



Tipping Fee Cost Recovery Assessment & Resource System Efficiency Study

Regional District of Central Kootenay

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→ The Power of Commitment



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1. Introduction

The Regional District of Central Kootenay (RDCK) is undertaking a tipping fee cost recovery assessment and resource recovery system efficiency study (Study) to gain an understanding of the current costs, cost recovery structure and overall efficiency of the resource recovery system.

The RDCK's goal is to develop a resource recovery system that is financially sustainable, resilient, and supported by balanced funding mechanisms. The distribution of urban and rural residents, governed by three sub-regions, has resulted in a complex network of solid waste infrastructure to provide varying levels of waste management services for RDCK residents and the commercial sector. This Study analyses the current cost structure, allocates costs by material and operation type, and recommends potential opportunities to reduce costs and increase system efficiency.

1.1 Scope and Limitations

This report has been prepared by GHD for Regional District of Central Kootenay.

GHD has prepared this report on the basis of information provided by Regional District of Central Kootenay and others who provided information to GHD (including Government authorities), which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

2. Background and Current System Review

The RDCK updated their Resource Recovery Plan (RRP) in 2021 to guide waste management programs, services, policies and procedures to reflect the region's current needs and support a zero-waste philosophy. The RRP gained approval by the BC Minister of Environment and Climate Change Strategy in 2023. The RRP identified actions for the RDCK to pursue which included a tipping fee cost recovery assessment and a resource recovery system efficiency analysis to ensure the resource recovery system is financially sustainable and resilient and supports waste reduction and diversion. This Study supports this RRP action. As part of the Study, a detailed background and current system review was completed to understand the RDCK resource recovery system.

2.1 RDCK Sub-Region Administrative Model

Located in the southern interior of British Columbia (BC), the RDCK consists of eleven unincorporated electoral areas (Central Kootenay A – K) and nine member municipalities (Castlegar, Creston, Kaslo, Nakusp, Nelson, New Denver, Salmo, Silverton and Slocan). The RDCK covers an area of approximately 22,000 km². The RDCK operates under three separate sub-regional service areas to manage resource recovery (West sub-region, Central sub-region, and East sub-region). Each sub-region operates independently regarding their waste management facilities, recycling programs, and service methods (i.e., contracted vs in-house operations). Each sub-region also completes separate annual budgets and tax requisitions with governance provided by sub-regional Resource Recovery Committees.

2.2 Population

The 2021 Census reported a total RDCK population of 62,509 (Statistics Canada¹). Table 2.1 summarizes the 2021 population breakdown for each member municipality and electoral area within each of the three sub-regions. The overall population density for the RDCK is 2.8 people per square kilometre. A total of 28,006 private dwellings were occupied by permanent residents, which equates to an average household size of 2.2 people.

¹ Statistics Canada, 2021 Census of Population.

Table 2.1 2021 Population Statistics per Member Municipality and Electoral Area

West Sub-Region		Central Sub-Region		East Sub-Region	
Municipality / Electoral Area	Population	Municipality / Electoral Area	Population	Municipality / Electoral Area	Population
Central Kootenay H	5,045	City of Nelson	11,106	Central Kootenay A	2,241
Central Kootenay I	2,607	Village of Salmo	1,140	Central Kootenay B	4,802
Central Kootenay J	3,517	Village of Kaslo	1,049	Central Kootenay C	1,475
Central Kootenay K	1,784	Central Kootenay D	1,462	Town of Creston	5,583
City of Castlegar	8,338	Central Kootenay E	3,897	Creston First Nation	93
Village of New Denver	487	Central Kootenay F	4,116		
Village of Silverton	149	Central Kootenay G	1,650		
Village of Nakusp	1,589				
Village of Slocan	379				
West Sub-Region Total	23,895	Central Sub-Region Total	24,420	East Sub-Region Total	14,194
RDCK Total Population					62,509

The Central sub-region contains the largest population of 24,420 people and covers a total area of approximately 8,830 km², equating to a population density of 2.77 capita/km². The West sub-region has a population of 23,895 people and covers a total area of approximately 9,970 km², equating to a population density of 2.40 capita/km². The East sub-region has the smallest population of 14,194 people but covers the smallest total area (4,350 km²), equating to the highest population density of 3.26 capita/km². The RDCK is a unique regional district with over half (52%) of its population residing in electoral areas outside of municipal boundaries.

Population growth estimates were published by BC Stats and expect a population of 84,956 in the year 2046. This equates to an average growth rate of 1.1% annually (calculated with the 2021 census data). This growth rate is similar to the historic growth rate of 5% over the five-year period between the 2016 and 2021 census results.

2.3 Overview of Solid Waste Management & Facilities

The RDCK does not currently provide curbside collection services for garbage, recycling or organics. Member municipalities provide these programs to their residents to varying degrees:

- All nine member municipalities provide curbside collection of garbage, while only five provide curbside recycling collection (City of Castlegar, Village of Nakusp, City of Nelson, Village of Kaslo, and Town of Creston).
- Organic curbside collection is provided by the City of Castlegar and Town of Creston. City of Nelson is currently piloting a self-haul pre-treated organics program.
- Portions of Electoral Areas H, I, and J are the only electoral areas to have curbside recycling services provided by Recycle BC (RBC).

To increase program accessibility, the RDCK operates a network of 24 public-facing waste facilities to manage various waste and recyclable materials and contributes funding to one eco-depot (Nelson Leafs Recycling Centre). The network consists of a mixture of landfills, transfer stations, and recycling depots. All facilities are attended during opening hours, and inaccessible to the public outside of operating hours. The RDCK operates three landfills, two composting facilities, 13 transfer stations, and 22 recycling depots. The two composting facilities and 13 of the recycling depots are located at waste transfer stations or landfill sites. The RDCK partners with the Nelson Leafs Recycling Centre to provide the only full-service eco-depot in the regional district, located in the Central sub-region.

The RDCK identifies each of the 22 recycling depots as either a “core depot” or a “satellite depot” based on the Recycle BC funding approach. Each type provides a different level of service according to the designation. At all depots, the RDCK manages the costs for depot infrastructure, maintenance, staffing, and operations, while Recycle BC provides financial incentives based on the quantity and quality of residential recyclable materials received. Recycle BC also provides the collection bins for residential paper and containers at core depots and funds all post-collection costs, which includes the hauling, processing and marketing of recyclables from the 12 core depots. This allows core depots to accept all Recycle BC material categories (residential recyclables only). Satellite depots accept limited recyclable materials (paper, cardboard, plastic and metal containers and glass) as the RDCK pays for the post-collection hauling for consolidation at the nearest core depot or Recycle BC consolidation point. Although they are not directly funded by Recycle BC, satellite depots were integrated into the waste management network to maintain most of the historical level of local recycling services. As required by Recycle BC, all recycling depots are staffed to assist with proper sorting to reduce contamination of materials.

Transfer station sites accept similar waste materials throughout all sub-regions, including, but not limited to mixed waste (MSW), wood waste, scrap metal, tires and propane tanks. Smaller transfer stations (Boswell, Yahk, and Ymir) accept limited waste types due to collection and storage capacity.

The Organic Waste Diversion Strategy released in 2017 has driven organics initiatives throughout the RDCK focused on diverting organic materials from landfill. RDCK initiatives included the construction of two new composting facilities at the Creston Landfill and the Central (Salmo) Landfill. It also included upgrades to the Grohman Narrows transfer station and Ootischenia Landfill transfer area, allowing the sites to receive residential and commercial organic waste.

Table 2.2 summarizes the facilities operating in each sub-region. Table 2.2.3 summarizes the materials accepted at each facility².

Table 2.2 RDCK Solid Waste Facilities

Sub-Region		Facility Type
East		
1	Boswell Transfer Station	Satellite Recycling Depot & Transfer Station
2	Crawford Bay Transfer Station	Core Recycling Depot & Transfer Station
3	Creston Depot	Core Recycling Depot
4	Creston Landfill	Satellite Recycling Depot, Landfill & Compost Facility
5	Yahk Transfer Station	Satellite Recycling Depot & Transfer Station
6	Riondel	Satellite Recycling Depot
Central		
7	Balfour Transfer Station	Core Recycling Depot & Transfer Station
8	Kaslo Transfer Station	Core Recycling Depot & Transfer Station
9	Marblehead (Meadow Creek) Transfer Station	Satellite Recycling Depot & Transfer Station
10	Grohman Narrows (Nelson) Transfer Station	Satellite Recycling Depot & Transfer Station
11	Central (Salmo) Transfer Station	Transfer Station & Composting Facility
12	Ymir Transfer Station	Satellite Recycling Depot & Transfer Station
13	Salmo	Core Recycling Depot
14	Nelson - Lakeside	Core Recycling Depot
15	Kokanee Park Marina Satellite Depot	Satellite Recycling Depot

² Regional District of Central Kootenay. 2023. Waste & Resource Recovery. Accessed online from <https://www.rdck.ca/EN/main/services/waste-recycling.html>

Sub-Region		Facility Type
16	Nelson Leafs Recycling Centre	Eco-Depot (Private – Public Partnership)
West		
17	Burton Transfer Station	Satellite Recycling Depot & Transfer Station
18	Crescent Valley	Core Recycling Depot
19	Edgewood Transfer Station	Core Recycling Depot & Transfer Station
20	Nakusp Landfill	Core Recycling Depot & Landfill (landfill closing in 2025 and transfer station will be constructed)
21	Ootischenia (Castlegar) Landfill	Core Recycling Depot & Landfill
22	Rosebery Transfer Station	Transfer Station
23	Slocan Transfer Station	Core Recycling Depot & Transfer Station
24	Winlaw	Satellite Recycling Depot
25	New Denver	Core Recycling Depot

Table 2.3 Materials Accepted at RDCK Facilities

Facility	Household Garbage	Commercial Garbage	EPR (i.e. Used Oil and Antifreeze, Paints, etc.)	Recycle BC - Household glass, plastic, and paper products	Recycle BC - Household foam and flexible plastics	Commercial Cardboard & Recycling	Wood	Metal	Yard & Garden Waste	Organics	Tires	MARR Appliances	Propane Tanks	Vehicle Batteries	Mattresses	Construction, Demolition & Renovation (CDR)
East Sub-Region																
1 Boswell Transfer Station	X	X		X			X	X	X		X		X	X		X
2 Crawford Bay Transfer Station	X	X		X	X		X	X	X		X	X	X	X		X
3 Creston Depot				X	X	X										
4 Creston Landfill	X	X		X			X	X	X	X	X	X	X	X	X	X
5 Yahk Transfer Station	X			X												
6 Riondel Satellite Depot				X												
Central Sub-Region																
7 Balfour Transfer Station	X	X		X	X		X	X	X		X	X	X	X		X
8 Kaslo Transfer Station	X	X		X	X	X	X	X	X		X	X	X	X		X
9 Marblehead (Meadow Creek) Transfer Station	X	X		X			X	X	X		X	X	X	X		X
10 Grohman Narrows (Nelson) Transfer Station	X	X		X			X	X	X	X	X	X	X	X		X
11 Central (Salmo) Transfer Station	X	X					X	X	X	X	X	X	X	X		X
12 Ymir Transfer Station	X			X												
13 Salmo Core Depot				X	X	X										
14 Nelson – Lakeside Core Depot				X	X	X										
15 Kokanee Park Marina Satellite Depot				X												
* Nelson Leafs Recycling Centre			X											X		
Western Sub-Region																
16 Burton Transfer Station	X	X		X			X	X			X	X	X	X		X
17 Crescent Valley Core Depot				X	X	*paused										
18 Edgewood Transfer Station	X	X		X	X		X	X	X		X	X	X	X		X
19 Nakusp Landfill	X	X		X	X	X	X	X	X		X	X	X	X	X	X
20 Ootischenia (Castlegar) Landfill	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X
21 Rosebery Transfer Station	X	X					X	X	X		X	X	X	X		X
22 Slocan Transfer Station	X	X		X	X		X	X	X		X	X	X	X		X
23 Winlaw Satellite Depot				X												
24 New Denver Core Depot				X	X	X										

* Nelson Leafs Recycling Centre/Bottle Depot is operated by the Nelson Leafs. The RDCK provides financial support for the collection of non-EPR HHW at this site.

Curbside Collection

The rural curbside collection feasibility study completed in 2020 suggests that a regional curbside collection program was feasible for implementation in select electoral areas. The RDCK undertook public engagement to gain feedback on expanding collection services. In July 2023, the RDCK Board of Directors directed staff to prepare a service establishment bylaw for three-stream collection in portions of Electoral Area F and H, and two-stream collection services in portions of Electoral Area J. In November of 2023, after third readings, the RDCK board directed Staff to submit the Service Establishment Bylaws to the BC Provincial Inspector of Municipalities for approval. This service would expand curbside collection services to an additional 3,350 homes and 7,700 people. The program was required to pass a public referendum, which was not supported, and therefore will not be considered further.

2.4 Waste Flow Mapping

Waste flow was mapped to demonstrate the movement of garbage, recyclables and metal throughout the regional district. Tonnage data for the year 2022 was analysed to identify the initial disposal facility for each sub-region. The analysis included MSW on both a scale and volume basis, other landfilled wastes (asbestos, construction, demolition and renovation (CDR), land-clearing, noxious weeds, rubble, bulky waste and septage), Recycle BC materials, Industrial, Commercial and Institutional (ICI) recyclable materials, biosolids, organic waste, scrap metal, uncontaminated soil, wood waste, and yard and garden waste.

Figures mapping the material flow within each sub-region are provided in Appendix B. The Central sub-region does not have an active landfill, therefore waste materials collected in this sub-region are transferred to Ootischenia Landfill for disposal.

2.5 2023 Waste Composition Study

The RDCK undertook a waste composition study in August of 2023 to evaluate the MSW composition received at the Ootischenia Landfill and Creston Landfill. The waste composition study evaluated MSW originating from residential curbside collection, ICI sector, transfer station and residential drop-off bins, and CDR activities.

The primary waste categories observed in the overall garbage composition from all sectors were compostable organics (24%), followed by paper (14%), plastic (14%), non-compostable organics (11%) and building materials (11%). The overall analysis for all sectors combined determined that approximately 67% of MSW disposed could be diverted from landfill through an existing diversion program, managed either by the RDCK or Extended Producer Responsibility (EPR) organization.

The audit found that approximately 28% of the RDCK’s garbage was made up of paper and plastics combined, however, only 14% of the waste stream was considered recyclable (including glass and metal), due to gaps in Recycle BC’s EPR programming. This 14% also assumes that ICI materials are accepted, which is currently funded 100% by the RDCK as Recycle BC does not accept recyclable materials from this sector. Figure 2.1 highlights the RDCK overall garbage composition (materials ending up in landfill) and Figure 2.2 highlights the diversion potential of the landfilled waste stream.

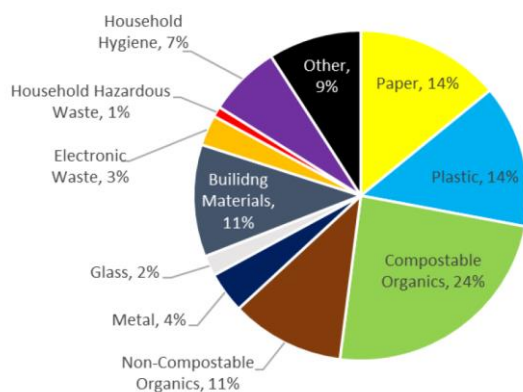


Figure 2.1 RDCK Overall Landfilled Waste Composition

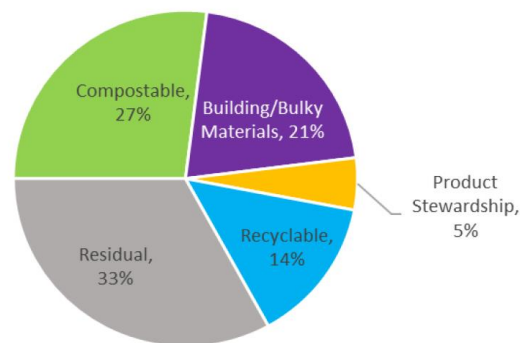


Figure 2.2 RDCK Diversion Potential of Landfilled Waste Stream

The highest diversion potential categories from each sector is summarized below:

- Single family residential: compostable materials represented 35% of the waste composition.
- ICI sector: compostable materials represented 39% of the waste composition.
- Transfer station self-haul: building/bulky materials represented 35% of the waste composition, followed by compostable materials at 12%.
- CDR sector: building/bulky materials represented 89% of the waste composition.

2.6 Waste Reduction and Diversion Initiatives

RDCK waste reduction and diversion programs, services and initiatives apply to all sub-regions and are summarized in Table 2.4.

2.6.1 Recycling

The RDCK's extensive network of 22 recycling depots provide varying levels of services for residential and ICI recycling of Packaging and Paper Products (PPP). This network provides primary PPP recycling services for 52% of the RDCK population living in rural areas and 4% of the urban population living in smaller municipalities without curbside recycling collection. The network provides secondary service for the remaining 44% of the RDCK population living in urban settings, who receive curbside recycling collection through their respective municipality.

Some EPR and product stewardship programs are available at RDCK transfer stations and landfills to provide residents with access to additional diversion programs. This includes materials such as tires, propane tanks, vehicle batteries and major appliances. The waste composition study indicated that product stewardship materials comprise 5% of overall disposed waste. This consisted of 3% electronic waste, 1% deposit beverage containers, and 1% household hazardous waste (HHW). To increase access to HHW disposal, the RDCK coordinates free annual HHW roundups in six locations across the region to collect non-EPR HHW. These events also collect non-PPP EPR materials (such as paint, motor oil, electronic equipment, lighting, small appliances, etc.) in areas with reduced access to EPR programs. The RDCK also supports the year-round collection of residential non-EPR HHW at the Nelson Leafs Centre. The RDCK plans to establish similar eco-depots in Creston, Castlegar and Nakusp in 2025.

2.6.2 Organics Diversion

The RDCK is in the process of implementing a robust organics waste diversion strategy which includes the commissioning of two new organics facilities and four organics drop-off locations. The 2023 waste composition study can be used as a baseline to track the performance of this system over time with the goal to lower the composition of compostable food waste and paper currently present in single family and ICI sector garbage. The RDCK plans to undertake another waste audit in 2028, in which composition can be compared and program performance evaluated.

The RDCK promotes backyard composting on their website to increase diversion where curbside collection or self haul of organics is not feasible.

2.6.3 Waste Reduction and Reuse

The Region may consider partnerships with local non-profits, organizations and municipalities to enhance and leverage education, awareness and services within the region. This may be done through securing additional recycling depot partnerships, much like the Nelson Leafs Recycling Center, and partnering with non-profit organizations such as Ocean Ambassadors Canada, who can provide programs such as zero waste coaching for small businesses (made available with regional funding support).

Regulatory approaches may include exploring amendments to the Resource Recovery Facilities Regulatory Bylaw to include landfill bans on recyclable materials or mandating three stream collection within the ICI sector. The RDCK currently incentivizes diversion from landfill by charging lower rates for materials such as wood and metal, compared

to garbage. Assessing tipping fees over time to ensure they align with diversion goals and best practices will continue to promote the user pay approach and may increase waste diversion, reduction and reuse.

2.6.4 Education and Awareness

The RDCK's public engagement platform is a system strength, that allows for community led solutions by enabling robust public feedback and input to improve current systems and future programs and services.

Table 2.4 RDCK Waste Reduction and Diversion Initiatives

	Initiative	Description	Performance & Recommendations
Recycling	Recycling Facilities for Packaging and Paper Products (PPP)	<ul style="list-style-type: none"> Of the 22 RDCK recycling depots, the 12 Core Depots collect all Recycle BC items. The 10 Satellite Depots collect only glass, paper and plastics. Commercial recycling (cardboard) is currently collected at seven facilities (one is currently on hold). 	<ul style="list-style-type: none"> The 2023 waste audit indicated 14.5% of single-family garbage was recyclable paper and plastic. Of this 14.5%, 9% are accepted for recycling at all 22 RDCK recycling facilities, while 5.5% (foam, plastic film and flexible packaging) are only accepted at the 12 core depots. Of the overall garbage landfilled, foam, plastic film and flexible packaging made up 3.8%. Enhanced public education and awareness should be implemented to increase diversion rates. Continued advocacy for fair and equitable access to Recycle BC programs to rural populations should be undertaken on a Regional and Provincial level. Ensure facilities have clear educational signage and prompts to direct users to appropriate bins and reduce contamination. Signage should direct users to other facilities where applicable to encourage recycling or reuse.
	Other Extended Producer Responsibility (EPR) and Product Stewardship Programs	<ul style="list-style-type: none"> The Nelson Leafs Recycling Centre (open year-round), collects EPR materials such as paint, used motor oil, electronics, batteries, lighting products, small appliances etc. Product Stewards collect automotive batteries, tires, propane tanks, and major appliances directly from 13 RDCK transfer stations and landfills. 	<ul style="list-style-type: none"> The 2023 waste audit indicated that 5% of garbage going to landfill was EPR materials. Continue the partnership service model as demonstrated with the Nelson Leafs Recycling Centre into the future and to additional locations throughout the region. Advocate for increased EPR presence at events to collect expanded list of materials for increased diversion. Enhanced promotion of disposal options for these materials may increase diversion. Conduct a cost analysis or pilot program to include new EPR materials such as mattresses, electric vehicle batteries and other compressed canisters³ (such as fire extinguishers as propane canisters are already accepted at 13 RDCK facilities).
	Household Hazardous Waste (HHW) Collection	<ul style="list-style-type: none"> Annual HHW collection events hosted in six communities around the region provide an opportunity to dispose of up to 35 different residential HHW materials for free. Some EPR materials, such as electronics, batteries, lighting, small appliances, etc. are also collected at these events. The RDCK partners with the Nelson Leafs Recycling Centre for increased access to non-EPR HHW recycling services. Commercial HHW is not accepted at the eco-depot or the events. 	<ul style="list-style-type: none"> The 2023 waste audit indicated that 1% of garbage going to landfill was HHW. In 2022, the RDCK collected 0.31 kg per capita of HHW at the events and 2.76 kg per capita at the eco-depot. Continue with annual HHW collection events which provide access to disposal programs to the regions under serviced areas. Advocate for increased EPR presence at events to collect expanded list of materials for increased diversion.
Organics Diversion	Compost Facilities	<ul style="list-style-type: none"> Two composting facilities have been constructed to accept organics from the residential, agricultural, and ICI sectors (Creston facility launched in 2022 and Central facility launched in 2023). Customers will be able to drop off organics at four waste facilities. 	<ul style="list-style-type: none"> In 2023, 27% of the overall garbage landfilled was compostable materials (organics and food soiled paper). A follow-up waste composition study is planned for 2028 to evaluate program performance. Monitor incoming organics tonnage and service costs at each location annually to observe disposal trends by source, type and location. Increase collection points to improve access where capacity is required and economically feasible. Continue to undertake periodic waste audits and composition studies to understand diversion trends, challenges and opportunities for increased organics and recyclables diversion. A large portion of organics in the garbage stream comes from ICI sources. Landfill bans or surcharges on ICI organics in the garbage stream is a common practice throughout Canada and may provide as an effective incentive to divert this material stream to composting.
	Backyard and Small-Scale Composting Promotion	<ul style="list-style-type: none"> The RDCK provides online educational resources via their website to the public to promote backyard composting to increase organics diversion. This supports organics diversion in areas where customer drop off is not feasible or desirable. The RDCK has supported small-scale composting in the Villages of Silverton and New Denver since 2021 by partially funding the development of a pilot program that uses Joracans. 	<ul style="list-style-type: none"> Educational workshops facilitated by the RDCK or local partners (in person and online) providing instruction on backyard composting. RDCK distribution of animal resistant backyard composters to households at subsidized cost. Jora composters are animal resistant self-contained units commonly used in communities with active bear populations. The RDCK could explore grant funding programs such as the Clean BC Organics Infrastructure and Collection Program to support subsidies.
	Free Yard and Garden Waste Events	<ul style="list-style-type: none"> Annually, in April and October, three East sub-region waste facilities accept yard and garden waste at no charge to the resident. Annually, in May and October, 11 of the West and Central sub-region waste facilities accept yard and garden waste at no charge to the resident. 	<ul style="list-style-type: none"> Consider discontinuation of the free yard and garden waste collection. Yard and garden waste has a cost to manage and is not at risk of being landfilled. The tipping fee for yard and garden waste could be increased to align with the cost of providing the service.
Waste Reduction & Reuse	Diversion Incentives	<ul style="list-style-type: none"> To encourage diversion, tipping fees were increased 10% on March 1, 2023, and an additional 10% on January 1, 2024 at all RDCK landfills and transfer stations. Each sub-region has its own Fee Schedule. The Resource Recovery Facilities Regulatory Bylaw doubles tipping fees for loads containing more than 10% recyclable materials. 	<ul style="list-style-type: none"> The RDCK had a 32% diversion rate in 2022. Continue to promote diversion through user pay approach. Review of tipping fees every five years to consider adjustments to mixed waste and recyclables.

³ https://www2.gov.bc.ca/assets/gov/environment/waste-management/recycling/recycle/extended_producer_five_year_action_plan.pdf

	Initiative	Description	Performance & Recommendations
		<ul style="list-style-type: none"> – Recycling depots have no tipping fees to encourage recycling. – The RDCK has 13 transfer stations and landfills in which materials such as scrap metal, wood, and soil (landfills only) are accepted for diversion or repurposing. These materials as well as food waste have lower tipping fees than mixed waste to encourage separation and diversion. 	<ul style="list-style-type: none"> – Explore updates to the Resource Recovery Facilities Regulatory Bylaw to systematically divert additional materials from Landfill, such as landfill bans on recyclable and compostable materials. Bans along with revised tipping fee schedules will generate additional revenue from incoming waste and fines.
	Trash to Treasure Events	<ul style="list-style-type: none"> – The RDCK and Regional District of Kootenay Boundary host Trash-to-Treasure days annually in April and October. – The one-day event allows residents to swap unwanted items on the roadside to promote reuse and circular behaviours. 	<ul style="list-style-type: none"> – Continue this initiative to promote reuse within the community. – Events can be supplemented with promotion of educational resources on other zero waste initiatives such as textile waste reduction.
	Resource Recovery Plan	<ul style="list-style-type: none"> – The RDCK Board has directed staff to incorporate zero waste as a long-term goal in the Resource Recovery Plan. – This philosophy is the foundation of the Resource Recovery Plan and guides future actions and policies. 	<ul style="list-style-type: none"> – The RDCK has fulfilled and/or is pursuing key commitments within the RRP such as consultation and study on regional curbside collection, waste audits, organic waste diversion and system efficiency and equitability studies. – Continue to prioritize and integrate zero waste initiatives throughout all RDCK operations and departments.
	Reuse Centres	<ul style="list-style-type: none"> – There are currently six reuse centres at RDCK waste facilities, with one additional centre pending implementation. – This allows for the exchange and reuse of household items in good working condition to promote reuse and landfill diversion. 	<ul style="list-style-type: none"> – Continue to expand and promote this service to additional waste facilities where economically feasible.
Education & Awareness	Resource Recovery Education Program	<ul style="list-style-type: none"> – The program employs year-round “waste spotters” at all scaled facilities. – Waste spotters screen loads of waste arriving at various disposal facilities for prohibited, controlled and recyclable items. – They also educate and inform customers on resource recovery policy and initiatives, waste diversion and zero waste practices and answer questions. 	<ul style="list-style-type: none"> – Continue this program throughout the RDCK. – Monitor common materials contaminating recyclables or being landfilled to support education and awareness initiatives or development of new recycling programs.
	Waste Diversion Education & Promotion	<ul style="list-style-type: none"> – Promotion of recycling and reuse via distribution of Recycle BC and RCBC resources online. 	<ul style="list-style-type: none"> – Continue promotion of these resources online via the RDCK website, at events and within distributed household materials. – Develop ICI specific recycling resources to provide businesses and institutions with guidance and contacts to increase recycling and composting. – Explore partnerships with non-profits to provide local businesses with zero waste coaching, education, training and operational support, such as the Ocean Ambassadors Canada Zero Waste Coaching for Small Businesses program.
	Wildsight Beyond Recycling program	<ul style="list-style-type: none"> – The RDCK supports the classroom based Beyond Recycling education program developed and delivered by Wildsight in the Columbia Basin. The program provides environmental education in local elementary schools, consisting of 25 lessons, projects, and field trips, as well as additional student and teacher resources and extension activities. – A minimum of five classrooms in the RDCK participate in the program every year. A key component of the program is the “waste field trip” in which students tour an RDCK landfill with RDCK staff highlighting solid waste management practices and key waste diversion messages. 	<ul style="list-style-type: none"> – Continue with this program as a key learning opportunity for youth within the region.
	Public Engagement	<ul style="list-style-type: none"> – The RDCK engagement website provides an opportunity to gain feedback and input on various waste diversion programs. – Currently, the RDCK has engaged the public on ICI organics, ICI used cooking oil, and organic waste diversion initiatives. 	<ul style="list-style-type: none"> – Continue to engage residents with this platform as an avenue to gain valuable feedback and input on challenges and barriers and new programs and services.

2.7 Waste Metrics

Metrics for various waste categories were prepared with facility scale data and volume data provided by the RDCK. The metrics outline waste generation and diversion rates throughout the respective sub-regions and overall RDCK on a tonnage and per capita basis.

It should be noted that the Central sub-region is the only sub-region without a landfill. Therefore, materials that are only accepted at landfills (e.g. soils, biosolids, asbestos, etc.) generated by residents and the ICI sector within the Central sub-region are transported to the Ootischenia Landfill in the West sub-region for disposal. As a result, some values within the tables below may be artificially low in the Central sub-region and higher in the West sub-region.

In addition, the recycling data reported only includes Recycle BC data collected from RDCK Recycling Depots. This does not include curbside recycling collection data from municipalities and rural areas that operate under Recycle BC contracts (Castlegar, Nakusp, Nelson, Kaslo, Creston, portions of Areas I and J) or privately hauled ICI recycling. As a result, the calculated diversion rates below are underestimated.

Table 2.5 Annual RDCK Tonnage Disposed and Diverted (2022)

Material	West Sub-Region	Central Sub-Region	East Sub-Region	RDCK (Total)
MSW (Scale)	10,332	7,087	5,733	23,152
MSW (Volume)	986	2,289	490	3,765
Other Waste Landfilled ¹	2,391	1,178	946	3,585
Recycling, Diversion and Re-use ²	6,592	2,379	4,219	13,190
Tires	11	18	15	44
Organics (Food, Yard & Garden) ³	314	1,604	1,009	2,927
Total Landfilled (tonnes)	13,709	9,625	7,168	30,502
Total Diverted or Repurposed (tonnes)	6,917	4,001	5,243	16,161
Total Generated (tonnes)	20,626	13,626	12,411	46,663
Diversion Rate (%)	34%	29%	42%	35%
Septage ⁴	5,395	1,217	0	6,612

1. Includes asbestos, construction, demolition and renovation (CDR) waste, land-clearing waste, noxious weeds, biosolids, rubble, and bulky waste.

2. Includes wood, Recycle BC materials, metal, soil, and HHW.

3. Includes mostly yard and garden materials, as the collection of food waste started in the East in mid-2022, and food waste collection had not yet started in the Central and West as of 2022.

4. Septage is reported separately as it is managed as a different waste stream.

Waste generation and diversion metrics were developed on a per capita basis for each material type using Statistics Canada 2021 Census of Population, shown in Table 2.6 below.

Table 2.6 Per Capita Metrics by Waste Type (2022)

Waste Type	West Sub-Region (kg/person)	Central Sub-Region (kg/person)	East Sub-Region (kg/person)	RDCK (kg/person)
Asbestos	7 ¹	0 ¹	3	3
Biosolids	1 ¹	0 ¹	<1	<1
Construction, Demolition and Renovation Waste (CDR)	91 ¹	10 ¹	64	53
Household Hazardous Waste (HHW)	<1	7	<1	3
MSW or Mixed Waste	475 ¹	384 ¹	439	431
Food Waste ²	0	0	10	2
Residential and Commercial Recycling	28 ³	46 ³	37 ³	37
Scrap Metal	16	10	4	11
Soils	200 ¹	<1 ¹	202	122
Tires	<1	<1	1	<1
Wood Waste	32	35	54	38
Yard and Garden Waste	13	66	61	45
Total Landfilled	574	394	505	488
Total Diverted	290	118	333	222
Total Generated	863	512	838	710
Septage ⁴	208	38	0	94

1. Values in the West sub-region are artificially high and values in the Central sub-region are artificially low as most soils, all biosolids and asbestos, as well as some CDR and mixed waste generated in the Central sub-region are collected in the West sub-region where they are landfilled or used in operations at the Ootischenia Landfill.

2. Food waste values are low as collection had not yet started in the Central and West as of 2022 and the collection of food waste started in the East in mid-2022.

3 This excludes recycling data from municipalities and rural areas with Recycle BC curbside collection programs, as well as any privately collected ICI recycling; therefore, these values will be underestimated.

4 Septage is reported separately as it is managed as a different waste stream and is neither landfilled nor diverted.

The largest category of material managed in the RDCK is mixed waste, followed by soil, septage, yard and garden, CDR and wood waste. It is anticipated that as organics diversion programs mature, food waste diversion will increase significantly, potentially above 100 kg/person, with a corresponding reduction in mixed waste.

Bulking agents, such as yard and garden waste and chipped clean wood, are required to facilitate the composting process of food waste. As a new composting system is implemented, the volume of bulking agents required is high. However, as the program matures, the bulking agents ('overs') are recycled through the process, and the volume of bulking agents required is expected to decline. Yard waste, in addition to the minimum needed as a bulking agent, requires processing and storage requirements, resulting in additional costs.

The large volume of septage in the West sub-region is indicative of the high number of rural houses using septic tanks, and the low hours of operation at the Central landfill which results in many septage haulers from the Central sub-region disposing at Ootischenia landfill.

It should be noted that the relatively low tonnage of recyclables presented is not necessarily reflective of a low recycling rate. Recyclable materials generally have a low bulk density (e.g. cardboard, containers, etc.) and significant volumes of material may be diverted from landfill.

The large volume of soil reported may be a result of the low tipping fee for this material. Soil is required for landfill operations, and typically for small landfills a 1:6 to 1:8 soil ratio is used. The current soil acceptance ratio of approximately 1:5 indicates that the volume of soil currently accepted is slightly higher than needed for landfill operations. It also indicates that the tipping fee could be increased. It should be noted that a portion of the soil received in 2020-2022 is from RDCK projects and was accepted to alleviate a past deficit. The amount of soil received by landfills is not as sensitive to the tipping fee, as it is related to the capital projects in the immediate vicinity, and the ease of access for contractors. It is likely that if the tipping fee for soil was increased to match that of mixed waste, and the quantity of soil accepted would be closer to 1:6 to 1:8.

3. Tipping Fee Cost Recovery Assessment

The RDCK is committed to establishing a user pay system, in which users who generate waste pay for its disposal, and tipping fees cover a significant portion of the cost to manage most materials. The RDCK resource recovery system is funded through both tipping fees collected at waste facilities and taxation based on assessed property value. This is done as existing tipping fees alone cannot cover the entirety of operating costs. Some materials, such as wood and metal, are subsidized through taxation such that tipping fees can be reduced to incentivize diversion. Tipping fee structures developed for each of the three sub-regions are based on waste material type, charging weight-based fees or volume-based fees as set out in the Resource Recovery Facilities Regulatory Bylaw No. 2905, 2023. Due to rising costs, tipping fees were increased 10% on March 1, 2023, and an additional 10% on January 1, 2024 at all RDCK landfills and transfer stations.

3.1 Tipping Fee Cost Recovery Model Development

A tipping fee cost recovery assessment model (the Model) was developed to analyse the cost recovery of the existing tipping fee structure. This was completed by determining the cost to manage each material and identifying any gaps between management costs and tipping fee revenue. This was evaluated for each sub-region, as costs to manage materials vary dependant on the facilities and infrastructure available in each sub-region. In addition, the annual budgets and tax requisitions are managed separate for each sub-region.

3.1.1 Inputs

To develop the model, the following data inputs were provided by RDCK:

- Operational and administrative expenses for fiscal years 2020, 2021 and 2022
- Tipping fee revenue for fiscal years 2020, 2021 and 2022
- Tonnages received for fiscal years 2020, 2021 and 2022
- Capital expenses from 2016 through 2022
- RDCK's capital plan for 2023 through 2027
- 10 Year Financial Plans for Resource Recovery

3.1.2 Methodology

Recognizing the complexity of RDCK's resource recovery system and the associated costs, a method for allocating and visualizing costs was determined in collaboration with the RDCK project team. The model incorporates the inputs in section 3.1.1 to provide enhanced insight into the cost of managing waste types across the RDCK.

As shown in Table 3.1, costs were assigned to three subcategories: Operations and Maintenance Costs, Capital Costs and Administrative Costs. This allocation method was chosen with input from the RDCK to articulate the various cost center expense data provided and to create a simple, yet informative visual for understanding associated material costs. The costs were represented as a cost per tonne.

It should be noted that costs related to the operations and maintenance of the HB Tailings Facility were provided by RDCK but excluded from the analysis.

3.1.2.1 Operations and Maintenance Costs

Operations and Maintenance (O&M) costs were derived from Resource Recovery expense data (Services S186-S188, A116-A120, and A102) provided by RDCK and organized into the following three categories:

Table 3.1 Operations and Maintenance Cost Category Definitions

Category	Definition
Direct Operations & Maintenance	Line-item costs that were allocated to individual materials ¹
Indirect Operations & Maintenance	Costs that were related to the operations and/or maintenance of the RDCK resource recovery, but not directly material related ²
Operations & Maintenance Related Salaries	Salaries, benefits and overtime costs incurred that were not considered administrative and were directly applicable to O&M related activities ³

¹ A vendor list derived from the expenses provided was reviewed by RDCK and where possible, costs were allocated to specific materials. This improves the model validity by assigning true costs to materials in lieu of a simple method of applying across all materials.

² Where direct material allocations were not possible, costs were allocated by three-year average tonnage percentages to produce a cost per tonne.

³ Through discussions with RDCK, an allocation matrix was developed to assign O&M-related salary costs to materials where possible. Salary expenses for six O&M employee classifications were allocated to specific materials based on the proportion of each material managed by the respective type of employee (% based on tonnage, only included materials that were greater than 0.5% of the waste stream).

3.1.2.2 Capital Costs

The RDCK provided two capital datasets, one representing capital expenditures from 2016 through 2022 and the capital plan from 2023 through 2027. In the original analysis, these costs were considered separate and reflected in the model as Past and Future Capital Costs. Upon discussion with RDCK, it was determined to consolidate capital into one cost as a reflection of what RDCK can anticipate the average annual capital burden to be over a forward-looking period of 10-years, including both past and future capital costs. Capital costs include expenses associated with all assets, infrastructure, and landfill development and closure costs.

RDCK Staff identified individual capital cost line items were determined to be paid for through either financing, reserves or grants, where applicable. Originally excluded from the capital considerations, capital expenses paid for by reserves were included to accurately capture the cost of RDCK capital projects. Line items that were financed used the Municipal Finance Authority of BC's Long Term Lending Rates to determine an expected borrowing cost, with 3.6% being used in the model.

Additionally, capital costs were allocated to a specific material type where possible or, where not possible, given an 'All' category where costs were allocated across all materials based on three-year average fraction of tonnage managed.

Each capital cost was then assigned two remaining categories to complete the analysis, lifespan and whether the cost was recurring. Lifespan was determined to be either a period of 10 or 25 years, and capital items to be recurring (i.e. vehicles or bins) were identified. For those items with recurring costs, costs were inflated at the end of their respective lifespan for the duration of analysis years in the model based on an estimated annual inflation rate of 2%.

3.1.2.3 Administrative Costs

Administrative costs were estimated based on expenses in the Resource Recovery Services (S186-S188, A116-A120, and A102) as well as expenses related to transfers to other Services (A100, IT, and General Admin) provided by the RDCK. These costs reflected both the administrative and technical salary expenses incurred by the RDCK associated with the facilitation of the resource recovery program, as well as the portion of salaries and expenses from IT and RDCK general administration allocated to Resource Recovery. It also includes expenses related to program communications, advertising, insurance, legal, licensing and permit fees, Director stipends, mileage and travel expenses, RDCK vehicles, staff education, training, and travel, etc.

Since administrative expenses are not directly tied to specific materials, for the purposes of the model administrative expenses were applied equally across all materials to determine a cost per tonne for each administrative category (salaries and benefits, other administration expenses). Based on this allocation, administrative costs are directly proportional to the tonnage of a material managed.

3.1.3 Assumptions and Limitations:

During the development of the model, data limitations were noted, and assumptions were made to deliver an efficient and reflective model for RDCK to understand associated costs.

Identified data limitations in the review phase were resolved through discussions with RDCK staff. Key assumptions used in development of the Model include:

- Tonnage: Based on three-year average of tonnage data from 2020-2022⁴.
 - Tires: The RDCK is provided with tire collection tonnage from Tire Stewardship BC.
 - Household Hazardous Waste (HHW): Some HHW data was converted from litres to tonnes using best estimates
 - Organic Waste: As the organics program (food waste) had not yet been fully implemented in the study period, annual organics tonnages (and associated revenues) were estimated based on monthly tonnages received in 2023 and in 2024 to date.
- Salaries: The model used 2022 salary data for RDCK, as using an average would underestimate the salary burden of the resource recovery program as salaries are expected to increase year over year. To reflect expenses as accurately as possible, the model also incorporated new salaries that did not exist in 2022 (i.e. projects advisor and three field supervisors).
- Revenue: Based on three-year average tipping fee revenues from 2020-2022.
 - Tipping fees increased by 10% in 2023 and an additional 10% in 2024, however full fiscal year financial data was not available for these years when the model was built. To analyze cost recovery for each material as accurately as possible, the model shows both the 2020-2022 revenue per tonne as well as the calculated revenue per tonne based on the 2024 tipping fees.
 - The model used a conversion factor to convert the revenue collected from volume-based tipping fees to tipping fee per tonne to develop an estimated revenue per tonne of material received.
- HB Tailings Facility expenses were removed as per discussions with RDCK.
- The scope of work was modified from the initial proposal due to the fact that differences in cost recovery between rural versus urban waste, container/volume versus scaled waste, compacted versus non-compacted waste, and chipped versus non-processed yard and garden and wood waste could not be determined with the data available.

⁴ Conversion factors were used to estimate tonnages of some materials, such as yard and garden and CDR as not all sites have scales.
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3.2 Model Results and Recommendations

The allocation of costs by material type are presented in the tables below. The Model outputs for the cost of managing 16 waste material types are broken down for each sub-region and the overall RDCK. The 16 waste material types and the estimated costs associated with managing each material are summarized. The cost to manage values in the tables below are estimates as several assumptions were made in the allocations of costs. However, these values can be considered accurate to +/- \$10/tonne for large throughput waste types (i.e. mixed waste, CDR, septage, wood, soil, yard and garden and recyclables).

These values were used to estimate the percent cost recovery from tipping fees. The cost recovery is slightly over estimated as the 2024 tipping fee revenue is compared to the costs from 2020-2022. Where tipping fee revenue covers less than 100% of the cost, the balance is currently covered through taxes. Some materials, such as recyclables and HHW, have no tipping fees and therefore are fully funded through taxation and/or other incentives, such as Recycle BC. Typically, in regional solid waste operations, revenue from mixed waste tipping fees is set higher than cost to manage to partially subsidize diversion costs for materials with lower or no tipping fees.

The model results are presented as follows:

- Table 3.3 – East Sub-Region Costs and Revenues per tonne per material
- Table 3.4 - Central Sub-Region Costs and Revenues per tonne per material
- Table 3.5 – West Sub-Region Costs and Revenues per tonne per material
- Table 3.6 - RDCK Overall Cost and Revenues Per Tonne Per Material

3.2.1 East Sub-Region Costs and Revenues

The cost to manage mixed waste, organic waste, rubble, scrap metal, wood, yard and garden, and soils is significantly higher than the revenue received, indicating that tipping fees are not recovering the cost of managing these materials in the East sub-region.

The cost of organics management is very high as compared to the revenue received. As engagement in the program increases (resulting in increased tonnage) the program is anticipated to increase the amount of tonnes processed which will decrease the cost per tonne to manage, but overall the program will be at a low scale due to the small population served by the facility and full cost recovery via tipping fees is not likely possible at this scale of operation.

The cost of managing mixed waste is higher than the tipping fee charged. This is due to the small population in the East sub-region resulting in lower economies of scale. The revenue from mixed waste in the East sub-region is approximately \$950,000 per year versus an estimated cost of \$1,220,000 to manage mixed waste.

Overall, the East sub-region recovers approximately 53% of system costs through tipping fees and the rest through taxation. On a per capita basis taxation is approximately \$77 per person.

Table 3.3 East Sub-Region Costs and Revenues per Tonne of Material

Waste Type	Cost to Manage (\$/tonne)	Tipping Fee Revenue (\$/tonne)	2024 Tipping Fee (\$/tonne)	Tipping Fee Cost Recovery (%)	% of Waste Managed (2020-2022 average)
Asbestos	\$183	\$505	\$302.50	276%	0.4%
Biosolids	\$-	\$-	\$60.50	-	-
Bulky Waste	\$183	\$246	\$151.25	135%	<0.1%
Construction, Demolition & Renovation Waste	\$183	\$222	\$242.00	122%	4.9%
Land Clearing	\$183	\$243	\$242.00	133%	0.2%

Waste Type	Cost to Manage (\$/tonne)	Tipping Fee Revenue (\$/tonne)	2024 Tipping Fee (\$/tonne)	Tipping Fee Cost Recovery (%)	% of Waste Managed (2020-2022 average)
Mixed Waste	\$183	\$144	\$151.25	79%	61.7%
Organic Waste	\$613	\$84	\$96.75	14%	0.4%
Rubble	\$183	\$31	\$53.25	17%	2.4%
Scrap Metal	\$196	\$97	\$48.50	49%	0.6%
Septage	\$-	\$-	\$-	-	-
Wood	\$191	\$73	\$78.75	38%	5.9%
Yard & Garden	\$135	\$23	\$60.50	17%	9.4%
Soils	\$95	\$22	\$21.75 (uncontaminated)/ \$48.50 (waste soil)	23%	9.0%
Tires	\$106	\$301	varies	284%	0.1%
Recycling	\$571	\$-	\$-	-	5.0%
Household Hazardous Waste	\$6,411	\$-	\$-	-	0.1%
Total	\$2,323,045	\$1,224,725	-	53%	-

3.2.2 Central Sub-Region Costs and Revenues

The costs to manage materials in the Central sub-region are generally higher as there is no active landfill in this sub-region, so all materials for disposal must be hauled to the Ootischenia Landfill in the West sub-region.

The tipping fees do not cover the cost to manage materials of a significant quantity (over 1%). The cost to manage mixed waste, organic waste, wood, yard and garden, soils, scrap metal and septage remains significantly higher than the revenue received indicating that tipping fees are low for these materials in the Central sub-region.

Overall, the Central sub-region recovers approximately 48% of system costs through tipping fees and the rest through taxation. On a per capita basis taxation is approximately \$96 per person.

Table 3.4 Central Sub-Region Costs and Revenues per Tonne of Material

Waste Type	Cost to Manage (\$/tonne)	Tipping Fee Revenue (\$/tonne)	2024 Tipping Fee (\$/tonne)	Cost Recovery (%)	% of Waste Managed (2020-2022 average)
Asbestos	\$-	\$-	\$-	-	-
Biosolids	\$-	\$-	\$-	-	-
Bulky Waste	\$-	\$-	\$-	-	-
Construction, Demolition & Renovation Waste	\$233	\$260	\$242	112%	0.8%
Land Clearing	\$-	\$-	\$242	-	-
Mixed Waste	\$233	\$180	\$151	78%	59%

Waste Type	Cost to Manage (\$/tonne)	Tipping Fee Revenue (\$/tonne)	2024 Tipping Fee (\$/tonne)	Cost Recovery (%)	% of Waste Managed (2020-2022 average)
Organic Waste	\$202	\$127	\$96.75 / \$142.00 ²	63%	7.8%
Rubble	\$233	\$57	\$ 53.25	25%	0.4%
Scrap Metal	\$174	\$78	\$48.50	45%	1.6%
Septage	\$106	\$57	\$70	54%	7%
Wood	\$239	\$78	\$78.75	33%	5.9%
Yard & Garden	\$166	\$28	\$60.50	17%	9.5%
Soils	\$101	\$22	\$21.75	22%	<0.1%
Tires	\$136	\$353	varies	260%	0.2%
Recycling	\$1,039	\$-	\$-	0%	6.6%
Household Hazardous Waste	\$1,195	\$-	\$-	0%	1%
Total	\$4,465,275	\$2,124,284	-	48%	-

¹This value is reflective of the Central and West Sub-Region organics service (not just Central).

² out of region rate

3.2.3 West Sub-Region Costs and Revenues

The West sub-region has the highest throughput facility and consequently the lowest overall costs per tonne for mixed waste and other landfilled materials. The revenue received for mixed waste is higher than the cost for managing it which could allow for subsidization of the regional system. However, it doesn't currently as tipping fee revenue cannot be transferred between sub regions.

The cost to manage wood, soils and septage, as well as biosolids, rubble, scrap metal, and yard and garden materials remains significantly higher than the revenue received indicating that tipping fees are low for these materials in the West sub-region.

The cost to manage soil is higher than the tipping fee received, and on average more soil was received than is necessary to meet landfill airspace utilization targets. A higher tipping fee that at least matches the cost to manage the material may result in less soil being received. A lower tipping fee could be considered for larger projects if additional soil is needed.

Overall the West sub-region recovers approximately 86% of system costs through tipping fees and the rest through taxation. On a per capita basis taxation is approximately \$23 per person. The West sub-region seems to be benefiting from hosting the regional landfill for the West and Central sub-regions through reduced hauling costs and through the collection of a large amount of the commercial tipping fees from both sub-regions.

Table 3.5 West Sub-Region Costs and Revenues per Tonne of Material

Waste Type	Cost to Manage(\$/tonne)	Tipping Fee Revenue (\$/tonne)	2024 Tipping Fee(\$/tonne)	Cost Recovery (%)	% of Waste Managed (2020-2022 average)
Asbestos	\$146	\$336	\$302.50	231%	1%
Biosolids	\$78	\$60	\$60.50	77%	1%
Bulky Waste	\$146	\$266	\$266.25	183%	0%
Construction, Demolition & Renovation Waste (CDR)	\$146	\$237	\$242.00	163%	7%
Land Clearing	\$146	\$244	\$242.00	168%	0%
Mixed Waste	\$146	\$170	\$151.25	116%	42%
Organic Waste	\$38	\$-	\$96.75	-	0%
Rubble	\$146	\$54	\$53.25	37%	1%
Scrap Metal	\$92	\$69	\$48.50	75%	1%
Septage	\$78	\$58	\$70.00	74%	20%
Wood	\$149	\$70	\$78.75	47%	3%
Yard & Garden	\$168	\$30	\$60.50	18%	1%
Soils	\$78	\$48	\$21.75 (uncontaminated)/ \$48.50 (waste soil)	61%	21%
Tires	\$118	\$367	varies	311%	0%
Recycling	\$701	\$-	\$ -	-	2%
Household Hazardous Waste	\$5,284	\$-	\$ -	-	0%
Total	\$3,772,110	\$3,234,943	-	86%	-

¹This value is included in the Central sub-region organics service.

3.2.4 Overall RDCK Costs and Revenue

The Table 3.6 below presents a regional perspective if tipping fee revenue was shared between the sub-regions. Based on the inputs and allocations in the model, overall, the cost of mixed waste management is slightly below the revenue received which indicates that mixed waste tipping fees are not covering the cost of managing mixed waste in addition to not subsidizing diversion of other materials.

It should be noted that incentives or rebates are received for scrap metal and recycling. Revenues from this incentive when added to the tipping fee revenue for scrap metal fully recovers the RDCK’s cost to manage this material. Recycle BC incentives do not cover the cost of recycling operations, therefore recycling is heavily subsidized through taxation. Recycle BC is currently in the process of reviewing its incentive structure.

Overall, the RDCK recovers approximately 52% of system costs through tipping fees and the rest through taxation. On a per capita basis taxation is approximately \$81 per capita although taxes are not calculated based on the RDCK as a whole but by sub-region.

Table 3.6 Overall RDCK Costs and Revenues per Tonne of Material

Waste Type	Cost to Manage (\$/tonne)	Tipping Fee Revenue (\$/tonne)	2024 Tipping Fee (\$/tonne)	Cost Recovery (%)	% of Waste Managed (2020-2022 average)
Asbestos	\$193	\$364	\$302.50	189%	0.4%
Biosolids	\$88	\$61	\$60.50	69%	0.4%
Bulky Waste	\$193	\$261	\$266.25	135%	0.0%
Construction, Demolition & Renovation Waste	\$193	\$235	\$242.00	122%	4.6%
Land Clearing	\$193	\$246	\$242.00	127%	0.1%
Mixed Waste	\$193	\$167	\$151.25	87%	51.5%
Organic Waste	\$284	\$118	\$96.75	42%	1.0%
Rubble	\$193	\$43	\$53.25	23%	1.0%
Scrap Metal	\$144	\$75	\$48.50	52%	1.3%
Septage	\$101	\$58	\$70.00	57%	12.3%
Wood	\$199	\$74	\$78.75	37%	4.6%
Yard & Garden	\$163	\$26	\$60.50	16%	5.3%
Soils	\$88	\$44	\$21.75 (uncontaminated)/ \$48.50 (waste soil)	50%	12.7%
Tires	\$125	\$345	varies	275%	0.1%
Recycling	\$933	\$-	\$ -	-	4.2%
Household Hazardous Waste	\$1,664	\$-	\$ -	-	0.3%
Total	\$10,573,784	-	\$6,583,952	62%	-

3.2.5 Tipping Fee Recommendations

Of the high throughput materials (those greater than 3% of the waste stream), the costs to manage mixed waste, septage, wood, yard and garden and soils are significantly higher than the tipping fee revenues and therefore changes to the tipping fee rates and category definitions should be considered for these materials. Potential changes are as follows:

Septage: It should be noted that the tipping fees for septage have been increasing biennially and are scheduled to increase to \$90/tonne in 2025, which brings the tipping fees close to cost recovery. As required by the Ministry as part of the approval of the 2021 RRP, the RDCK plans to transition away from managing this material at landfills. Staff are currently in the consultation phase with stakeholders and municipalities and planning for alternate future management of septage.

Mixed waste: Plan mixed waste tipping fee increases such that the tipping fee revenue meets the cost of managing mixed waste in all sub-regions. The average cost to manage mixed waste across the sub-regions is \$193/tonne and the tipping fees could be raised to this amount to cover costs and encourage diversion.

Wood: Wood is accepted at a lower tipping fee to incentivize diversion, but the majority is not diverted from landfill. Wood is currently chipped, with some being mixed with septage and used as landfill cover, and the remainder being stockpiled at sites across the RDCK with no foreseeable end use. Beneficial uses of wood waste, such as in compost or biochar, are prevented by allowing painted and other wood types that may be considered contamination by some end users. The current Bylaw distinguishes between Clean Wood and Wood Waste in the definitions; however these materials currently have the same tipping fee and management practices. Clean wood is wood without paint or glues that can be beneficially reused. Waste wood includes laminate, painted wood and other wood materials such as furniture. These 'dirty' wood-based materials should be charged the mixed waste tipping fee and landfilled directly, thus saving on storage and chipping costs. Increasing the tipping fee for clean wood to approximately 75% that of mixed waste would aid in recovering the costs to manage the material while still incentivizing diversion.

Yard and Garden: Yard and garden waste is costly to manage and approximately one third appears to be accepted during bi-annual free collection events. Due to the low tipping fee and free events, the management of yard and garden waste is substantially paid for through taxation. Tipping fee increases or elimination of the free events would increase the tipping fee cost recovery for managing this material, reducing tax subsidization. Although it is likely that less yard and garden waste would be received if the free events did not take place, managing yard and garden waste costs more than the posted tipping fee and therefore managing the material for free increases costs further. Alternatively, as the free yard and garden events are well-utilized and there is a benefit in fire prevention, a user pay system may not be the most suitable option for this material.

The cost in lost revenue from providing the free yard and garden events for the Central sub-region is approximately \$22,000 per year, equivalent to approximately 1% of the annual tipping fee revenue received, \$30,000 per year in the East sub-region and \$5,000 in the West sub-region. The cost in lost revenue for the RDCK as a whole as a result of the bi-annual free yard waste events is approximately \$57,000 per year.

Soil: The current tipping fee for soil is \$21.75 for uncontaminated soil and \$48.50 for waste soil

- **Waste soil:** There are few alternatives for disposing of waste soil and therefore the tipping fee for waste soil should match either CDR or at minimum, mixed waste. The landfill environmental containment infrastructure is necessary to manage the potential impacts from contaminated soil similar to CDR or mixed waste, and the full cost of designing, constructing, operating and closing the facility should be recovered.
- **Uncontaminated soil:** Uncontaminated soil is needed for landfilling but not in the quantity received from 2020-2022. Landfilling large quantities of uncontaminated soil consumes airspace and reduces landfill life. As regulations regarding the relocation of uncontaminated soil have increased, there are few options for uncontaminated soil disposal and a low tipping fee is not necessary to incentivize uncontaminated soil disposal at the landfills. The tipping fee for uncontaminated soil could be increased to 75% of the mixed waste rate and it is likely that the Creston and Ootischenia landfill sites would continue to receive sufficient uncontaminated soil for operations. If additional uncontaminated soil was needed for operations, a lower rate could be provided to larger projects, who could also be required to provide equipment to stockpile the soil on site, thus lowering the management cost for the RDCK.

The following recommendations are made for the lower throughput materials (less than 3% of the waste stream):

Organics: The cost of managing organics is currently much higher than the tipping fee revenue. This is partially due to low tonnages as a result of being in the early stages of program implementation. It is anticipated that the cost to manage organics will decrease as tonnage increases; however not likely to the point of cost recovery based on current tipping fees. The RDCK would like to use taxation to subsidize tipping fees for this material to incentivize diversion of food waste. However, a tipping fee increase is not recommended at this stage of the program. Tipping fees could be reviewed two to three years after program implementation once the program is established and tonnage inputs are normalized, to bring the tipping fee revenue closer to the cost to manage.

Rubble: A significant quantity of rubble is not received across the region, with the exception of the East sub-region. Historically, tipping fees for rubble was lower as the material was stockpiled and used on site for beneficial reuse. Currently, rubble is collected and disposed of as mixed waste (i.e. landfilled) and therefore the separate category for rubble could be eliminated or combined with CDR (to account for the additional challenges associated with landfilling larger materials), or categorized as mixed waste.

If rubble was included in the CDR category at current tipping fee rates, the RDCK as a whole could increase tipping fee revenue by approximately \$109,000 per year. If rubble was included in the mixed waste category at current tipping fee rates, the region could increase tipping fee revenue by approximately \$59,000 per year.

Including rubble in the CDR category at current tipping fee rates would allow the East sub-region to increase their tipping fee revenue by approximately \$54,000 per year, the Central sub-region by approximately \$13,000 and the West sub-region by approximately \$42,000. If rubble was included in the mixed waste category at current tipping fee rates, East sub-region to increase their tipping fee revenue by approximately \$31,000 per year, the Central sub-region by approximately \$6,500 and the West sub-region by approximately \$22,000.

Tipping Fee Revenue Allocation: Currently tipping fee revenue remains in the sub-region that collects the fee as they are governed under different bylaws and have separate budgets in the RDCK's Financial Plan. Many operations in the West and Central sub-region systems are integrated as they share landfill and compost facilities, but the cost recovery through tipping fees is significantly different between the two sub-regions. An example includes how tipping fees from commercial waste stay in the West sub-region even if the waste originates in the Central sub-region. This results in a per capita tax rate of \$22 in the West sub-region vs. \$96 per capita in the Central sub-region. The aggregating of costs and revenues across the sub-regions into one RDCK cost to manage the solid waste system would result in a more equitable and efficient system for all residents. Tipping fee increases and other recommended cost saving actions could be implemented to increase the overall tipping fee cost recovery and lower the average per capita tax rate for all.

3.3 Pro-Forma Annual Budget

Using cost allocations produced by the Model, a pro-forma annual budget was developed and presented in Table 3.7 below.

Table 3.7 Pro-Forma Annual Budget

Cost Category	2023 System Costs (with average capital costs from 2024 - 2033)	Proportion of Total Budget (%)	Notes
Operations	\$5,798,000	58%	-
Recycling Depots and Transfer Station	\$3,262,500	32%	Variable – hours of operation and hauling efficiency (fuel and driver/tonne)
Landfill	\$1,470,600	15%	Variable – hours of operation and hauling efficiency (fuel and driver/tonne)
Hauling	\$818,900	8%	-
Compost	\$247,100	2%	Low as facility is not at full capacity
Capital Costs	\$2,831,800	28%	-
Past Capital Costs	\$536,400	5%	-
Future Capital Costs	\$2,295,000	23%	-
Future Legacy Landfill	\$664,000	7%	West, Central, East Legacy Landfill and Closure Works
Future Operating Landfill	\$967,800	10%	-
Future Transfer Station	\$1,034,200	10%	-
Future Compost	\$165,400	2%	-
Administration / Management	\$1,427,000	14%	-
Total	\$10,055,800	100%	-

Based on the 2020 to 2022 fiscal data input in the model, the RDCK Resource Recovery system had an average annual budget of \$10,055,800. The items with the highest potential to reduce costs are the recycling depot/transfer station operations at 32% of the total budget, and future capital costs at 23%

Tipping fee revenue from this timeframe covered approximately 53% of the annual budget, with the remaining 47% paid for through taxation, grants, and other forms of revenue such as Recycle BC and scrap metal incentives. As tipping fees have increased since this timeframe (by 10% in 2023 and a subsequent 10% in 2024), the current cost recovery is estimated to be up to 62% in 2024, with 38% recovered through taxes.

4. System Efficiency Study

A service level benchmarking assessment was conducted to identify the following:

- If the RDCK is over or underserved internally, comparing the three sub-regions, as well as externally (compared to other similar regional districts).
- Potential opportunities to recognize financial and administrative efficiencies.
- Limitations on realizing or implementing efficiencies.

4.1 Service Level Benchmarking Assessment

4.1.1 Research and Data Collection

A jurisdictional scan was completed to identify BC regional districts with similar characteristics and demographics to the RDCK for use in the benchmarking assessment. The jurisdictional scan was conducted as per the following steps:

1. **Selection Criteria:** The following criteria were chosen to identify regional districts comparable to the RDCK: population, land area (km²), and population density (capita per km²).
2. **Long-List Development:** All regional districts in BC were included in the long-list and further researched to determine the population, area (km²), and population density (population/km²).
3. **Long-List Evaluation and Short-List Development:** The 27 regional districts in the long-list were compared against the selection criteria values for the RDCK. A short list of seven regional districts was developed based on similarity to the RDCK:
 - Cariboo Regional District (CRD)
 - Columbia Shuswap Regional District (CSRD)
 - Regional District of East Kootenay (RDEK)
 - Regional District of Fraser Fort George (RDFFG)
 - Regional District of Kootenay Boundary (RDKB)
 - Regional District of Okanagan-Similkameen (RDOS)
 - Thompson Nicola Regional District (TNRD)

GHD provided the RDCK with a long list of potential criteria for benchmarking service levels. Based on discussions between GHD and RDCK Staff, criteria for the service level benchmarking assessment were narrowed down to the following:

- Types of materials accepted at each facility,
- Proportion of population residing in urban (municipality) and rural (electoral area) areas (%),
- Proportion of population with curbside collection or self-haul as reported by the regional district or member municipalities (%),
- Number of facilities (total and by facility type, i.e. landfill, recycling depot, transfer station),
- Facility density (per km² and per 10,000 residents), facility hours of operation (total and per 10,000 residents),
- Number of administrative sub-regions,
- Number of core and satellite recycling depots System costs per tonne waste generated and per capita (where available).

The above information, where available, was gathered and tabulated for each sub-region within the RDCK, for the RDCK as a whole, and for each of the short-listed regional districts as summarized in the next section.

4.1.2 Benchmarking

The service level criteria were evaluated for the RDCK, each of its sub-regions, and each of the seven short-listed regional districts. Upon beginning the data collection and compilation, the following changes were made to the above criteria based on data availability, complexity, and suitability:

1. **Facility type:** Standardization of facility type was a challenge due to significant variation in the operations of facilities across the regional districts (e.g. regional vs. RBC recycling depots, engineered vs. non-engineered landfills, transfer stations with recycling depots, standalone transfer stations or recycling depots, etc). Upon discussion between RDCK and GHD, it was decided that facilities would instead be categorized by estimated service population. However, since geographic waste sheds around each of the

161 facilities in the assessment are not defined, and data on populations for these waste sheds is not available, it was difficult to estimate service populations. It was subsequently decided to categorize facility type based on whether they were attended or unattended, as described in Table 4.1 below.

- Types of material accepted at each facility: Table 2.3 in this report documents materials accepted at the various sites across the RDCK. However, based on the large number of different materials handled, the high number of facilities included in the assessment (161), and the high frequency in which the types of materials accepted change, this criterion was not included in the benchmarking.

Table 4.1 Facility Type Classifications

Facility Type	General Characteristics
Unattended	<ul style="list-style-type: none"> – Typically, small transfer stations and/or regional-run recycling stations that only accept limited materials. Unstaffed sites cannot collect recyclable materials under contract with Recycle BC⁵. – Service small populations (up to 2000, but majority service populations under 500). – Accessible 24 hours, seven days a week. – Unable to collect tipping fees. – Costs associated with maintenance, repair, and clean up tend to be high due to higher risk of contamination, illegal dumping, vandalism and other health and safety hazards.
Attended	<ul style="list-style-type: none"> – Facility type varies from small transfer stations and/or standalone recycling depots all the way to full-service landfills with transfer stations and recycling depots on-site. – Service level and associated staffing costs vary significantly but tend to increase with size of facility/population served. – More materials accepted than at unattended sites.

Table 4.2 below outlines population and geography benchmarking, comparing each region’s population, area, population density, proportion of population in urban and rural settings, proportion of residents with access to curbside collection versus self-haul, and the number of administrative sub-regions. Table 4.3 benchmarks the sub-regions by facility and by operating hours.

A detailed summary of all waste facilities within each regional district showing the facility name, facility type, size classification (estimated population served), and number of hours of operation per week in summer (where available) is provided in Appendix A.

⁵ RecycleBC Collectors Qualifications Standards require that an RBC recycling depot must be staffed when open to residents and securely fenced and locked when closed to residents (<https://recyclebc.ca/wp-content/uploads/2023/01/2023-Recycle-BC-Collector-Qualification-Standards.pdf>)

Table 4.2 Regional Characteristic Benchmarking

Regional District	Population (2021)	Area (km ²)	Population Density (per km ²)	Urban Capita (%)	Rural Capita (%)	Curbside Collection (MSW & Recycling)	Self-haul	Administrative Sub-Regions
Regional District of Central Kootenay	62,509	23,150	2.83	48%	52%	44%	56%	3
West Sub-Region	23,895	9,969	2.40	46%	54%	43%	57%	1
Central Sub-Region	24,420	8,830	2.77	54%	46%	55%	45%	1
East Sub-Region	14,194	4,351	3.26	39%	61%	33%	67%	1
Cariboo Regional District	62,931	80,373	0.78	40%	60%	45%	55%	1
Columbia Shuswap Regional District	57,021	28,885	1.97	60%	40%	60%	40%	1
Regional District of East Kootenay	65,896	27,514	2.39	73%	27%	59%	41%	3
Regional District of Fraser Fort George	96,979	50,580	1.92	84%	16%	79%	21%	1
Regional District of Kootenay Boundary	33,152	8,080	4.10	67%	33%	54%	46%	1
Regional District of Okanagan-Similkameen	90,178	10,406	8.67	75%	25%	100%	0%	1
Thompson Nicola Regional District	143,680	44,347	3.24	88%	12%	70%	30%	1
Thompson Nicola Regional District (without Kamloops)	45,778	44,049	1.04	63%	37%	5%	95%	1

Table 4.3 Facility and Operating Hours Benchmarking

Regional District	Facility Analysis							Operating Hours Analysis		
	Total Number of Facilities ¹	Attended Facilities	Unattended Facilities	Facility Density (per 10,000km ²)	Rank	Facility Density (per 10,000 residents)	Rank	Total Attended Facility Operating Hours per week	Attended Facility Operating Hours per 10,000 residents	Rank
RDCK	24	24	0	10.4	2	3.8	2	519	83	2
RDCK (West Only)	9	9	0	9.0	-	3.8	-	182	76	-
RDCK (Central Only)	9	9	0	10.2	-	3.7	-	227	93	-
RDCK (East Only)	6	6	0	13.8	-	4.2	-	110	77	-
Cariboo Regional District	30	13	17	3.7	8	4.8	1	677	107	1*
Columbia Shuswap Regional District	19	19	0	6.6	4	3.3	4	353	62	4
Regional District of East Kootenay	23	8	15	8.4	3	3.5	3	63	10	7*
Regional District of Fraser Fort George	21	17	4	4.2	7	2.2	6	647	67	3*
Regional District of Kootenay Boundary	10	6	4	12.4	1	3.0	5	186	56	6*
Regional District of Okanagan-Similkameen	5	4	1	4.8	6	0.6	8	134	15	8*
Thompson Nicola Regional District	29	29	0	6.5	5	2.0	7	845	59	5
Average	20	15	5	7.1		2.9		428	57	

¹ Public solid waste facilities include transfer stations, core or satellite recycling depots, and eco-depots (some facilities may provide more than one of these services)

*This regional district also has unattended facilities. Hours for unattended facilities were not included in this analysis.

Benchmarking Between Regional Districts (External)

The regional characteristic benchmarking highlights which regional districts are most similar in operation to the RDCK. Overall, the RDEK is the most comparable to the RDCK, having similar regional district population, area, population density, and number of administrative sub-regions. The RDEK has a greater urban population of 73% compared to the RDCK's 48% and as such, has a higher proportion of residents with curbside collection services. The CRD is most similar to the RDCK in terms of overall population and proportion of rural to urban residents, with over 50% percent of residents residing in a rural setting. The CRD and RDCK both have 44-45% of the population receiving curbside collection of garbage and recycling, and 55-56% required to self-haul these materials.

The facility benchmarking indicates that the RDCK operates higher than the average number of facilities operated by the regional districts in the study (24 compared to the average of 20). When the total number of facilities in each regional district is normalized by its area and population (facility density per 10,000 km² and per 10,000 residents), the RDCK ranks second and was above average in both categories.

The hours of operation benchmarking indicates that the RDCK's total operating hours at attended facilities (all RDCK facilities) is above the average number of total operating hours and when normalized by population, ranks second amongst the regional districts in the assessment. It should be noted that the analysis did not include operating hours for unattended facilities (24 hours, seven days a week) as these were not considered comparable in level of service to attended facilities. These observations indicate that the RDCK provides a high level of service, both in terms of facility locations and operation hours, compared to similar regional districts.

Benchmarking Between Sub-Regions (Internal)

The facility benchmarking in Table 4.3 indicates that the density of facilities based on population and area in all three of the RDCK's sub-regions is higher than the average for the regional districts in the assessment, with the East sub-region being the highest served in both metrics. The operating hours per 10,000 residents in all three sub-regions is higher than the average from the benchmarking group and second only to the CRD. The Central sub-region is the highest at 93-hours per 10,000 residents which is significantly higher than the average of 57-hours per 10,000 residents. The West and East sub-regions have similar hours of operation of 76 to 77-hours per 10,000 residents.

To highlight individual facilities where the RDCK may be under or over-operating internally, further benchmarking analysis was completed at the facility level. Table 4.4 ranks the value of the facilities within each sub-region based on the tonnage of waste (both garbage and recycling) received at these sites for each hour of operation.

Table 4.4 RDCK Facility Benchmarking

Facility	Type	No. Weekly Operating Hours in Summer (#)	Annual Tonnage Collected (2022)	Weight Collected per Hour of Operation (kg)	Rank
East Sub-Region					
Boswell Transfer Station	Transfer Station/Satellite Depot	8	119	286	3
Crawford Bay Transfer Station	Transfer Station/Core Depot	18	356	380	2
Creston Depot	Core Depot	40	397	191	4
Creston Landfill	Landfill/Satellite Depot	35	11,422	6,276	1
Yahk Transfer Station	Transfer Station/Satellite Depot	4	17	81	5
Riondel Recycling Depot	Satellite Depot	5	12	46	6
Central Sub-Region					
Balfour Transfer Station	Transfer Station/Core Depot	28	1,016	698	3
Kaslo Transfer Station	Transfer Station/Core Depot	18	395	422	4
Marblehead (Meadow Creek) Transfer Station	Transfer Station/Satellite Depot	8	111	266	5
Grohman Narrows (Nelson) Transfer Station	Transfer Station/Satellite Depot	54	10,684	3,805	1
Central (Salmo) Transfer Station	Transfer Station	12	1,488	2,384	2
Ymir Transfer Station	Transfer Station/Satellite Depot	6	74*	237	6
Salmo Recycling Depot	Core Depot	24	86	69	8
Nelson - Lakeside	Core Depot	54	544	194	7
Kokanee Park Marina Satellite Depot	Satellite Depot	23	47	40	9
West Sub-Region					
Burton Transfer Station	Transfer Station/Satellite Depot	4	52	249	5
Crescent Valley Recycling Depot	Core Depot	35	141	78	7
Edgewood Transfer Station	Transfer Station/Core Depot	8	71	170	6
Nakusp Landfill	Landfill/Core Depot	21	2,237	2,048	2
Ootischenia (Castlegar) Landfill	Landfill/Core Depot	54	21,599	7,692	1
Rosebery Transfer Station	Transfer Station	12	160	256	4
Slocan Transfer Station	Transfer Station/Core Depot	18	800	855	3
Winlaw Recycling Depot	Satellite Depot	12	14	22	9
New Denver Recycling Depot	Core Depot	18	72	77	8

* Annual waste tonnage data from Ymir is from October 2023 to October 2024 as 2022 tonnage data was not available.

As expected, the landfills receive the highest weight of waste per hour of operation, while the standalone recycling depots receive the lowest. One exception to this is Grohman Narrows Transfer Station, which receives more waste than the Nakusp Landfill. There were three facilities that received less than 50 kg of waste per hour of operation: Riondel Recycling Depot, Kokanee Park Marina Recycling Depot, and Winlaw Recycling Depot. These three facilities represent potential opportunities to reduce costs as each is in close proximity to other RDCK recycling facilities. Riondel Recycling Depot is approximately 13 km from the Crawford Bay Transfer Station and Core Recycling Depot. Kokanee Park Marina Recycling Depot is approximately 11 km from the Balfour Transfer Station and Core Recycling Depot and approximately 28 km from the Grohman Transfer Station and Core Recycling Depot. The Winlaw Recycling Depot is approximately 19 km from the Slocan Transfer Station and Core Recycling Depot. Even at low weekly hours

of operation, the costs of maintaining and operating these three facilities is over \$100,000 per year which is significant considering that only 73 tonnes of materials were collected from these three facilities in 2022.

The Salmo Recycling Depot, Crescent Valley Recycling Depot, New Denver Recycling Depot, and Yahk Recycling and Transfer Station accept between 50 and 100 kg per hours of operation. The Yahk facility is also open only four hours per week and there are no nearby RDCK facilities. The Salmo, Crescent Valley and New Denver facilities hours of operation could be reduced to less than 12 hours or less per week to bring the level of service more in line with other RDCK facilities.

Core and Satellite Recycling Depot Benchmarking

A Core Depot is a recycling facility in which Recycle BC funds all post collection costs including hauling, processing and marketing of the recyclables. A Satellite Depot is a facility in which a regional district funds the costs associated with hauling materials to the next Core Depot or another consolidation point before Recycle BC collection. Typically, a Satellite Depot accepts fewer materials than a Core Depot due to transportation costs and space restrictions. As per Recycle BC Statement of Work requirements, depots where materials collected will be processed under Recycle BC cannot be unattended and must be securely fenced and/or locked when closed to customers⁶. Recycle BC uses a service standard based on distance and minimum population to identify the number of Core Depots Recycle BC will fund in each regional district. Regional districts may choose to operate satellite depots at their own discretion. The RDCK supplements their 12 Core Depots with 10 Satellite Depots to maximize recycling accessibility to their rural residents.

Regional Recycle BC depot information was gathered for the regional districts within the scan from Recycle BC's 2023 Annual Report⁷, which lists all Recycle BC Core Depots. Table 4.5 summarizes the number and proportion of types of recycling depots in the regional districts that were part of this assessment, as well as for the RDCK's three sub-regions.

Table 4.5 Core and Satellite Depot Benchmarking

Regional District	Total Recycle BC Depots	Core Depots ⁸ (#)	Satellite Depots (#)	Core Depots (%)	Satellite Depots (%)
Regional District of Central Kootenay	22	12	10	55%	45%
West Sub-Region	8	6	2	75%	25%
Central Sub-Region	8	4	4	50%	50%
East Sub-Region	6	2	4	33%	67%
Cariboo Regional District	16	15	1	94%	6%
Columbia Shuswap Regional District	18	17	1	94%	6%
Regional District of East Kootenay	7	7	0	100%	0%
Regional District of Fraser Fort George	3	2	0 ⁹	100%	0%
Regional District of Kootenay Boundary	6	6	0	100%	0%
Regional District of Okanagan-Similkameen	9	9	0	100%	0%

⁶ <https://recyclebc.ca/wp-content/uploads/2020/11/Recycle-BC-Depot-SOW-SAMPLE-2023.08.01.pdf>

⁷ Accessed online from https://recyclebc.ca/wp-content/uploads/2024/06/Recycle-BC_Annual-Report_2023_F.pdf

⁸ Accessed from https://recyclebc.ca/wp-content/uploads/2024/06/Recycle-BC_Annual-Report_2023_F.pdf. Some Core Depots listed may not be operated by the Regional District, but are included as they contribute to the regions recycling accessibility.

⁹ Number of future satellite depots are currently in the process of being determined by RDIFFG

Regional District	Total Recycle BC Depots	Core Depots ⁸ (#)	Satellite Depots (#)	Core Depots (%)	Satellite Depots (%)
Thompson Nicola Regional District	27	14	13	52%	48%

The RDCK operates a high number of Satellite Depots compared to other regional districts. Apart from the TNRD, all other jurisdictions in the scan do not supplement their Core Depots with formal Satellite Depots. Some, such as the RDEK, operate regionally run recycling programs at their own expense to supplement the Recycle BC program in place. Satellite depots can also be informal and not reported publicly. For example, many First Nation communities in the CRD, RDFFG and TNRD collect recycling curbside in mobile eco-depots (cube vans) which operate as satellite depots by consolidating recycling at regional district facilities.

The RDCK and TNRD are similar in that during the transition from a regional district run recycling system to a Recycle BC funded system not all of the historical locations met the service standard to become Core Recycle BC funded Depots. Both regional districts are choosing to continue providing a higher level of service than the service standard that Recycle BC uses. The RDCK could reduce three satellite depots and continue providing a high level of access and service.

Further analysis was completed to evaluate the distribution of Core Depots across regional districts. The number of Core Depots in each regional district was normalized by the number of residents who rely on these depots for recycling services (i.e. those who do not have access to curbside recycling programs), and by the total area of the regional district. Table 4.6 outlines the results of this analysis.

Table 4.6 Core Depot Distribution Analysis

Regional District	Population (2021)	Area (km ²)	Core Depot Analysis						
			Population w/o curbside recycling (%)	Population w/o curbside recycling (2021)	Core Depots (#)	# Core Depots per 10,000 residents ¹	RANK	# Core Depots per 10,000km ²	RANK
RDCK	62,509	23,150	55%	34,380	12	3.5	5	5.2	4
RDCK (West Only)	23,895	9,969	57%	13,620	6	4.4	-	6.0	-
RDCK (Central Only)	24,420	8,830	45%	10,989	4	3.6	-	4.5	-
RDCK (East Only)	14,194	4,351	67%	9,510	2	2.1	-	4.6	-
Cariboo Regional District	62,931	80,373	55%	34,612	15	4.3	4	1.9	7
Columbia Shuswap Regional District	57,021	28,885	40%	22,808	17	7.5	2	5.9	3
Regional District of East Kootenay	65,896	27,514	41%	27,017	7	2.6	7	2.5	6
Regional District of Fraser Fort George	96,979	50,580	21%	20,366	2	1.0	8	0.4	8
Regional District of Kootenay Boundary	33,152	8,080	34%	11,272	6	5.3	3	7.4	2
Regional District of Okanagan-Similkameen	90,178	10,406	0%	0	9	-	1 ²	8.6	1
Thompson Nicola Regional District	143,680	44,347	30%	43,104	14	3.2	6	3.2	5
Average	61,350	26,953	40%	20,698	9	3.8		4.6	

¹ Residents without access to curbside recycling programs.

² RDOS is ranked first as they have nine core depots while 100% of their residents have access to curbside recycling services.

Increased access to curbside recycling programs results in lower hours of operations needed for Core Depots; however Core Depots are still required to receive materials that are not collected in curbside programs (e.g. glass, flexible plastics, foams).

Several regional districts with higher proportions of populations with curbside collection services still have a high concentration of Core Depots. The highest-ranking regional district (RDOS) had the lowest number of residents without curbside collection and one of the lowest total land areas. The RDCK ranks in the middle for both metrics. It has slightly below the average number of Core Depots per 10,000 residents without access to curbside service, and slightly more than average for Core Depots by total area. This data may be skewed based on the fact that the dataset only includes eight regional districts and not the entire Recycle BC service area but this dataset indicates that areas without curbside collection programs (i.e. rural areas) may be underserved by Recycle BC.

Total System Costs

Total system costs were identified for each benchmarked regional district, reported in public financial planning and solid waste related documents as annual waste management expenditures. The total system costs were calculated on a per capita basis and are shown in Table 4.7 below.

Total system costs per capita are estimates have the following limitations:

- Annual capital costs are not distributed evenly. The RDCK, RDKB, RDOS, and TNRD have varying degrees of capital investment costs reported, creating variability among the Regional Districts, and potentially skewing the results.
- Not all expenditures were available as historical actuals, therefore, in some cases budgets have been reported as total system cost.
- The make up of reported waste tonnage from regional jurisdictions is unclear, and either under-represents or over-represents the total tonnage used in the analysis.

Overall, the RDCK's total system cost per capita is slightly higher than the regional district average of \$168 per capita. The RDCK ranks as the third highest total system cost per capita among the regional districts in the scan, after the TNRD with the City of Kamloops excluded, and the RDKB. Considering the data limitations as described above, generally, the analysis indicates that the RDCK's cost per capita is aligned with the regional districts included in the scan, at \$10 per capita higher than the average, potentially supporting that the RDCK is providing a high level of service.

The total system costs for each regional district were compared to a simplified estimate of tipping fee revenue using tonnes landfilled multiplied by the mixed waste tipping fee. The total system costs and tipping fee revenue are estimates for comparison purposes, considering the limitations to the total system costs as described above. In addition, the corresponding year for data used in the annual mixed waste tonnage and tipping fee may not align, as tipping fees current as of 2024 were used in the estimates.

Overall, the RDCK has the highest tipping fees of all regional districts in the scan. With the RDEK removed, as they do not charge tipping fees for residential mixed waste, the average for mixed waste tipping fees is \$97/tonne as compared to the \$151/tonne in the RDCK.

On average, an estimated 40% the regional districts total system costs are funded by tipping fees (excluding the RDEK), compared to 45% by the RDCK. Based on the cost model and current tipping fee analysis, the RDCK is currently recovering up to 62% of cost through tipping fees. Both 45% and 62% cost recovery through tipping fees rank the RDCK higher than most regional districts in the scan on cost recovery through tipping fees. This potentially indicates that solid waste systems are increasingly being funded through taxation and less by tipping fees. This trend is consistent with regional districts over the last 15-years, as more materials are diverted from high tipping fee waste categories such as mixed waste, to lower tipping fee categories such as organics or recycling to incentive diversion. The overall cost of solid waste systems are increasing while the tonnage assigned a tipping fee decreases. To fund solid waste systems which are incentivising diversion, a model funded more through taxation than tipping fees becomes necessary.

Table 4.7 Total System Cost Comparison with Simplified Tipping Fee Revenue

Regional District	Estimated Tonnage Landfilled (2021) ¹	Mixed Waste Tipping Fee/Tonne ⁶	Simplified Tipping Fee Estimate for Comparison Purposes (2021 Tonnage X Mixed Waste Tipping Fee)	Total System Cost (Expenditures) (2022)	Estimated Total System Cost per Capita	% of Total System Costs Funded by Simplified Tipping Fee Estimate
Regional District of Central Kootenay	29,920	\$151	\$4,525,400	\$ 10,488,840 ⁴	\$178	45%
Cariboo Regional District	42,737	\$80	\$3,418,960	\$ 8,035,775 ²	\$128	43%
Columbia Shuswap Regional District	36,900	\$90	\$3,321,000	\$ 7,588,255	\$133	44%
Regional District of East Kootenay	48,648	\$0	\$0	\$ 9,164,169 ³	\$139	0%
Regional District of Fraser Fort George	82,740	\$98	\$8,108,520	\$12,164,001	\$125	67%
Regional District of Kootenay Boundary	21,772	\$120	\$2,612,640	\$ 7,617,530 ⁴	\$230	34%
Regional District of Okanagan-Similkameen	51,808	\$110	\$5,698,880	\$15,735,840 ⁴	\$174	36%
Thompson Nicola Regional District (City of Kamloops + TRND Systems)	94,757	\$90	\$8,528,130	\$23,015,298 ⁵	\$160	37%
Thompson Nicola Regional District Only System (excluding City of Kamloops Facilities)	24,308	\$90	\$2,187,720	\$11,534,492 ^{3,4}	\$252	19%

- 2021 tonnage calculated based on the disposal rate reported on the BC Sustainability Website – Municipal Solid Waste Disposal in B.C from <https://www.env.gov.bc.ca/soe/indicators/sustainability/municipal-solid-waste.html>. This includes waste from the residential and ICI sector, light industrial sources and CDR materials.
- Total system cost budgeted for year 2024.
- Total system cost for reported year of 2021.
- Includes one-time capital investment cost (cost varies per regional district).
- Based on TNRD SWMP Forecasts: A.-TNRD-Regional-Solid-Waste-Management-Plan-Final-draft-No-Appendices-reduced-size.pdf
- Tipping fees are current as of 2024.

4.1.3 Summary of Benchmarking Assessment Findings

Overall, the RDCK is providing a high level of service compared to other regional districts based on the hours of operation and the number of facilities per capita. To maximize system efficiency, the RDCK should consider closing facilities which collect less than 50 kg of recycling per hour of operation and are located less than a 20-minute drive from other RDCK facilities as residents are already using the neighbouring facilities for disposal of waste and core recyclable materials. There are other facilities that collect less than 100 kg of recycling per hour which are not near

other RDCK facilities where the hours of operation could be reduced while access is maintained. The recommendations by sub-region are as follows:

- East sub-region
 - Close Riondel Satellite Depot
- Central sub-region
 - Close Kokanee Park Marina Satellite Depot
 - Reduce the hours of operation at the Salmo Recycling Depot
- West sub-region
 - Close the Winlaw Satellite Depot
 - Reduce the hours of operation at the Crescent Valley and New Denver Recycling Depots

4.2 Current System Assessment

A current system assessment has been completed identifying current strengths, challenges and barriers, using the background review data and the service level benchmarking assessment.

4.2.1 Strengths

Organics Infrastructure: Recent organics infrastructure and organics initiatives are in place to divert residential and commercial organics from landfill. This includes the construction of two compost facilities (Creston and Central), which accept organics from residential, agricultural, and ICI sectors in the Region. In addition, public collection points have been set up at four waste facilities. The organics diversion initiatives should increase accessibility to programs and divert a portion of the 27% of the waste stream made up of compostable materials currently going to landfill.

Service Levels: The RDCK provides a consistent level of service throughout the region, with each category (type/size) of facility accepting similar materials regardless of location. On an hour of operation basis, the RDCK provides a high level of service compared to the other regional districts in the scan and could consider reducing hours of operation at Core Depots and closing some Satellite Depots. Based on the benchmarking, the number of Core Depots per capita is similar to other regional districts.

4.2.2 Challenges

Administrative Model: The RDCK operates under three administrative sub-regions that function similar to three separate regional jurisdictions. The administrative model creates challenges regarding the implementation of cohesive programming, funding mechanisms, and system efficiency. Of the short-listed regional districts, only the RDEK also operates under sub-region type of administrative model. Other jurisdictions have identified separate waste shed areas but still operate under one administration. The resource recovery system is reliant on each sub-region working cohesively as material consolidation and waste disposal require transferring across sub-regions.

Waste management infrastructure and operations in the RDCK has become more integrated, especially in the West and Central sub-regions, as the facilities have evolved and yet administrative and financially the sub-regions operate separately. Recycle BC will not provide funding to sub-regions but provides funding to the RDCK overall. Therefore, the operations are becoming more regional and integrated, but staff must spend time disintegrating operations and allocating costs to allow each sub-region to report separately.

Geography: The RDCK has a high population of residents living in rural areas (52%). The main population centres of Castlegar and Nelson are separated from Creston by the Kootenay Pass which at 1,774 m is the highest elevation highway pass in BC making regional consolidation of waste and recycling challenging.

Number of Facilities: The RDCK ranks as one of the highest in facilities per operating area compared to the benchmarked regional districts. The RDCK currently requires a high number of facilities to provide residents throughout urban, rural and remote areas with relatively equitable access to waste disposal and diversion programs. The operation of more facilities leads to higher operational costs.

Staffing Requirements: All RDCK facilities are staffed, which increases facility costs. Recycling facilities cannot be unattended as per Recycle BC contract requirements. In addition, staffing solid waste facilities is best practice as unattended sites often have issues with contamination, theft and vandalism, resulting in higher costs. The RDCK's facility operating hours are above average in all service population categories compared to the jurisdictions in the benchmarking exercise.

5. System Efficiency Recommendations

To increase system efficiency, the following recommendations are proposed:

1. The RDCK may consider implementing one tipping fee schedule across all sub-regions to simplify the operations and administration. The RDCK can consider the following changes to the tipping fees to increase cost recovery, noting that these would be some of the highest tipping fees in BC:
 - Asbestos, Biosolids, Bulky Waste, CRD, Land clearing, Noxious Weeds, Organic Waste, Scrap Metal, Tires – No change.
 - Mixed Waste – Increase to approximately \$193 per tonne to match the cost of management.
 - Rubble – Eliminate the rubble category and include in CDR at \$242/tonne.
 - Septage – Implement planned change to \$90/tonne.
 - Wood – Manage clean wood and waste wood as two different materials to reduce the amount of wood being stockpiled and processed and improve the potential for beneficial reuse (e.g. exclude painted wood, furniture, laminate, etc.). Increase the tipping fee for clean wood to 75% of the mixed waste fee, at approximately \$145/tonne. Wood waste should be charged the mixed waste tipping fee and landfilled.
 - Yard and Garden Waste – Consider the cost savings of discontinuation of the free yard and garden waste events vs. the popularity of the events and benefits to fire prevention. Increase the tipping fee to 75% of the mixed waste fee, at approximately \$145/tonne.
 - Soils – Increase the tipping fee for uncontaminated soils to 75% of the tipping fee for mixed waste (\$145/tonne) and increase the tipping fee for waste soils to the CDR tipping fee at \$242/tonne.
3. To save costs and still provide a level of service that is consistent with other regional districts, the RDCK could consider reducing hours of operation at some facilities that receive less than 100 kg per hour of recyclables. Table 4.4 in the benchmarking assessment was used to determine a list of potential facilities where it would be beneficial to re-evaluate the current hours of operation:
 - Salmo Recycling Depot
 - Crescent Valley Recycling Depot
 - New Denver Recycling Depot
4. To save costs and still provide a level of service that is consistent with other regional districts, the RDCK could consider closing three Satellite Depots that receive less than 50 kg per hour of recyclables and are within a 30-minute drive of other RDCK facilities. These include:
 - Riondel Recycling Depot
 - Kokanee Park Marina Recycling Depot
 - Winlaw Recycling Depot
5. The Grohman Transfer Station is one of two metal collection points that require metal to be moved off-site. As shown in the waste mapping figures in Appendix B, Grohman Transfer Station accepted approximately 25% of all scrap metal throughout the region and relocates this material to the Central (Salmo) Transfer Station. This additional material handling may account for the high operation costs at the Grohman. It is recommended that the RDCK review the site layout and operations to minimize double handling.

6. The RDCK has recently upgraded their scale software program. With a complex network of facilities, it is recommended that the scale software continue to be used to track the flow of materials to better understand tonnes collected and transferred at each facility. Accurate tonnages will allow the RDCK to evaluate the impacts of future program changes (reduced facility hours, organics diversion initiatives).
7. The hauling of waste is a significant cost to the RDCK but the costs of hauling waste with tipping fees are not tracked by material type (e.g. wood, mixed waste, etc.), and therefore allocating hauling costs by material is challenging. Tracking hauling trips and costs by material type would improve the ability for the RDCK to assess costs by material type and set tipping fees appropriately. Hauling of recyclables is tracked separately, however there is no tipping fee applied for this material.
8. New materials will be managed by EPR programs by 2026. These include electric vehicle (EV) batteries, mattresses, compressed canisters, and medical sharps. The RDCK already collects propane tanks at all facilities, but currently does not collect mattresses or EV batteries for diversion. Currently, mattresses are accepted at RDCK landfills for disposal. The RDCK should monitor the implementation of these programs and assess annually how the RDCK should participate in the programs. Mattresses and compressed gas cylinders are the best match with existing collection at landfills and larger transfer stations.
9. The three administrative sub-regions are unique to the RDCK, with only the RDEK operating with a similar system but the RDEK operates without tipping fees. There are benefits to a single centralized administrative system, such as more efficient decision-making processes, ability to apply a focused vision for the future state throughout the region, simplified organizational processes, and reduced administrative and managerial costs. The three sub-regional resource recovery service model can pose challenges in delivering efficient and effective waste management services. The Central and West facilities and operations are becoming more and more integrated increasing the complexity of cost allocation to sub-regions. The RDCK should consider undertaking the study highlighted in the RRP to assess the cost-benefit of regionalization versus the current sub-region model at minimum for the management of organics, recycling, and septage.

6. Closing

Overall, the RDCK Resource Recovery system is operated efficiently with equitable access to waste and recycling services across the sub-regions, and between rural and urban areas.

The benchmarking assessment indicated that the RDCK provides a slightly higher-than-average level of service and accessibility for waste and recycling services compared to similar regional districts. In addition, the RDCK has implemented robust organics management infrastructure, with the construction of two composting facilities, and four public collection points. The RDCK has made significant progress on organics diversion programs within the region and can expect to see increased organics diversion in the future as the program continues to be established and participation increases.

It is recognized that the RDCK achieves a reasonable value for service. At a high-level, this assessment is based on the tipping fee revenue generated as a percentage of the total cost of the system. The analysis of costs and revenue shows that up to 62% of the total system cost is recovered through tipping fees. Given the large geographic nature and requirements for the RDCK to maintain the system, the tax burden for services is reasonable and may be low compared with other regional districts.

The cost of the system per capita is similar to other regional districts, ranking third highest and \$10 per capita over the average, indicating that the RDCK is on the higher scale, but not unreasonable, comparatively. The RDCK's tipping fees for mixed waste ranks the highest within the scan, at \$54/tonne higher than the average. The RDCK's mixed waste tipping fees are on the high end of market rates.

The RDCK is currently recovering 62% of costs through tipping fees, and the remaining portion is recovered through taxes. This portion of cost recovery through tipping fees is higher than other regional districts, many of which are moving to a taxation model to recover 50-70% of system costs. Overall, the RDCK's cost recovery model is reasonable for the level of service provided. As diversion increases, the opportunities to increase tipping fees to

recover additional costs will be less (i.e. tipping fees can only go so high before waste departs the region) and the RDCK will have to transition to recovering over 50% of the system costs through taxation rather than tipping fees. Tipping fees can be increased in the short term, but the more successful the diversion programs, the more the need to recover costs through taxation, as waste will be shifting from categories with high tipping fees to categories with lower or no tipping fees.

This study identified a potential opportunity for increased efficiency and increased equitability by sharing costs and revenues between the sub-regions. The RDCK may consider undertaking a regionalization study to further determine the feasibility of this action. Incremental changes have been proposed including increased tipping fees for some materials to better recover the costs to manage those materials, the closure of three satellite recycling depots and reducing hours of operation at three core recycling depots.

The administrative sub-regions add a level of complexity to managing waste in the RDCK that reduces administrative efficiency. The tipping fee revenue collected in the West sub-region is much higher than in the Central sub-region indicating that the West sub-region is potentially subsidizing its programs with tipping fee revenues from materials such as commercial waste, soils, and septage from the Central sub-region as it hosts the primary landfill for these sub-regions. The waste systems between the West and Central are now highly integrated and allocation of costs is complicated and can lead to unequal taxation based on the taxation structure and interpreted cost allocations. The allocation of costs from shared services is time consuming, staff time could be better allocated to operating the system and executing the planned capital projects.

Appendices

Appendix A

**Service Level Benchmarking - Detailed
Facility Summary Table**

Regional District	No.	Facility	Type	Hours of Operation (summer/hrs/week)
RDCK	East Sub Region			
	1	Boswell Transfer Station	Transfer Station/Satellite Depot	8
	2	Crawford Bay Transfer Station	Transfer Station/Core Depot	18
	3	Creston Depot	Core Depot	40
	4	Creston Landfill	Landfill/Satellite Depot	35
	5	Yahk Transfer Station	Transfer Station/Satellite Depot	4
	6	Riondel	Satellite Depot	5
	Central Sub Region			
	7	Balfour Transfer Station	Transfer Station/Core Depot	28
	8	Kaslo Transfer Station	Transfer Station/Core Depot	18
	9	Marblehead (Meadow Creek) Transfer Station	Transfer Station/Satellite Depot	8
	10	Grohman Narrows (Nelson) Transfer Station	Transfer Station/Satellite Depot	54
	11	Central (Salmo) Transfer Station	Transfer Station	12
	12	Ymir Transfer Station	Transfer Station/Satellite Depot	6
	13	Salmo	Core Depot	24
	14	Nelson - Lakeside	Core Depot	54
	15	Kokanee Park Marina Satellite Depot	Satellite Depot	22.5
	16	Nelson Leafs Recycling Centre	Eco-Depot	34
	Western Sub Region			
	16	Burton Transfer Station	Transfer Station/Satellite Depot	4
	17	Crescent Valley	Core Depot	35
	18	Edgewood Transfer Station	Transfer Station/Core Depot	8
	19	Nakusp Landfill	Landfill/Core Depot	21
	20	Ootischenia (Castlegar) Landfill	Landfill/Core Depot	54
21	Rosebery Transfer Station	Transfer Station	12	
22	Slocan Transfer Station	Transfer Station/Core Depot	18	
23	Winlaw	Satellite Depot	12	
24	New Denver	Core Depot	18	
CRD	North Cariboo			
	1	Baker Creek Transfer Station	Transfer Station	60
	2	Alexandria Transfer Station	Transfer Station	24/7
	3	Cottonwood Transfer Station	Transfer Station	24/7
	4	Titetown Transfer Station	Transfer Station	24/7
	5	Wells Transfer Station	Transfer Station	24/7
	Central Cariboo			
	6	150 Mile Transfer Station	Transfer Station	63
	7	Central Cariboo Transfer Station	Transfer Station/Recycling Depot	70
	8	Frost Creek Transfer Station	Transfer Station	60
	9	Horsefly Recycling Depot	Transfer Station/Recycling Depot	63
	10	McLeese Lake Transfer Station	Transfer Station/Recycling Depot	8
	11	Wildwood Transfer Station	Transfer Station/Recycling Depot	60
	12	Big Lake Landfill	Landfill	24/7
	13	Chimney/Felker Transfer Station	Transfer Station	24/7
	14	Likely Landfill	Landfill/Recycling Depot	24/7
	South Cariboo			
	15	Forest Grove Transfer Station	Transfer Station/Recycling Depot	57.5
	16	Interlake Landfill	Landfill/Recycling Depot	60
	17	Lac La Hache Transfer Station	Transfer Station/Recycling Depot	58
	18	Lone Butte Transfer Station	Transfer Station/Recycling Depot	60
	19	South Cariboo Landfill	Landfill/Recycling Depot	63
	20	Watch Lake Landfill	Landfill/Recycling Depot	54
	21	Eagle Creek Transfer Station	Transfer Station	24/7
	22	Mahood Lake Landfill	Landfill	24/7
	Chilcotin			
	23	Alexis Creek Transfer Station	Transfer Station	24/7
	24	Cochin Lake Landfill	Landfill	24/7
	25	Kleena Kleene Landfill	Landfill	24/7
	26	Nemaiah Valley Landfill	Landfill	24/7
27	Puntzi Lake Landfill	Landfill	24/7	
28	Riske Creek Transfer Station	Transfer Station	24/7	
29	Tatla Lake Landfill	Landfill	24/7	
30	West Chilcotin Landfill	Landfill	24/7	
	1	Golden Landfill	Landfill/Recycling Depot	36
	2	Revelstoke Landfill	Landfill/Recycling Depot	36
	3	Sicamous Landfill	Landfill/Recycling Depot	30
	4	Salmon Arm Landfill	Landfill/Recycling Depot	56
	5	Scotch Creek Transfer Station	Transfer Station/Recycling Depot	35
	6	Skimikin Transfer Station	Transfer Station/Recycling Depot	30

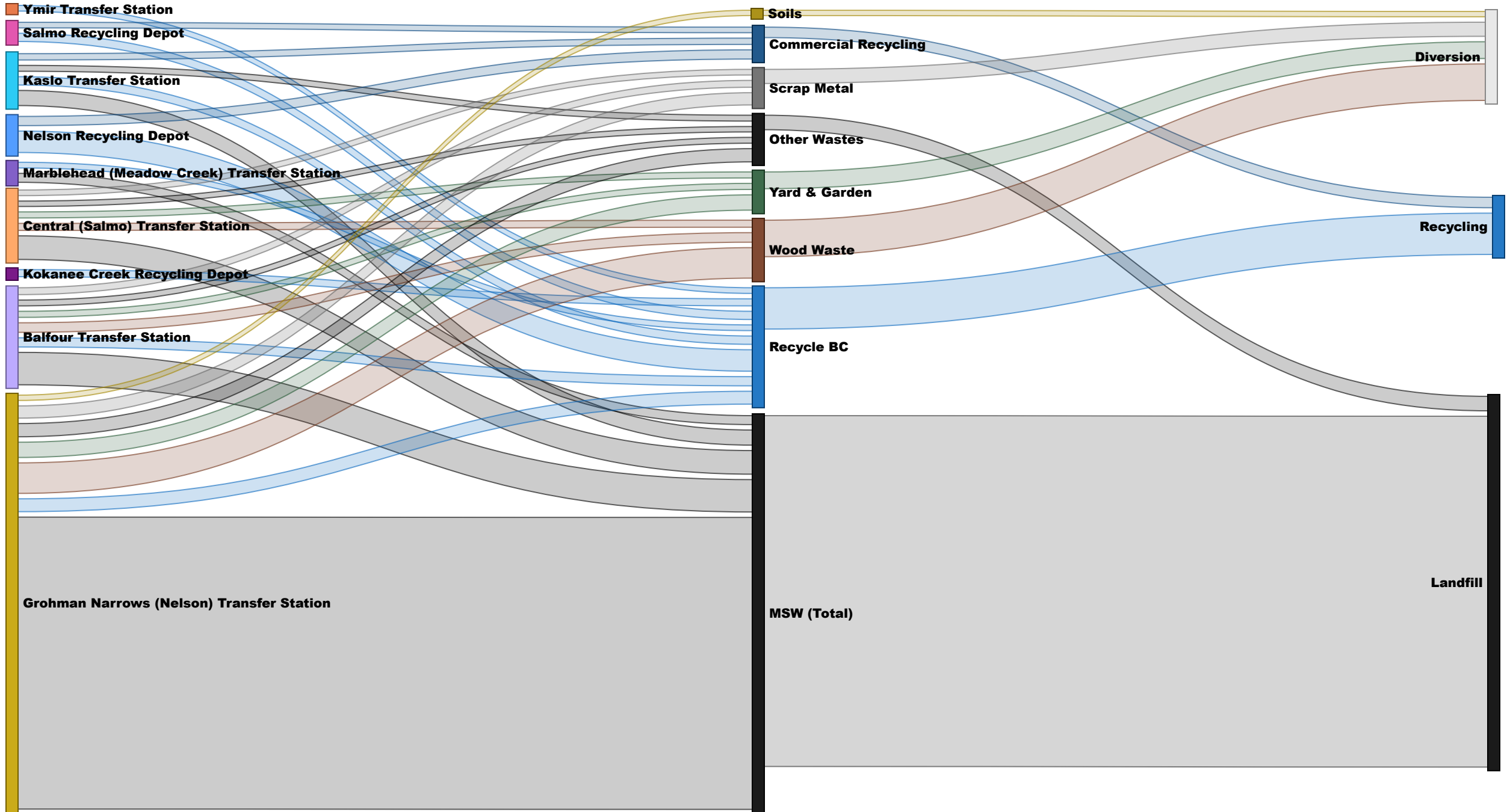
Regional District	No.	Facility	Type	Hours of Operation (summer/hrs/week)
CSRD	7	Falkland Transfer Station	Transfer Station/Recycling Depot	18
	8	Glenemma Transfer Station	Transfer Station/Recycling Depot	12
	9	Malakwa Transfer Station	Transfer Station/Recycling Depot	14
	10	Parson Transfer Station	Transfer Station/Recycling Depot	8
	11	Seymour Arm Transfer Station	Transfer Station/Recycling Depot	4
	12	Trout Lake Transfer Station	Transfer Station/Recycling Depot	4
	13	Kicking Horse Recycling Depot	Recycling Depot	24
	14	Sorrento Recycling Depot	Recycling Depot	24
	15	Malakwa Recycling Station	Recycling Depot	12
	16	Sicamous Return-It Depot	Recycling Depot	35
	17	Revelstoke Bottle Depot	Recycling Depot	37.5
18	Bills Bottle Depot	Recycling Depot	56	
19	Golden Bottle Depot	Recycling Depot	26	
RDEK	Columbia Valley Sub Region			
	1	Columbia Valley Landfill	Landfill/Recycling Depot	63
	2	Brisco Transfer Station	Transfer Station/Recycling Depot	24/7
	3	Canal Flats Transfer Station	Transfer Station/Recycling Depot	24/7
	4	Edgewater Transfer Station	Transfer Station/Recycling Depot	24/7
	5	Fairmont Transfer Station	Transfer Station/Recycling Depot	24/7
	6	Invermere Transfer Station	Transfer Station/Recycling Depot	63
	Central Subregion			
	7	Central Subregion Landfill	Landfill/Recycling Depot	54
	8	Cranbrook Transfer Station	Transfer Station/Recycling Depot	63
	9	Kimberly Transfer Station	Transfer Station/Recycling Depot	63
	10	Baynes Lake Transfer Station	Transfer Station/Recycling Depot	24/7
	11	Elko Transfer Station	Transfer Station/Recycling Depot	24/7
	12	Fort Steele Transfer Station	Transfer Station/Recycling Depot	24/7
	13	Grasmere Transfer Station	Transfer Station/Recycling Depot	24/7
	14	Green Bay/Monroe Lake Transfer Station	Transfer Station/Recycling Depot	24/7
	15	Moyie/Sunrise Transfer Station	Transfer Station/Recycling Depot	24/7
	16	Newgate Transfer Station	Transfer Station/Recycling Depot	24/7
	17	Sheep Creek Transfer Station	Transfer Station/Recycling Depot	24/7
	18	Tie Lake Transfer Station	Transfer Station/Recycling Depot	24/7
	19	Wardner Transfer Station	Transfer Station/Recycling Depot	24/7
	20	Wasa Transfer Station	Transfer Station/Recycling Depot	24/7
	Elk Valley Subregion			
21	Elkford Transfer Station	Transfer Station/Recycling Depot	48	
22	Sparwood Landfill	Landfill/Recycling Depot	48	
23	Fernie Transfer Station	Transfer Station/Recycling Depot	52	
RDFFG	1	Bear Lake Regional Transfer Station	Transfer Station	10
	2	Berman Lake Regional Transfer Station	Transfer Station/Recycling Depot	38
	3	Buckhorn Regional Transfer Station	Transfer Station/Recycling Depot	36
	4	Chief Lake Regional Transfer Station	Transfer Station/Recycling Depot	36
	5	Cummings Road Regional Transfer Station	Transfer Station/Recycling Depot	32
	6	Dunster Regional Transfer Station	Transfer Station/Recycling Depot	37
	7	Foothills Boulevard Regional Landfill	Landfill	66
	8	Hixon Regional Transfer Station	Transfer Station/Recycling Depot	22
	9	Legrand Demolition and Construction Waste Landfill	Landfill	24/7
	10	Mackenzie Regional Transfer Station	Transfer Station/Recycling Depot	40
	11	Mackenzie Select Waste Landfill (C&D)	Landfill	40
	12	McBride Regional Transfer Station	Transfer Station/Recycling Depot	46
	13	McLeod Lake Regional Transfer Station	Transfer Station	24/7
	14	Miworth Regional Transfer Station	Transfer Station	24/7
	15	Quinn Street Recycling Depot and Transfer Station	Transfer Station/Recycling Depot	40
	16	Shelley Regional Transfer Station	Transfer Station/Recycling Depot	36
	17	Summit Lake Regional Transfer Station	Transfer Station	24/7
	18	Valemount Regional Transfer Station	Transfer Station/Recycling Depot	46
	19	Vanway Recycling Depot and Transfer Station	Transfer Station/Recycling Depot	56
	20	West Lake Regional Transfer Station	Transfer Station/Recycling Depot	30
	21	Willow River Regional Transfer Station	Transfer Station/Recycling Depot	36
RDKB	Greater Trail Area			
	1	McKelvey Creek Landfill	Landfill/Recycling Depot	64
	Boundary Area			
	2	Grand Forks Landfill	Landfill/Recycling Depot	41.5
	3	Christina Lake Transfer Station	Transfer Station/Recycling Depot	25
West Boundary Area				
4	West Boundary (Greenwood) Landfill	Landfill/Recycling Depot	21	
5	Beaverdell Transfer Station	Transfer Station/Recycling Depot	8	

Regional District	No.	Facility	Type	Hours of Operation (summer/hrs/week)
	6	Rock Creek Transfer Station	Transfer Station/Recycling Depot	26
	7	Christian Valley Transfer Station	Transfer Station	24/7
	8	Idabel Lake Transfer Station	Transfer Station/Recycling Depot	24/7
	9	Mt. Baldy Transfer Station	Transfer Station/Recycling Depot	24/7
	10	Big White Transfer Station	Transfer Station/Recycling Depot	24/7
RDOS	1	Pentitcton (Campbell Mountain) Landfill	Landfill/Recycling Depot	56
	2	Oliver Landfill	Landfill/Recycling Depot	42
	3	Okanagan Falls Landfill	Landfill/Recycling Depot	24
	4	Keremeos Landfill	Landfill/Recycling Depot	12
	5	Apex Transfer Station	Transfer Station/Recycling Depot	24/7
TNRD	1	70 Mile Eco-Depot	Recycling Depot	35
	2	Agate Bay Transfer Station	Transfer Station/Recycling Depot	4
	3	Aspen Grove Transfer Station	Transfer Station/Recycling Depot	4
	4	Black Pines Transfer Station	Transfer Station/Recycling Depot	4
	5	Blue River Eco Depot	Recycling Depot	16
	6	Boston Flats Eco Depot	Recycling Depot	48
	7	Brookmere Transfer Station	Transfer Station/Recycling Depot	4
	8	Clearwater Eco Depot	Recycling Depot	48
	9	Clinton Eco Depot	Recycling Depot	32
	10	Eagan Lake Transfer Station	Transfer Station/Recycling Depot	4
	11	Heffley Creek Eco Depot	Recycling Depot	48
	12	Knutsford Transfer Station	Transfer Station/Recycling Depot	40
	13	Lac Le Jeune Transfer Station	Transfer Station/Recycling Depot	8
	14	Logan Lake Eco Depot	Recycling Depot	48
	15	Loon Lake Transfer Station	Transfer Station/Recycling Depot	24
	16	Louis Creek (Barriere) Eco-Depot	Recycling Depot	48
	17	Lower Nicola (Merritt) Eco-Depot	Recycling Depot	56
	18	Lytton Eco Depot	Recycling Depot	30
	19	Paul Lake Transfer Station	Transfer Station/Recycling Depot	40
	20	Savona Transfer Station	Transfer Station/Recycling Depot	24
	21	South Thompson (Pritchard) Eco-Depot	Recycling Depot	48
	22	Spences Bridge Transfer Station	Transfer Station/Recycling Depot	16
	23	Sun Peaks Transfer Station	Transfer Station/Recycling Depot	40
	24	Tranquille Valley Transfer Station	Transfer Station/Recycling Depot	8
	25	Upper Nicola Transfer Station	Transfer Station/Recycling Depot	32
	26	Vavenby Transfer Station	Transfer Station/Recycling Depot	16
	26	Westwold Transfer Station	Transfer Station/Recycling Depot	16
	28	Heffley Creek Landfill	Landfill	48
	29	Lower Nicola Landfill	Landfill	56

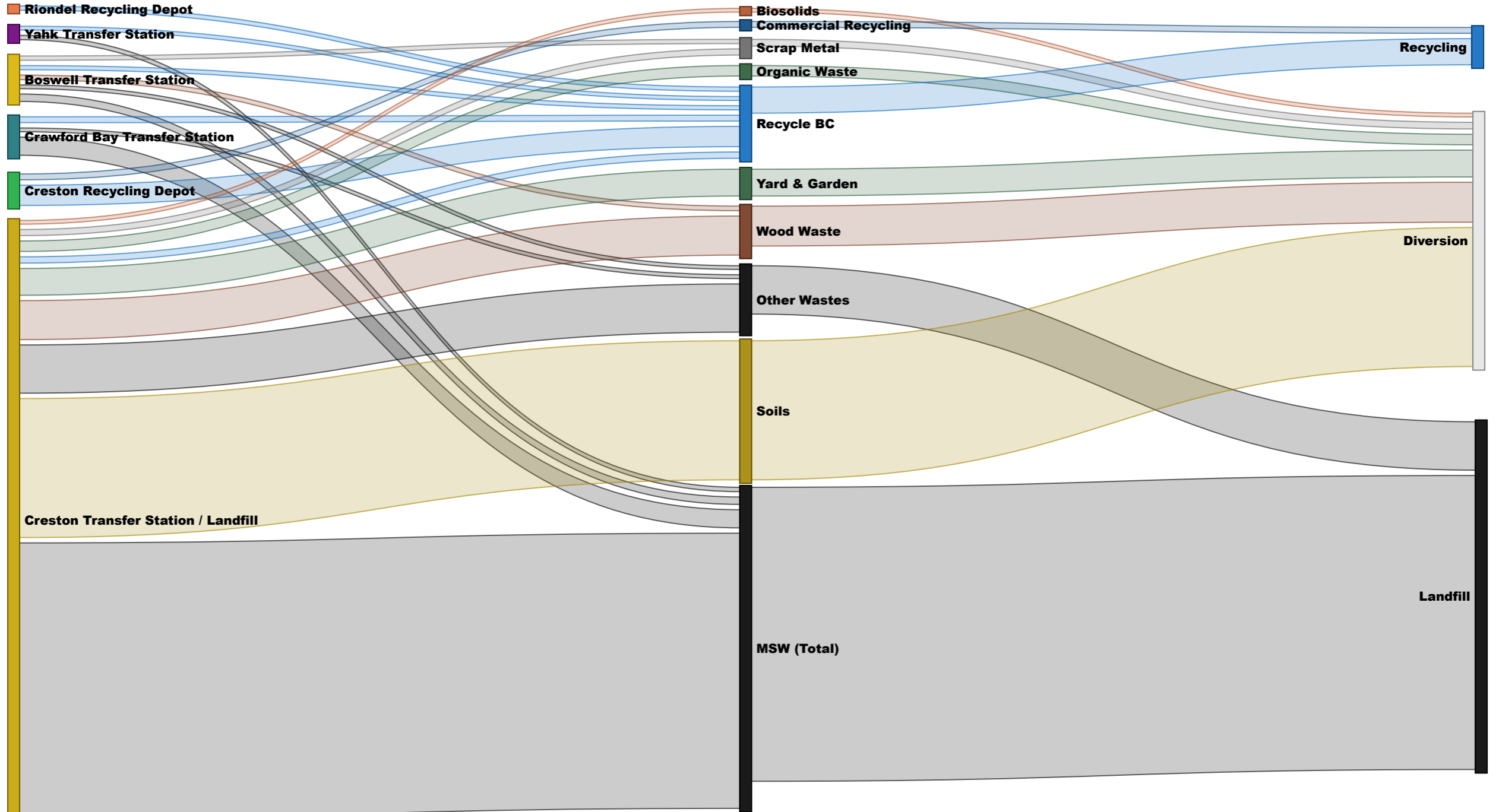
Appendix B

Waste Flow Mapping Figures

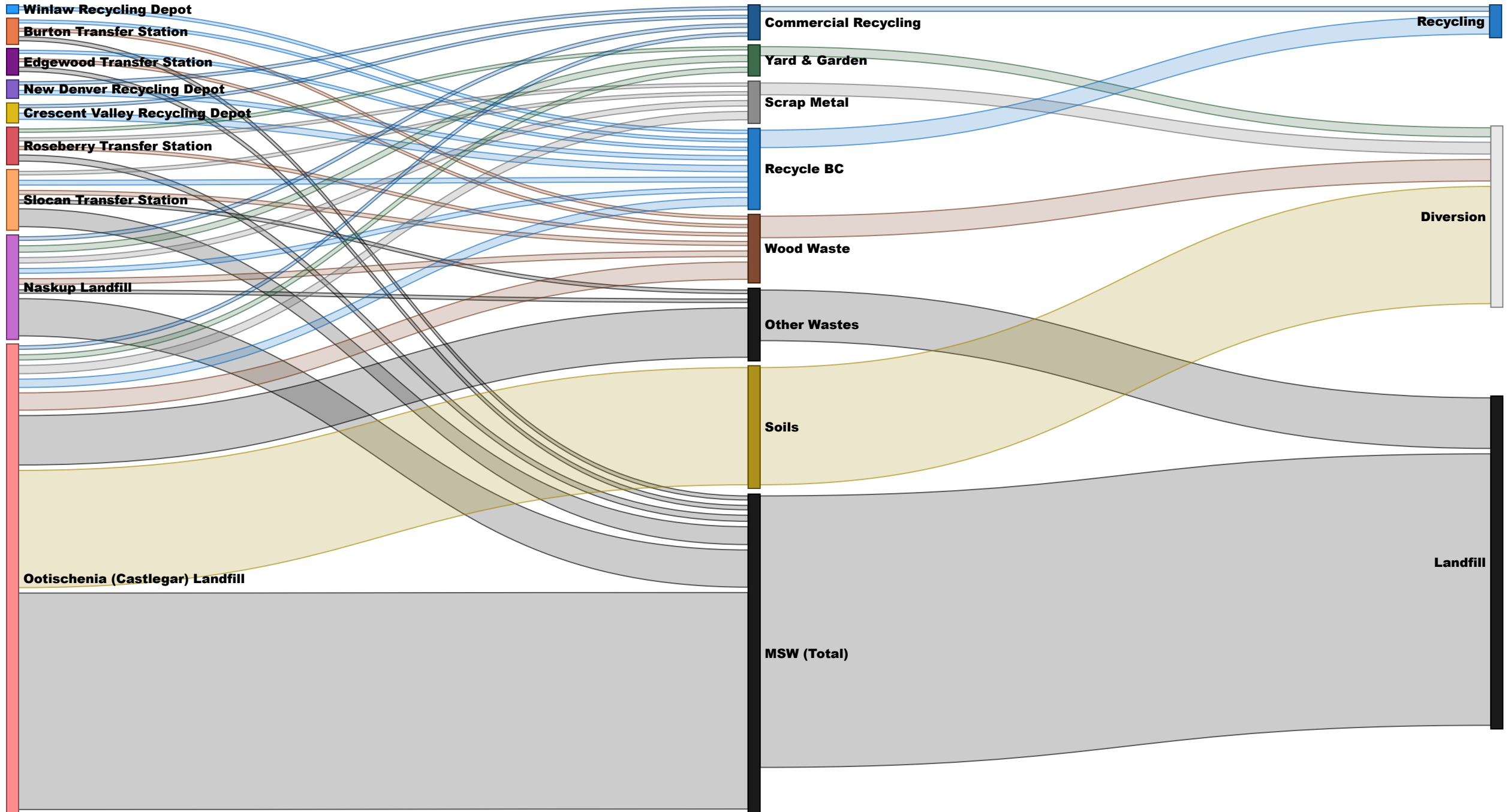
Waste Flow Sankey: Central Sub-Region (By Weight)



Waste Flow Sankey: East Sub-Region (By Weight)



Waste Flow Sankey: West Sub-Region (By Weight)





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