to what should be recycled signage isn't working.
- reduce, reuse, recycle
- No longer offering single-use coffee cups and other food serving items. Besides reducing waste, students who spend four years without single-use items on campus would be more likely to adopt zero-waste practices after they leave school.
- Cleanliness of TRU - right now there is waste and recycling in overflowing containers, this needs to be upgraded
- Buy-in for this 5-year zero waste-plan (in Jan 2022)

6.1.3 Question 27: What needs to be in place for moving this plan forward (e.g., policy, resources, expertise)?

- plan for pick up, signage, collection bins
- Policy, resources, information, and buy-in from all levels that this is important and needs to be accounted for in all aspects of the university.

- All those items.
- Manpower to manage and ensure the policies/resources/etc. are being utilized and impacting change. Creating documents and policies won't ensure change, but having people champion it and dedicate their time to ensure the changes are occurring will.
- policies, experts, connection to students and employees. Its everyone's responsibility not just ESAC
- Contingency to have the resources available to make this happen. To have a policy that does not limit the work from being done, just how it is done.
- human resources and money and time
- need more manpower labor to deal with the increasing garbage and recycling/which needs sorting right now as it's so contaminated.
- yes, all of the above
- Procurement policies that restrict the purchase of new items within a certain time (e.g., furniture). Procurement policies that restrict single use items.
- Resources and education and support for the departments and areas that are executing sustainable initiatives. Also funding if needed.
- It appears right now that TRU jumps to try something as far as recycling goes but does not consider the long-term ramifications. More communication and discussion with stakeholders are paramount.
- A good engagement event (in Jan 2022 - with free stuff!)

6.1.4 Question 28: What do you do in your day-to-day to reduce waste?

- recycle at home...bring my food wastes home
- Constantly look for new ideas
- I re-use water bottles, cutlery, chopsticks, have a zero waste station at home (sort my own recycling), use the zero waste stations at TRU, bring my own bags to grocery stores, etc.
- Everything I can.
- Reuse (containers, coffee mugs, etc.), reduce consumption (e.g. meal plan to ensure only groceries that are needed are purchased), buy 2nd hand (clothes, toys, sporting equipment), repair when possible, grow our own garden produce, etc.
- I do what the city asks. I divert what construction waste is possible. I try to make greener choices
- If we have excess usable furniture, we reach out to local not for profits to see if they can use it.
- Recycle as much as I can at home and work!
- Use reusable containers, utensils, mugs, etc. at work. Meal plan and make me the correct sized portions. Freeze portions to use throughout the month. Freeze items I don't think I will consume on time. Try to purchase items with less packaging, example: shampoo bar that is stored in a reusable tin.
- not much... :)
- I only buy what I can eat and drink so I am not wasting food and I dispose of any containers in the proper bins so as not to contaminate everything.
- reduce, reuse, recycle
- Avoiding products that are over-packaged or that come in non-recyclable packaging. Using own cup, container, and cutlery where permitted. Composting. Buying local. Buying higher quality

things and keeping them longer. Reusing things for as long as possible before buying new things. Choosing products that can be recycled or composted over products that must be thrown away.
- re-usable items and recycling
- Reusable containers, PPE, food composting etc.
- lots! :)

6.1.5 Question 29: What is your role with the university?

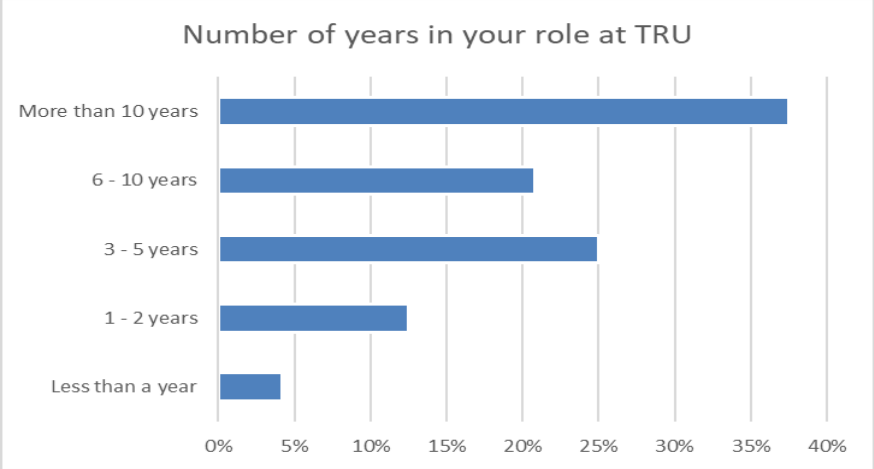
21 respondents answered this question, showing a variety of stakeholder representation including several managers, faculty, administration, department chairs, marketing, procurement, housing, sustainability, and construction.

- Manager
- manager
- Consultation
- Manager, Facilities Services & Capital Projects
- instructor
- Administration
- Dept chairperson
- Procurement Services
- construction
- Procurement Services
- Administration
- Campus Housing
- Sustainability Office Grand Fromage
- Housing / Sales
- Utilities Coordinator
- Faculty
- Chairperson, School of Trades and Technology, Carpentry Instructor
- Marketing & Communications
- faculty

6.1.6 Question 30: How long have you been in this role?

This question received 24 responses. Nearly 60% of respondents have been in their role for six or more years. A quarter of respondents have been in their role for 3-5 years, and less than 20%, two years or less.

Figure 6-2 Length of service for plan stakeholders at TRU



Appendix “B”

Zero Waste Plan Stakeholder Workshops Session Summary

1 Introduction

Three workshops were held with zero waste plan key stakeholders in January 2022. Workshops were led by Tamara Shulman and Associates, with support from Marcia Dick. Separate workshops were held for campus operations, campus housing and campus construction and renovation. The goals of the workshops were to build an understanding of the zero-waste plan and stakeholder roles within the plan, and to consider implementation factors including priority ranking, timeline and resources needs.

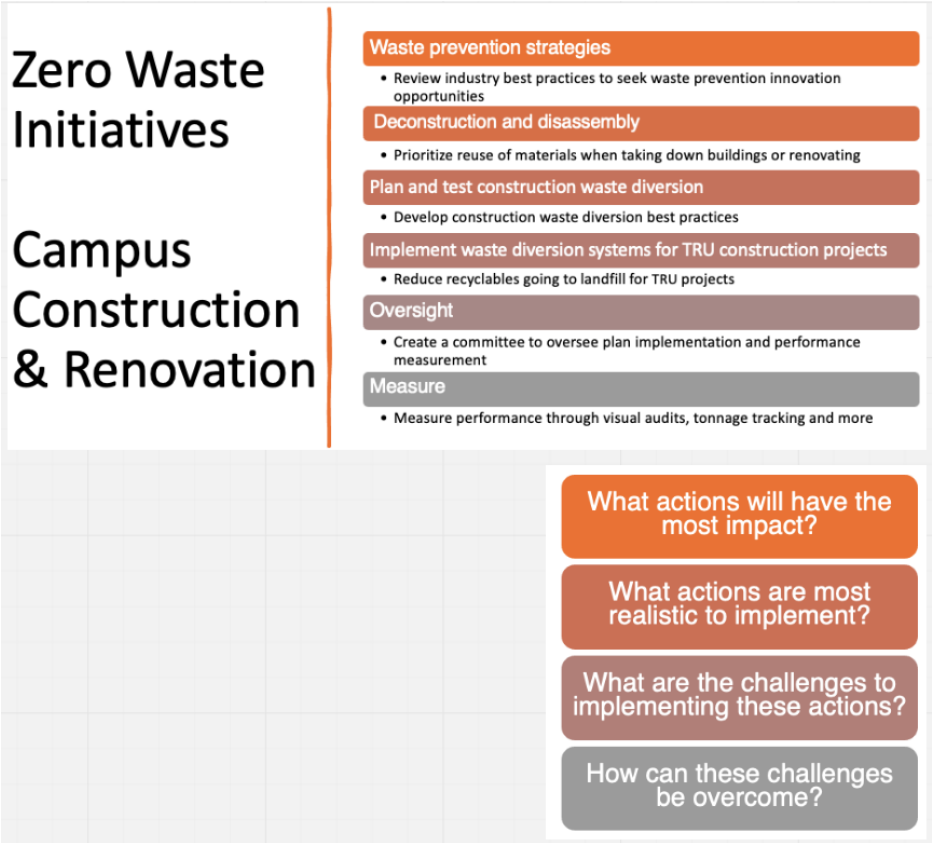
Each session included time for introductions, where each person shared their "zero-waste superpower". Introductions were followed by presentations which included the zero-waste context, a system overview and assessment, and the sector-specific proposed initiatives. After a short break, stakeholders were invited to participate in a brainstorming session using an online whiteboard (Miro).

Brainstorming sessions included two main activities. The first was discussions around plan actions opportunities, challenges, and solutions. The second activity was an impact assessment of the actions, assessing each action for level of effort (cost to implement) against level of impact (reduction of garbage).

2 Campus Construction and Renovation

The first of the engagement sessions was for the campus construction sector. Figure 2-1 shows the sector-specific initiates presented in the plan as well as the discussion topics.

Figure 2-1 - Zero Waste Initiatives and Discussion Topics for the Campus Construction and Renovation Sector



2.1 Construction and Renovation Sector Actions, Opportunities, Challenges and Solutions

The discussion in this this sector was around actions for drywall recycling, modular building, building codes, aggregates, energy management, and measurement and tracking. Table 2-1 summarizes the discussion for this activity.

Table 2-1 Construction and Renovation Actions Table

Action Type	Opportunities	Challenges	Solutions
Drywall recycling	- high volume, important to divert - partnerships	- end markets - cost - storage	- partnerships with large producers, haulers, and local government
Modular building	- new builds	- how does it fit for renovations?	
Building codes	- government/ professional led - resources across sectors including public to assess - get buy-in to switch to recycled content items - e.g. paper-based or reusable drywall, composite studs	- not set-up to support disassembly	- adjust code? - product development
Aggregates	- optimize diversion - quantify - diversion opportunities (when smaller quantities) - private disposal (cost)	- private disposal (accountability, tonnage)	
Energy management	- electric (e.g., heat pumps) so transition to renewable - source priorities?		
Measurement and tracking	- how to create simple systems? - build off successes for metrics	- if too complex, hard to follow and manage	

2.2 Construction and Renovation Sector Impact Assessment

The impact assessment activity for the construction sector placed the actions on a matrix assessing the level of effort (or cost to implement) against the level of impact (or reduction in garbage tonnage). This matrix is shown in Figure 3-2 below and can help to prioritize activities[29].

[29] Mind Tools. The Action Priority Matrix, https://www.mindtools.com/pages/article/newHTE_95.htm

The Action Priority Matrix groups activities into four quadrants: “quick wins” are actions than fall in the lower right quadrant, which have high impact and require low effort. These are actions that should be prioritized. “Major projects” are in the upper right quadrant, and are activities that have high impact, but require a high level of effort. “Fill-ins” are actions in the lower left quadrant, which have low impact, but which require low level of effort. “Thankless tasks” are actions in the upper left quadrant, which have low impact and require a high level of effort.

A quick win action for the construction sector is drywall recycling for new drywall if there was a market. Because there is currently no local market for drywall recycling, a priority for this sector is to develop partnerships with large producers, haulers, and local government to overcome the challenges of end markets, cost, and storage.

Aggregate recycling is another action with relatively low effort, but lesser impact than drywall recycling, and presents potential action for priority consideration. Discussions around the challenges for accountability and low tonnages during the stakeholder engagement session requires further investigation. Solutions to overcome accountability and low volumes for aggregates should be a priority area of focus for the oversight committee.

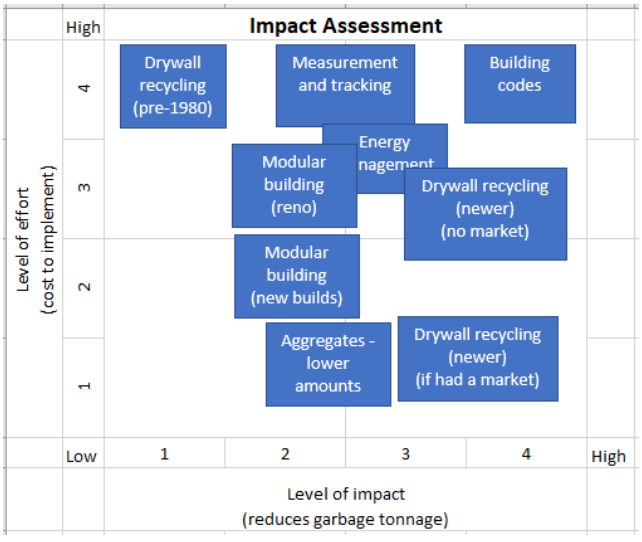
Building codes is an action with high impact and high effort, thus would be considered as a “major project” that yields high return but also very time-consuming. Working with government and professional associations to adjust building codes and standards that support recycled content and products/ inputs that are more readily disassembled are areas of focus within this action, as identified in Table 2-1.

Energy management and measurement and tracking also fall into the “major project” assessment category, with potential for relatively high returns but also requires time and effort. These actions need further investigation.

Modular building for new construction was an action with relatively low effort and moderate impact, with modular buildings for renovations resulting in the same level of impact but relatively higher effort. These are actions that are assessed as “Fill-ins”, actions that should be investigated as time-permits.

Drywall recycling for pre-1980 material is an action that, while has low impact and high cost and is considered a “thankless task”, falls under Work Safe BC regulations due to the hazardous material content and requires special handling. Material cannot be recycled but must be managed according to regulations.

Figure 2-2 Impact Assessment for Construction and Renovation Actions



3 Campus Housing

Campus housing engagement session was the second of the three sessions hosted as part of stakeholder engagement. Figure 3-1 shows the zero waste initiatives for the campus housing sector as well as the discussion topics for the engagement session.

Figure 3-1 Zero Waste Initiatives and Discussion Topics for the Campus Housing Sector

3.1 Campus Housing Sector Actions, Opportunities, Challenges and Solutions

The discussion in this this sector was around actions for organics management/ transfer, behaviour change to increase capture of divertible material, recycling additional items, sharing economy, and zero waste stations. Table 3-1 summarizes the discussion for this activity.

Table 3-1 - Housing Actions Table

Action Type	Opportunities	Challenges	Solutions
Organics management/ transfer	- customize note or tag to give out at regular checks, dovetail with fire inspection - compost bin look different! - Waste wise app uptake/ collection calendar - random incentives and rewards (gold star program, gift certificates), dovetail with draw for monthly fire inspections - messaging – take out compost within x number of days	- collecting but not transferring compost/ leaving in rooms - contamination issues - harder at McGill and East Village	
Behaviour change to increase capture	- peer influencers, build on successes! - find in-passing opportunities – RA and sustainability ambassadors' coordination - timing is key, start with orientation!	- limited time - not used to it, not comfortable	- education/ community based social marketing (CBSM)
Recycling additional items	- batteries, metal, wood, etc. - increase capture - consistent placement/ container grouping		
Sharing economy	- virtual 'buy nothing' student-based FB page or other?	- COVID factor	- tables - online share platforms - repair café or other special events
Zero waste stations	- add stations as needed - increase capture for all stations	- all buildings have different set-ups require site-specific design	- East Village add stackable stations, link to move-in/ move-out process - McGill/ North – split bag recycling with publicity

3.2 Campus Housing Impact Assessment

The impact assessment activity for the housing sector is shown in Figure 3-2 below. Organics management and transfer has high impact and requires a mid-level of effort. Opportunities for this action described in Table 3-1 focus on overcoming challenges of compost not being taken out to the transfer bins, contamination, and the site-specific challenges in the North Tower and McGill residences. Opportunities identified during engagement sessions were around developing messaging/ reminders that could dovetail with the monthly fire inspection

processes, making the compost bin look different than the garbage bin to reduce contamination, and investigating collection calendars or reminders, like the City of Kamloops' Waste Wise app notifications.

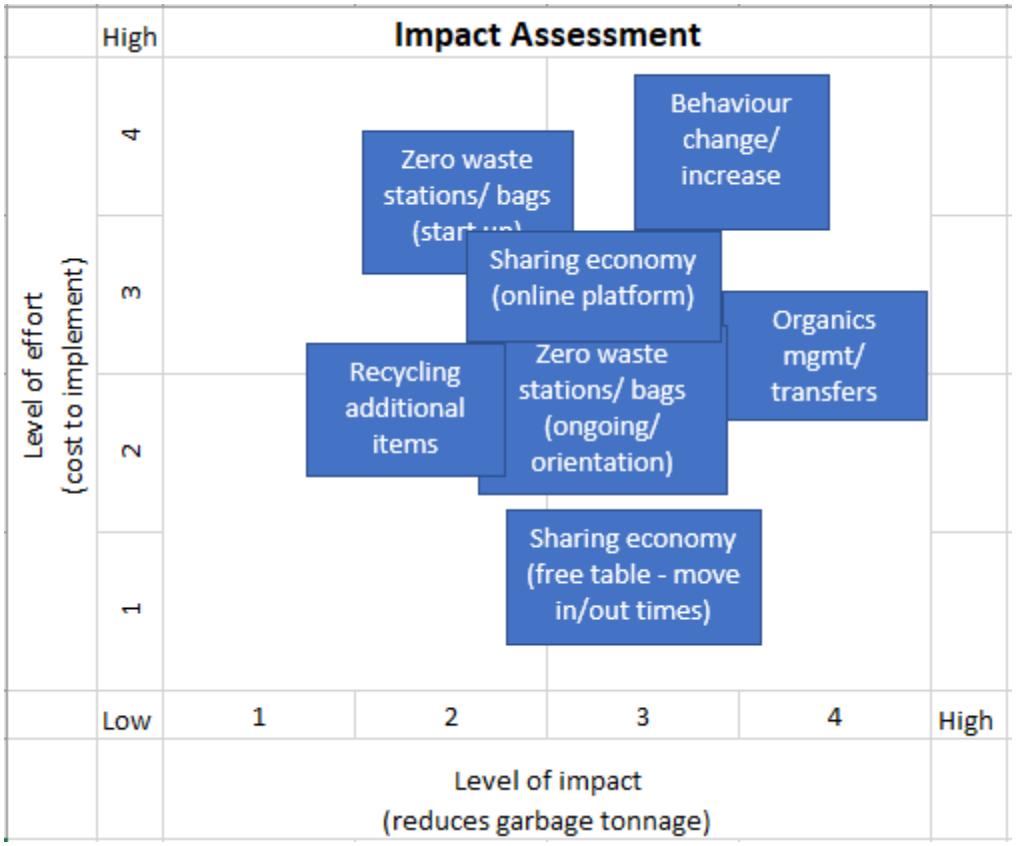
Sharing economy free tables during move-in/ out times was an action with low effort and relatively high impact. An online sharing platform requires a higher level of effort but would yield the same level of impact.

Zero waste stations/ bags have a higher start-up cost but once a system is established, the level of effort and cost reduces, and results in a relatively high impact. Each of the residences has a different set-up for stations therefore each requires a different approach. Stackable stations in East Village would be a consideration, whereas smaller rooms in McGill may benefit from split bag recycling.

Behaviour changes to increase capture is an action with high impact but also high level of effort. The challenges in this area are the limited time and turnover, with behaviours that students are not used to or comfortable with. The opportunities in this area are to build on successes and programs such as the RAs and sustainability ambassador program for peer-to-peer influence. Timing was identified as a key factor, with orientation being an ideal time for education and social change.

Adding new recycling streams to residences requires a medium level of effort with relatively lower level of impact. Building on successes of campus operations and systems already in place for batteries, metal, electronics, and wood to increase capture of recyclables is an opportunity in this area. Consideration should be given to ensure consistent placement and groupings of containers.

Figure 3-2 Impact Assessment for Housing Actions



4 Campus Operations

The campus operations engagement session was the third of the three sessions hosted as part of stakeholder engagement. Figure 3-1 shows the zero waste initiatives for the campus operations sector as well as the discussion topics for the engagement session.

Figure 4-1 Zero Waste Initiatives and Discussion Topics for the Campus Operations Sector

4.1 Campus Operations Sector Actions, Opportunities, Challenges and Solutions

The discussion in this this sector was around Makerspace (a new initiative taking shape on campus), food waste prevention, free tables, and the Zero Waste Subcommittee of the Environmental Sustainability Advisory Committee (ESAC). Table 4-1 summarizes the discussion for this activity. The discussion did not identify any solutions and therefore there is further opportunity for stakeholder groups to collaborate on these topics where it fits.

Table 4-1 Operations Actions Table

Action Type	Opportunities	Challenges	Solutions
Makerspace	- collaborate with EcoClub - sponsor workshops and skill sharing - partner with Kamloops Makerspace - partner with equity deserving groups to increases access	- who attends? - how many? - info used over time?	
Food waste prevention	- food security emphasis - continue prevention food waste audits - ongoing measurement (Leanpath) - support food rescue for surplus, address student needs	- food safe limitations - how to get the word out/ create action?	
Free tables	- set up in three high travel areas - use partnerships to help monitor/ staff	- how best to monitor to avoid nuisance - overcoming COVID factor in the short term	
ESAC (Senate and Board multi-sector)/ ZW subcommittee	- add decision making power? - add student representation	- limited power/ resource access	

The impact assessment activity for the operations sector is shown in Figure 4-2 below. Strengthening the ZW Subcommittee has the potential for high impact and requires a mid-level of effort. Opportunities for this action described in Table 4-1 focus on overcoming challenges of limited power and access to resources by strengthening the committee decision makers as well as broadening student representation.

Food waste prevention and reducing single-use items are actions with high impact but also require a high level of effort. The challenges in this area are potential limitations dues to safety, as well as communicating and getting buy-in that lead to actions. The opportunities in this area are emphasize food security, supporting food rescue for surplus food to address student needs, as well as continuous audits and measurement using tools such as Leanpath. There was no discussion around the challenges and opportunities for reducing single-use items, which presents an opportunity to further explore this initiative with key stakeholders and the plan oversight committee.

Sharing economy initiatives for free tables and online sharing are actions with a medium level of impact. Startup for both free tables and online sharing require medium level of effort, however effort for free tables increases over time, whereas with online sharing, the level of effort reduces as the program gets established. Challenges discussed were around how best to monitor free tables to avoid nuisance, as well as overcoming potential

concern with COVID in the short term. Opportunities for free tables were to set these up in high travel areas and develop partnerships to help monitor/ staff the areas.

Makerspace, a shared community space for making, building, sharing, and collaborating using various shared tools. Although this action is not part of the zero-waste plan, it was brought up during the discussion as a Makerspace has been initiated on campus within the TRU library system. While outside of the scope of this plan, it was identified as an action requiring a relatively high level of effort with quite a low impact in terms of reducing garbage on campus. Some of the challenges identified for this action were around identifying target users, and how the information would be used over time. The opportunities in this area were collaborating with the TRUSU EcoClub, sponsoring workshops for skill sharing, partnering with the well-established Kamloops Makerspace, and partnering with equity-deserving groups (groups that require financial assistance) to increase access to the forum.

Figure 4-2 Impact Assessment for Operations Actions