



Metro Vancouver Recycling and Solid Waste Management 2021 Report

[FINAL DRAFT]

Note: This draft was updated on August 2, 2024 to correct an error in the C&D tonnage disposed (Updated from 371,972 tonnes to 359,296 tonnes)



Metro Vancouver is responsible for waste reduction, recycling planning, and the operation of a series of solid waste facilities in the region. Planning for less waste, improving reuse and recycling systems, and managing the remaining waste reflects the public's expectations of high environmental stewardship and affordable and accessible waste management. This document summarizes the recycling and solid waste management activities that took place in the calendar year 2021. These activities are guided by Metro Vancouver's *Integrated Solid Waste and Resource Management Plan* (ISWRMP) which was approved by the province in July 2011.

2021 PROGRAM HIGHLIGHTS

For more details on Metro Vancouver Solid Waste programs and campaigns, visit www.metrovancouver.org and type "solid waste" in the search bar.

POLICY & PLANNING

Continued the process of updating the solid waste management plan, including the completion of a pre-engagement phase to determine preferred communication channels, methods of participation, information needs, and ways to facilitate participation by a broad range of audiences. This was conducted based on guidance provided by the Solid Waste Management Plan Independent Consultation and Engagement Panel.

Implemented a new recycling depot funding strategy that incorporates the operating costs of recycling depots located at Metro Vancouver's recycling and waste centres into the garbage tipping fees.

Updated Metro Vancouver's Construction & Demolition toolkit to increase awareness of reuse and recycling of building materials and provide a centralized source of information for contractors, designers, and homeowners.

Developed a regionally harmonized approach to municipal single-use item reduction bylaws to aid in working toward a consistent regulatory framework for reducing the use of single-use items in member jurisdictions.

NATIONAL ZERO WASTE COUNCIL

Published *Opportunities for Reusables in Retail Settings during the COVID-19 Pandemic in Canada: A Review of Guidance and Evidence* which examined the science behind the risk of reusables during the pandemic. The review indicated that reusables are perfectly safe as long as COVID safety measures are maintained.

Played a leadership role in the creation of the Canada Plastics Pact (CPP). The new organization should accelerate the transition to a circular plastics economy for packaging by mobilizing leaders from across Canada's plastic value chain and broader ecosystem behind a common vision and ambitious set of goals.

Released the first of its kind report, *Waste Prevention: Environmental and Economic Opportunities for Canada*. The report examines the potential impact of implementing waste prevention interventions in six sectors of the Canadian economy: construction, healthcare, manufacturing, agriculture, plastics, and retail. Estimates are that these interventions have the potential, on an annual basis, to prevent 5 million tonnes of CO2e emissions and 4.9 million tonnes of waste, including 1.1 million tonnes of plastics, while creating about 20,000 jobs and \$41 billion in cost savings or additional revenue.

NATIONAL ZERO WASTE COUNCIL

Launched the Canadian Circular Cities and Regions Initiative (CCRI) as a one-year national pilot in partnership with the Federation of Canadian Municipalities, Recycling Council of Alberta and RECY-QUEBEC to support the journey to a circular economy for local governments in Canada through knowledge-sharing and capacity building.

PROGRAMS & RESEARCH

Partnered with the City of Burnaby on a smart bin pilot project to assess benefits and limitations of using artificial intelligence-enabled sensors to identify banned items and fullness levels in garbage dumpsters.

Initiated procurement for the processing of approximately 60,000 tonnes per year of small load waste to recover recyclables and alternative fuel with the potential to reduce GHG emissions by up to 20,000 tonnes per year.

Initiated procurement for a pilot study to demonstrate the potential for beneficial use of 40,000 tonnes per year of bottom ash. The bottom ash will be processed for use by a cement kiln in the production of cement, reducing greenhouse gas emissions related to the use of mined aggregate material and reducing landfill disposal of municipal solid waste by approximately 5%.

Completed annual survey at regional recycling and waste centres which showed high levels of customer satisfaction with respect to hours of operation (89%), level of service (82%), and range of materials (76%). 62% of customers also agreed that wait times were reasonable. This online survey was voluntary and was completed by approximately 150 customers.

Conducted two waste composition studies: a multi-family focused study looking at waste from apartments, and a full-scale study examining waste from all sectors received at recycling and waste centres.

Hired a researcher to estimate the types and tonnages of waste produced by the cannabis industry in the region to better understand the solid waste management impacts of the federal legalization of cannabis.

Partnered with FoodMesh to develop a regional food recovery network to help rescue and redistribute surplus food, moving food up the waste hierarchy to feed animals and people.

CAMPAIGNS & COMMUNICATION

Launched the “Superhabits” behaviour change campaign, with the objective to reduce the use and disposal of single-use items in Metro Vancouver by celebrating the small actions residents can take to reduce single-use items, making them everyday superheroes.

Eighth year of food scraps recycling education and awareness campaign: “Food Isn’t Garbage” with an interactive Green Bin Q&A and a segment focusing on multi-family residents and addressing their specific barriers to participating in food scraps recycling.

Sixth year of “More than Meets the Eye” promotion during Waste Reduction Week, providing recycling options for E-waste.

Eleventh year of “Create Memories Not Garbage” campaign which included the “Merry Memory Maker” app, allowing residents to search for low-waste gift ideas organized by price range and focused on recycling and disposing of online shopping packaging.

Fifth year of “Waste in its Place” campaign focused on digital advertising to raise awareness of legal disposal methods and programs. The 2021 campaign including updated messaging on construction and demolition debris disposal in response to a reported increase in illegal dumping of these materials in 2020.

Seventh year of a regional “Love Food Hate Waste” Canada household food waste prevention campaign, and the fourth year as a partner in the national campaign, managed by the National Zero Waste Council.

Third year of Metro Vancouver’s regional clothing waste reduction campaign, “Think Thrice About Your Clothes”. The 2021 campaign put an additional emphasis on reduction and reuse options in addition to encouraging clothing donation and recycling.

PROGRAMS & RESEARCH

Completed a compost quality study determining the amount and physical nature of foreign debris contamination in local compost, helping to identify opportunities for improving regional compost quality.

Partnered with Ocean Ambassadors on launching a reusable take-out container pilot to learn more about the feasibility of reusable container programs in the region.

EXTENDED PRODUCER RESPONSIBILITY PROGRAMS

Extended Producer Responsibility (EPR) programs, also called product stewardship programs, are industry-managed and designed to make producers and consumers responsible for regulated products and packaging throughout their life cycles.

- EPR holds producers and consumers accountable for the collection, recycling or safe disposal, as well as costs of regulated products at end-of-life.
- Most items managed through EPR programs are banned from disposal as garbage in Metro Vancouver recycling and waste centres.

The BC Ministry of the Environment and Climate Change Strategy consulted on its five-year action plan called *Advancing Recycling in BC*, including products within categories for future EPR programs. Specifically, the following product categories were explored:

- Mattresses and foundations.
- Moderately hazardous products, such as single-use propane canisters expanding existing EPR programs to include single-use items and packaging-like products to facilitate collection and recycling.
- Hybrid and electric vehicle batteries.

No new EPR programs were announced in 2021. A number of plan renewals were consulted on in 2021, including: the BC Smoke and Carbon Monoxide Alarm program, the Tire Stewardship BC program, the Electronic Products Recycling Association program, and the Major Appliance Recycling Roundtable program.

2021 RECYCLING AND SOLID WASTE SUMMARY

Metro Vancouver collects municipal solid waste, recycling, and disposal data in four categories: single-family residential, multi-family residential, commercial/institutional, and construction and demolition.

Following an anomalous year in 2020 due to the COVID-19 pandemic, in 2021 Metro Vancouver's solid waste system tonnages were more reflective of pre-pandemic waste and recycling generation habits, with less overall material generated by the residential sector and more generated by the commercial/institutional sector. These impacts are likely associated with the reopening of some businesses and institutions, the return to hybrid/in-person work and learning, and less time spent at home following the relaxation of some COVID-19 restrictions. In 2021, 2,351,848 tonnes of material were recycled and diverted from disposal in Metro Vancouver. This amounts to 65% of the waste generated in the region.

The remaining 1,242,493 tonnes of solid waste were sent for disposal at the Vancouver Landfill, the Metro Vancouver Waste-to-Energy Facility, and two remote landfills under contract to Metro Vancouver. Metro Vancouver continues to be among the most successful communities in North America with respect to waste reduction and recycling. Metro Vancouver is also currently updating its solid waste management plan, building on the strengths of the current plan, and identifying opportunities for accelerated waste reduction and diversion while reducing greenhouse gases and promoting a circular economy.

Table 1 below presents recycling and solid waste disposal quantities for each sector. In 2021, Metro Vancouver allocated the distribution of EPR recycling tonnages to the single-family, multi-family, and commercial/institutional sectors (see note 3 in **Table 1**). **Appendix 1** includes a similar table with a comparison to the previous year.

FIGURE 1: METRO VANCOUVER RECYCLING & SOLID WASTE TOTALS 2021

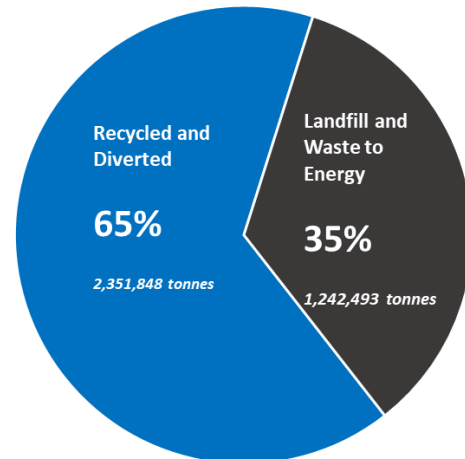


Table 1: Metro Vancouver Recycling and Solid Waste Quantities in 2021

WASTE SECTOR	DISPOSED (tonnes)	RECYCLED (tonnes)	RECYCLING RATE ⁽³⁾ (%)	DISPOSED (tonnes/capita)	DISPOSED (tonnes/household)
Residential	510,337	601,509	54%	0.18	0.47
Single Family ⁽¹⁾ Population ⁽⁴⁾ = 1,656,892	266,999	455,723	63%	0.16	0.52
Multi-Family ⁽²⁾ Population ⁽⁴⁾ = 1,150,577	243,337	145,786	37%	0.21	0.41
Commercial/Institutional ⁽²⁾ Employees ⁽⁴⁾ = 1,430,200	372,861	316,406	46%	0.13	0.34
Construction & Demolition ⁽⁵⁾	359,296	1,433,933	79%	0.13	0.33
TOTAL	1,242,493	2,351,848	65%	0.44	1.15

- (1) Reported tonnes of disposed and recycled waste are obtained from member jurisdiction reports, private recycling and processing facility records, landfill records, or product stewardship association records. This includes residential drop-off tonnages.
- (2) Estimated tonnes of disposed waste are based on per capita multi-family disposal rates and the total recycling and waste centre weigh scale reports for commercial waste, which includes multi-family and commercial/institutional tonnages. A calculated portion of that total is then attributed to each sector. Multi-family recycling is reported by member jurisdictions and combined with estimated residential drop-off tonnages.
- (3) The total recycling rate includes EPR tonnages. The recycling rates for individual sectors also include EPR tonnages, based on estimates of the relative contributions to EPR tonnages from single-family homes (54%), multi-family homes (36%), and businesses (10%) with the exception of Recycle BC tonnages that are allocated 60% to the single-family sector and 40% to the multi-family sector.
- (4) Population, employment and housing figures are based on 2021 projections provided by Metro Vancouver's Regional Planning Department and are based on 2016 census data.
- (5) Reported tonnes of recyclable materials and disposed waste are obtained from private licensed brokers, composters and transfer stations, and from unlicensed recycling facilities. As Metro Vancouver becomes aware of new facilities and other facilities close, the total number of facilities and the resultant tonnages may change.

Metro Vancouver's Recycling and Solid Waste Management System

Metro Vancouver's integrated recycling and solid waste management system provides service to the residents and businesses of 21 member jurisdictions, one Electoral Area and one Treaty First Nation.

Metro Vancouver currently operates six¹ recycling and waste centres where residents and businesses drop off garbage, yard trimmings and a variety of other recyclable materials. In addition to the Metro Vancouver facilities, some member jurisdictions operate their own recycling depots. Waste remaining after recycling is managed at the Metro Vancouver Waste to-Energy Facility and the Vancouver Landfill. The Vancouver Landfill and Vancouver Transfer Station are owned and operated by the City of Vancouver. Garbage in excess of what can be managed at local facilities is shipped to remote landfills for disposal. Metro Vancouver also created the National Zero Waste Council in 2013 and runs a number of behaviour change campaigns such as Love Food Hate Waste, Food Scraps Recycling, Create Memories not Garbage, and Think Thrice About Your Clothes.

Below is an overview of Metro Vancouver's solid waste system. A more detailed description of each of Metro Vancouver's five recycling and waste centres that operated in 2021 can be found in **Appendix 2**.



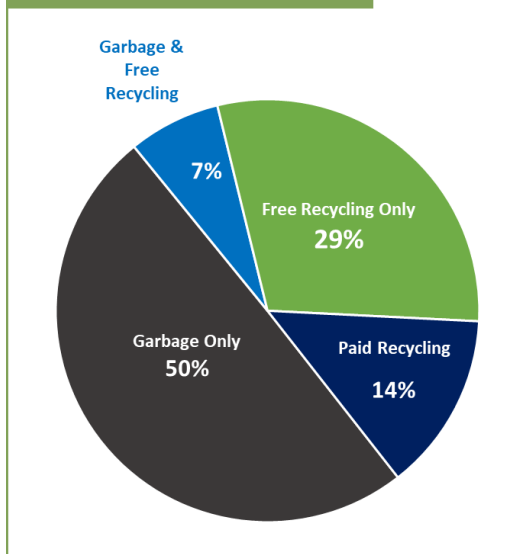
* Garbage received at Metro Vancouver and City of Vancouver facilities (from residential and commercial/institutional sources) totalled 976,229 tonnes in 2021, including 6,075 tonnes of out-of-region flood relief material resulting from the catastrophic atmospheric river events in November 2021.

Table 2: Metro Vancouver Facilities in 2021

MATERIAL(S)	CUSTOMERS	TONNES
Garbage	636,850	670,626
Clean Wood, Organics & Other Paid Recycling	137,299	50,903
Gypsum	15,870	2,194
Mattresses	78,202 units	2,113
Free Recycling	411,417	10,100

Annual customers: 1,122,361
Regional Garbage: 976,229 tonnes*
Paid Recycling: 55,210 tonnes
Free Recycling: 10,100 tonnes
 (includes 140 tonnes of textiles and 111 tonnes of books collected through charities)

FIGURE 2: OVERALL CUSTOMER USE OF SOLID WASTE FACILITIES 2021



¹ The United Boulevard and Central Surrey Recycling and Waste Centres opened in 2022 and therefore are not included in the data presented in this report, which only includes data from 2021 and prior.

Reuse

In 2017, Metro Vancouver added the reuse metric, which quantifies the amount of material reused rather than recycled or disposed. Reuse is defined as materials reused mostly in its original form without processing that significantly changes its structure. In contrast, recycling involves processes that alter the structure of materials and allows them to be remanufactured into new products. Examples of reused materials include clothing donated and/or resold, certain minimally-processed EPR materials, donated foods, reused furniture and office equipment, salvaged building materials, and other items kept out of waste and recycling streams. The data used to estimate reuse include registered charities' financial statements, EPR annual reports, statistics from Statistics Canada, published information from reuse program web pages, and communication with key organizations in the second-hand clothing industry, hospitality sector, food rescue organizations, online marketplace, etc.

Reuse activity is reported separately from the recycling rate calculation because the reuse estimate is still new and has a substantial degree of uncertainty. Also, historical estimates of the recycling rate did not include reuse, so including it now would preclude comparisons with prior years. The methodology used to estimate reuse continues to be refined.

Table 3 below shows the estimate of reuse in Metro Vancouver in 2021. In 2021, it is estimated that about 77,600 tonnes of material was reused in the Metro Vancouver region. Reuse in the clothing and food recovery industries increased to pre-pandemic levels. Many charities that temporarily restricted clothing donations returned to pre-pandemic operations and some food recovery organizations returned to distributing food as opposed to grocery gift cards.

Table 3: Estimate of Reuse in Metro Vancouver in 2021

MATERIAL CATEGORY	ANNUAL REUSE (tonnes) ROUNDED VALUE (to nearest 100 tonnes)
Textiles and Accessories - Sold	11,900
Textiles and Accessories - Industrial Wipes	5,500
EPR Programs	17,300
Food	7,600
Hotels and Hospitality Sector	400
Office Furniture	1,400
IT Equipment	1,600
Construction/Demolition Materials	4,800
On-Line for Selected Materials ²	27,400
TOTAL	77,900

² Refers to materials bought and sold in the online marketplace i.e. Kijiji, Craigslist etc.

Recycling

Member jurisdictions historically provided recycling collection services for the single-family residential sector, some parts of the multi-family residential, and some parts of the commercial/institutional sector. Since 2015, Recycle BC, an extended producer responsibility agency, has been responsible for curbside recycling of packaging and paper from single-family and multi-family homes. Additionally, member jurisdiction and private recycling depots and return to retail locations offer the collection of many recyclable materials not accepted in Recycle BC's curbside recycling program, such as film plastics, batteries, and beverage containers. Private facilities primarily manage recyclables from the commercial/institutional and construction and demolition sectors.

Despite the continued challenges brought on by COVID-19, the regional recycling rate increased and materials with the highest recycling quantities were concrete, yard and food, and paper/paper products. **Appendix 1** shows recycling and diversion rates by sector for 2019, 2020, and 2021. In 2021, the diversion rates in the commercial/institutional and construction and demolition sectors increased by 2% and 1%, respectively, while the residential sector decreased by 1%.

An increase in commercial activity correlates with an increase in recycling in the commercial/institutional sector; however, the residential sector experienced a comparable decrease in recyclable material, particularly yard and food waste. However, while yard and food waste recycling in the residential sector has decreased, it also increased in the commercial and institutional sector, pointing towards a return to pre-pandemic business operations in typical food waste generating sectors such as restaurants whose operations were heavily impacted by COVID-19 restrictions.

Concrete recycling increased by 8% while no new data on asphalt recycling was received, resulting in 2020 numbers being carried forward to 2021. Asphalt and concrete generated by construction and demolition activity are typically considered municipal solid waste, while material originating from road construction is excluded. However, it is challenging to determine the origin of the material as asphalt and concrete recyclers are not currently licensed by Metro Vancouver and staff rely on voluntary reporting. More detail on how this material is obtained, and how the tonnage of heavy materials such as concrete and asphalt impacts the overall recycling rate is provided in the methodology section.

Table 4 below presents the quantities and types of recyclables collected in 2021.

Table 4: Quantities of Materials Recycled in Metro Vancouver in 2021

MATERIAL TYPE	TOTAL ⁽¹⁾ (tonnes)
Asphalt ⁽²⁾	295,300
Batteries	13,858
Concrete ⁽³⁾	866,363
Electronic & Electrical Equipment	11,213
Paper/Paper Products	328,065
Glass	49,786
Gypsum	63,533
Household Hazardous Waste	21,292
Metal	73,369
Plastic	43,849
Textiles	691
Tires	21,328
Wood	161,309
Yard & Food	401,890
TOTAL	2,351,848

(1) Starting in 2019, the Major Appliance Recycling Roundtable started reporting the tonnages of material recovered through their stewardship program report instead of the estimated number of units. This new methodology is much more accurate than the previous methodology.

(2) No new data received for the 2021 calendar year, estimates are carried forward from 2020.

(3) One facility reported an increase in excess of Metro Vancouver's 50% threshold without verifiable evidence. The increase was capped at 50% as per the methodology provided in this report.

Materials Recycled through EPR Programs

Extended Producer Responsibility (EPR) programs, also called product stewardship programs, are industry-managed programs designed to shift the costs and responsibilities for managing regulated products and packaging, throughout their lifecycles, from local governments to producers and consumers. EPR holds producers and consumers accountable for the costs and management of regulated products at its end-of-life. Most items managed through EPR programs are banned from disposal at Metro Vancouver recycling and waste centres, and are recycled before they enter the region's solid waste management system.

In 2021, nineteen stewardship agencies reported recycling tonnages for Metro Vancouver for a total of 246,596 tonnes. This total is added to Metro Vancouver's recycling tonnage. See **Table 5** for a breakdown of materials collected by each stewardship agency.

Table 5: Quantities of Materials Recycled through EPR Programs in 2021

EPR PROGRAM	TOTAL (tonnes)	MATERIAL TYPES
BC Used Oil Management Association (BCUOMA)	20,730	Oil, Antifreeze, Filters, Containers
Call2Recycle	442	Consumer Batteries <5 kg
Recycle My Cell	1	Cell Phones
Canadian Battery Association (CBA)	13,415	Lead Batteries
Canadian Beverage Association	290	Beverage Refrigeration Units
Major Appliance Recycling Roundtable (MARR)	11,856	Major Appliances
Recycle BC	110,700	Packaging and Paper Products
BC Brewers Recycled Container Collection Council (BRCCC)	10,099	Alcohol Containers and Packaging
Encorp Pacific (Canada)	41,215	Beverage Containers
Canadian Electrical Stewardship Association (CESA)	2,548	Portable Electrical Appliances
Electronic Products Recycling Association (EPRA)	7,103	Electronics
Health Products Stewardship Association (HPSA)	46	Medication
AlarmRecycle - Product Care	12	Smoke and Carbon Monoxide Alarms
BC Paint & HHW - Product Care	3,115	Paint, Household Hazardous Waste
BC Lights Program - Product Care	1,225	Lighting and Light Fixtures
Thermostat Recovery Program	0.1	Thermostats
TELUS Communications Inc.	324	Electronics
Tire Stewardship BC	18,854	Tires
News Media Canada	4,620	Newsprint
TOTAL	246,596	

Disposed Waste

Residential and commercial/institutional waste disposal is handled through the regional solid waste management system. In 2021, the Regional Facilities consisted of:

- six recycling and waste centres, including the Vancouver South Transfer Station
- Vancouver Landfill
- Waste-to-Energy Facility in Burnaby
- Contracted contingency disposal at remote landfills (as of mid-2017)

The use of the Cache Creek Landfill by Metro Vancouver ceased in 2016. In mid-2017, Metro Vancouver began using alternative remote disposal facilities for waste in excess of what can be handled by in-region disposal facilities. All municipal solid waste delivered to the regional disposal facilities (landfills and waste-to-energy facility), as well as waste disposed out-of-region from Regional Facilities, is accounted in Metro Vancouver's disposal calculations. Construction and demolition waste is primarily handled separately from the regional solid waste management system and is disposed at either licensed private landfills or the Vancouver Landfill. In 2021, the residential, commercial/institutional, and construction and demolition sectors in Metro Vancouver disposed of a total 1,242,493 tonnes of waste to the regional system and private disposal facilities. The current per capita disposal rate in the region is 0.44 tonnes per person.

In 2021, Metro Vancouver residents, businesses, and institutions achieved an overall recycling rate of 65%. **Figures 3 and 4**, below, show changes in the regional recycling rate from all waste sectors, and the total per capita generation, disposal and recycling rates for the region since 1994. **Table 6** shows Metro Vancouver's regional waste and recycling figures. **Table 7** highlights the single-family residential recycling and solid waste figures.

FIGURE 3: REGIONAL RECYCLING RATE FOR WASTE FROM ALL SECTORS

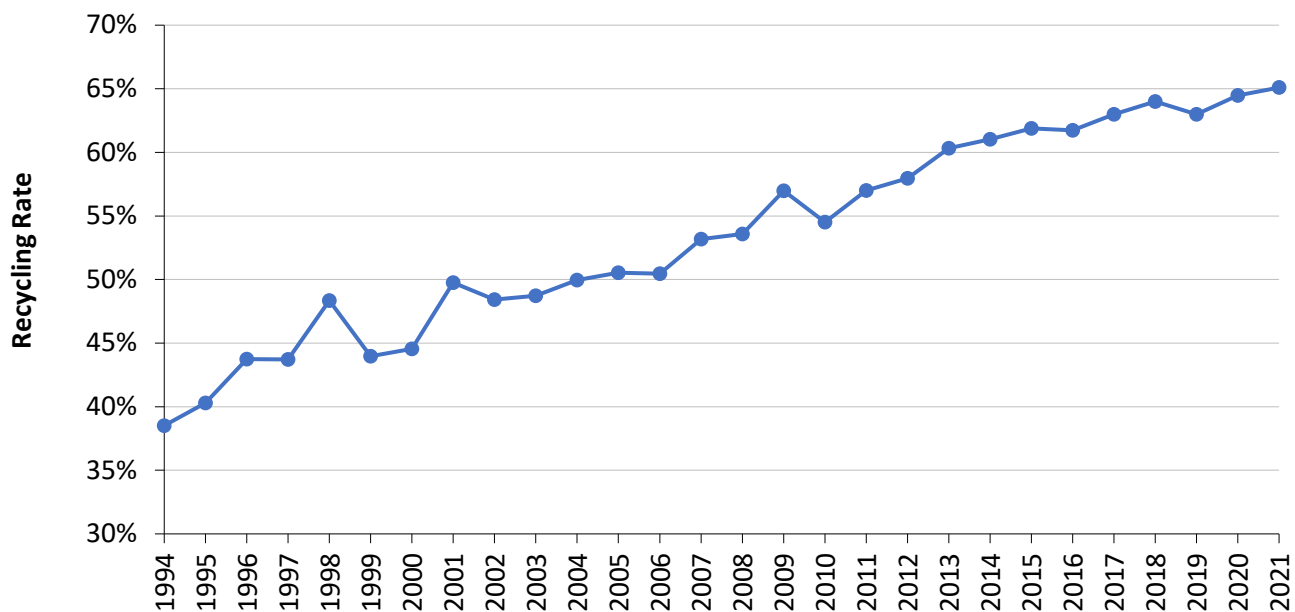


FIGURE 4: TOTAL WASTE GENERATION, DISPOSAL AND RECYCLING RATES PER CAPITA

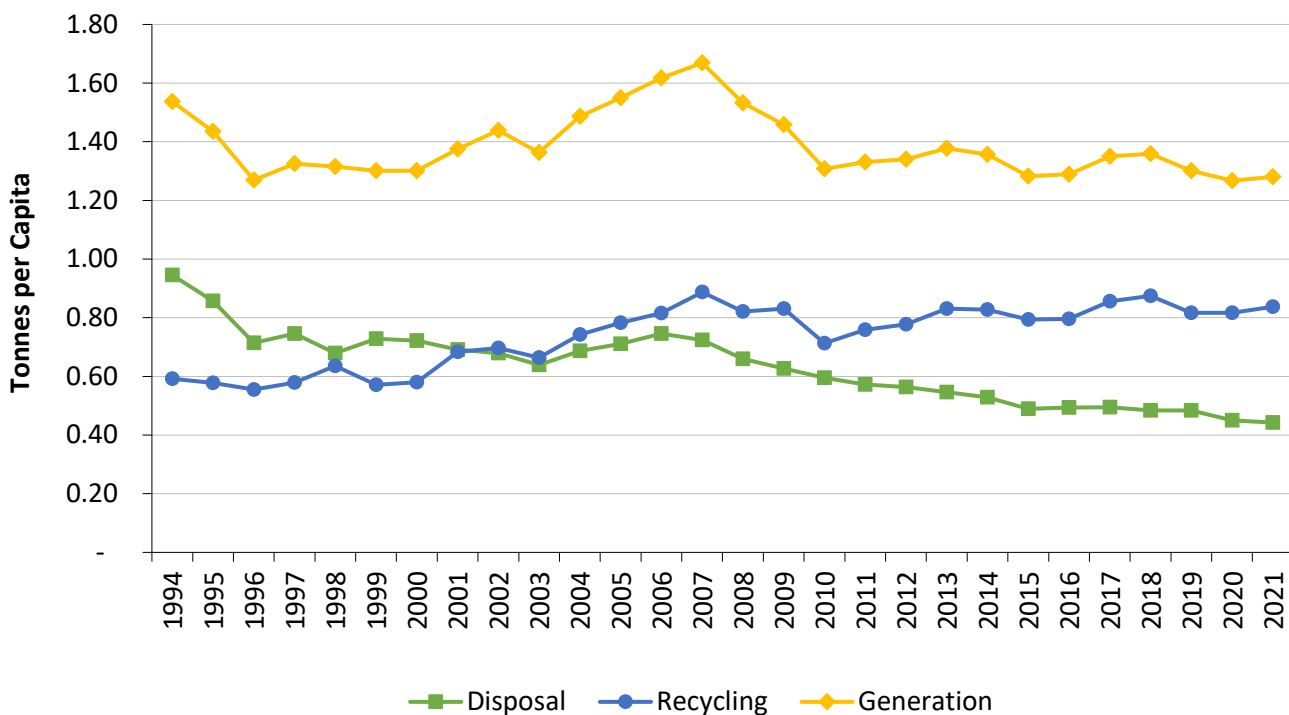


Table 6: Metro Vancouver Regional Solid Waste and Recycling Figures

YEAR	REGIONAL POPULATION	REGIONAL HOUSEHOLDS	TOTAL GENERATED (tonnes)	TOTAL RECYCLED (tonnes)	TOTAL DISPOSED (tonnes)	RECYCLING RATE (%)	GENERATION RATE (tonnes/capita)	DISPOSAL RATE (tonnes/capita)	DISPOSAL RATE (tonnes/household)
1994	1,732,567		2,663,581	1,025,921	1,680,750	39%	1.54	0.97	
1995	1,784,656		2,561,858	1,032,095	1,529,763	40%	1.44	0.86	
1996	1,906,492		2,419,323	1,058,441	1,360,882	44%	1.27	0.71	
1997	1,954,523		2,589,044	1,131,958	1,457,086	44%	1.32	0.75	
1998	1,984,743		2,609,913	1,261,680	1,348,233	48%	1.31	0.68	
1999	2,013,201		2,618,538	1,151,130	1,467,408	44%	1.30	0.73	
2000	2,041,399		2,657,076	1,183,611	1,473,465	45%	1.30	0.72	
2001	2,073,662		2,851,208	1,418,489	1,432,719	50%	1.37	0.69	
2002	2,102,244		2,903,894	1,470,445	1,433,449	51%	1.38	0.68	
2003	2,128,965		2,775,455	1,414,390	1,361,065	51%	1.30	0.64	
2004	2,153,998		3,072,702	1,595,999	1,476,703	52%	1.43	0.69	
2005	2,188,573		3,245,796	1,701,414	1,544,382	52%	1.48	0.71	
2006	2,218,026	817,040	3,434,617	1,794,613	1,640,004	52%	1.55	0.74	2.01
2007	2,251,887	831,909	3,598,142	1,980,751	1,617,391	55%	1.60	0.72	1.94
2008	2,273,095	836,304	3,366,123	1,866,892	1,499,231	55%	1.48	0.66	1.79
2009	2,314,163	865,017	3,374,840	1,922,840	1,452,001	57%	1.46	0.63	1.68
2010	2,351,496	879,874	3,075,392	1,676,117	1,399,275	55%	1.31	0.60	1.59
2011	2,395,520	898,273	3,188,348	1,817,446	1,370,902	57%	1.33	0.57	1.53
2012	2,408,559	909,994	3,228,305	1,871,339	1,356,966	58%	1.34	0.56	1.49
2013	2,430,305	920,375	3,348,498	2,020,114	1,328,384	60%	1.38	0.55	1.44
2014	2,465,031	939,212	3,343,471	2,040,280	1,303,191	61%	1.36	0.53	1.39
2015	2,497,052	943,072	3,202,979	1,982,137	1,220,842	62%	1.28	0.49	1.29
2016	2,546,595	943,072	3,295,830	2,039,569	1,256,261	62%	1.29	0.49	1.33
2017 ⁽¹⁾	2,610,929	984,640	3,525,224	2,234,055	1,291,169	63%	1.35	0.49	1.31
2018	2,648,493	998,930	3,599,801	2,317,050	1,282,752	64%	1.36	0.48	1.28
2019	2,681,878	1,019,526	3,490,425	2,191,421	1,299,005	63%	1.30	0.48	1.27
2020	2,766,953	1,075,454	3,506,352	2,261,038	1,245,314	64%	1.27	0.45	1.16
2021	2,807,469	1,096,151	3,607,018	2,351,848	1,242,493	65%	1.28	0.44	1.13

(1) 2017 demographics data previously published was updated in 2018 annual report to reflect new census information and projections based on the 2016 census results.

Table 7: Single-family Residential Solid Waste and Recycling Figures

YEAR	SINGLE FAMILY RESIDENTIAL POPULATION	SINGLE FAMILY RESIDENTIAL HOUSEHOLDS	SECTOR GENERATED (tonnes)	SECTOR RECYCLED (tonnes) ¹	SECTOR DISPOSED (tonnes)	SECTOR RECYCLING RATE (%)	SECTOR GENERATION RATE (tonnes/capita)	SECTOR DISPOSAL RATE (tonnes/capita)	SECTOR DISPOSAL RATE (tonnes/household)
2006	1,389,809	428,045	778,629	336,577	442,052	43%	0.56	0.32	1.03
2007	1,399,185	434,163	783,878	352,455	431,423	45%	0.56	0.31	0.99
2008	1,409,040	428,045	741,783	324,093	417,690	44%	0.53	0.30	0.98
2009	1,419,442	443,894	749,536	330,294	419,242	44%	0.53	0.30	0.94
2010	1,429,495	447,932	721,746	344,450	377,296	48%	0.50	0.26	0.84
2011	1,440,334	454,662	732,112	363,594	368,518	50%	0.51	0.26	0.81
2012	1,476,411	456,259	784,196	439,077	345,118	56%	0.53	0.23	0.76
2013	1,484,766	462,170	761,169	456,822	304,347	60%	0.51	0.20	0.66
2014	1,494,336	464,955	774,877	482,090	292,787	62%	0.52	0.20	0.63
2015	1,511,428	471,157	809,500	533,861	275,639	66%	0.54	0.18	0.59
2016	1,533,062	476,559	764,037	491,190	272,848	64%	0.50	0.18	0.57
2017 ⁽²⁾	1,535,480	472,530	748,410	477,832	270,578	64%	0.49	0.18	0.57
2018	1,557,308	476,600	704,462	447,639	256,824	64%	0.45	0.16	0.54
2019	1,571,441	481,304	694,246	439,730	254,516	63%	0.44	0.16	0.53
2020	1,634,477	504,527	754,903	485,419	269,485	64%	0.46	0.16	0.53
2021	1,656,892	508,764	722,722	455,723	266,999	63%	0.44	0.16	0.52

(1) Includes distributed EPR Recyclables from 2012 onward.

(2) 2017 demographics data previously published was updated in 2018 annual report to reflect new census information and projections based on the 2016 census results.

Acknowledgements

Metro Vancouver acknowledges the contributions of its member jurisdictions, EPR Product Stewardship Associations, and the many private recycling and processing facilities for the data used to complete this report.

METHODOLOGY AND SOURCES OF ERROR

Data Sources

Preparing Metro Vancouver's annual summary report is a months long process which incorporates information from various sources. **Table 8** below outlines the sources and their usage:

Table 8: Sources and Usage of Various Information

SOURCE	USAGE
Metro Vancouver Solid Waste Management Facility Scale Data	<ul style="list-style-type: none">• Disposal quantities• Recycling quantities• Distribution by sector
City of Vancouver Solid Waste Management Facility Scale Data	<ul style="list-style-type: none">• Disposal quantities• Distribution by sector
Licensed Private Facilities	<ul style="list-style-type: none">• Recycled material quantities• Construction and demolition disposal quantities
Unlicensed Private Facilities	<ul style="list-style-type: none">• Recycled material quantities
Extended Producer Responsibility Organization Reports	<ul style="list-style-type: none">• Recycled material quantities
Reuse and Repair Organizations (annual reports and financial statements)	<ul style="list-style-type: none">• Re-use quantities
Municipal Surveys	<ul style="list-style-type: none">• Distribution by sector

The data from each source varies in reliability and potential for error, with the measured Metro Vancouver-owned data (e.g. scale data) least likely to be subject to error. Third-party reported data (e.g. unlicensed private facilities) provided to Metro Vancouver for the purpose of annual reporting is assumed accurate, but may include

inaccuracies. **Figure 5** below indicates the relative proportion of each type of data, with darker shades indicating sources with more detailed data available to Metro Vancouver.

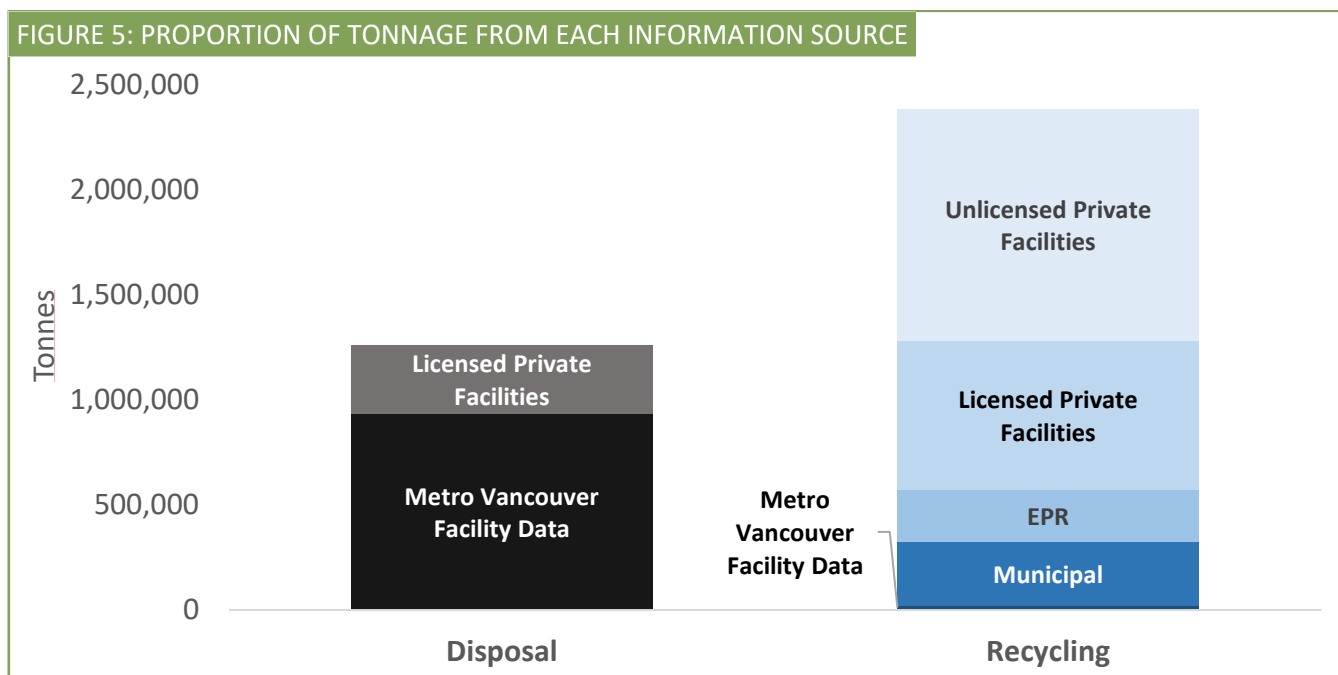


Table 9 below shows the guidelines used when determining what types of materials and which material management methods are counted as recycling vs. disposal.

Table 9: Assigned Categories for Facilities and Material Types

FACILITY OR MATERIAL TYPE	CATEGORIZATION
Waste-to-Energy Facility	Counted as disposal except for metals recovered for recycling
EPR Materials	Residuals counted as disposed where reported by producer responsibility organizations
Composting Facilities	Inbound organics minus residuals disposed counted as recycling for facilities within Metro Vancouver
Material Recovery Facilities	Residuals counted as disposed, outbound materials sent for processing counted as recycling, including biomass and plastics used as fuel
Processing Facilities	Accounted for as outputs from above, residuals counted as disposed for facilities within Metro Vancouver

Calculation

Total Disposal

To calculate the tonnage of garbage disposed in the region, Metro Vancouver relies on waste tonnages from regional facilities including all operating recycling and waste centres, the Waste-to-Energy Facility, the Vancouver South Transfer Station, and the Vancouver Landfill. Disposal at private licensed construction and demolition facilities are added to this total, including an estimate of any construction and demolition material disposed out of region. Metro Vancouver annually estimates whether a significant tonnage of residential and commercial garbage is leaving the region, and that is added when suspected. In 2021, no significant tonnage of residential and commercial garbage was suspected to be leaving the regional system.

Disposal By Sector

Metro Vancouver uses scale data to determine the tonnage of material that is municipal (hailed by, or on behalf of, a municipality or member jurisdiction), commercial (hailed by a commercial hauler not on behalf of a municipality or member jurisdiction), and small loads (customers without a scale system account bringing in less than 1 tonne of material). Municipal account data, reported by member jurisdictions, is used to allocate the municipal data between single-family and multi-family residential sectors. Multi-family waste generation estimates obtained from periodic multi-family waste composition studies are used to split the commercial tonnage between multi-family and commercial/institutional. Small loads are assumed to be 90% single-family residential, 5% multi-family residential and 5% commercial/institutional as determined from customer surveys.

All material disposed at private construction & demolition facilities, as well as the portion of Vancouver Landfill tonnage indicated as construction & demolition or demo garbage is counted as disposed for the construction & demolition sector.

Total Recycling

The total material recycled is calculated from Extended Producer Responsibility organization reports for materials that are managed under a provincially mandated program, and from licensed and unlicensed private facility tonnage summaries for materials that are not. Materials that are collected at recycling depots or by member jurisdictions are also added to the recycling total if they are not covered by an Extended Producer Responsibility program and do not typically go to licensed or unlicensed private facilities contracted by Metro Vancouver (e.g. scrap metals).

Recycling By Sector

Extended Producer Responsibility organization tonnage is split by organization depending on the type of material collected. For example, Recycle BC provides the approximate split of single-family vs. multi-family collection sites, which is applied to their overall tonnage. Most organizations with a drop-off model are estimated to encompass 90% residential to 10% commercial where source information is not provided. Depot tonnage is split 90% single-family, 5% multi-family and 5% commercial/institutional based on surveys completed at facilities. Private and unlicensed facility data is considered to be commercial/institutional or construction & demolition depending on

the material and facility type, with material originated from construction & demolition transfer stations assumed to originate from that sector, and material not covered by a residential EPR program assumed to be from the commercial/institutional sector unless otherwise indicated by municipal surveys or facility processing contracts.

Reuse

Reuse estimates are obtained using the methodology outlined in a 2018 reuse estimate report completed by Kelleher Environmental. Estimates typically involve obtaining representative metrics publicly available or by calling organizations, and applying factors which are then used to estimate total reuse. Reuse is not included in recycling tonnages and the overall recycling rate, and is instead considered separately. Reuse data is not presented by sector. This methodology is still relatively new and continues to be refined as better information sources become available.

Construction & Demolition

Much of the construction & demolition recycling tonnage reported comes from unlicensed private facilities. Metro Vancouver calls a list of known unlicensed facilities in the region to obtain tonnages and relies upon those tonnages for recycling data provided in this report. Metro Vancouver will only report an increase to a maximum of 50% of the prior year's tonnage unless provided with verifiable explanation.

Due to the relatively high weight and relative ease of recycling of concrete and asphalt, these materials tend to be present in higher quantities in the construction & demolition sector, contributing to a high recycling rate which may obscure some of the challenges that still exist in this sector, such as recycling wood. **Table 10** below shows the two calculated diversion rates to highlight the difference.

Table 10: Tonnage of C&D Materials and Associated Recycling Rates

MATERIAL	TONNES
Asphalt	295,300
Concrete	866,363
Fibre	35,928
Gypsum	63,533
Metal	12,416
Wood	160,391
Recycling Subtotal (Asphalt and Concrete)	1,161,663
Recycling Subtotal (Other Materials)	272,270

MATERIAL	TONNES
Recycling Total	1,433,933
Disposal	382,007
CONSTRUCTION AND DEMOLITION RECYCLING RATE (Including Concrete and Asphalt)	79%
CONSTRUCTION & DEMOLITION RECYCLING RATE (Excluding Concrete and Asphalt)	42%

Recycling Rates

The recycling rate is calculated by (total recycling)/(total recycling + total disposal) for each sector and overall.

Assumptions

Assumptions are provided as footnotes to the tables in which the relevant data is reported.

APPENDIX 1 – METRO VANCOUVER RECYCLING AND SOLID WASTE QUANTITIES 2019, 2020 AND 2021

WASTE SECTOR		DISPOSED (tonnes)			RECYCLED (tonnes)			RECYCLING RATE (%) ⁽³⁾			
		2019	2020	2021	2019	2020	2021	2019	2020	2021	% change (2020-2021)
Residential	tonnes	488,218	509,038	510,337	571,961	631,627	601,509	54%	55%	54%	-1%
	tonnes/capita	0.18	0.18	0.18	0.21	0.23	0.21				
Single Family ⁽¹⁾	tonnes	254,516	269,485	266,999	439,730	485,419	455,723	63%	64%	63%	-1%
Multi-Family ⁽²⁾	tonnes	233,702	239,554	243,337	132,231	146,208	145,786	36%	38%	37%	-1%
Commercial/Institutional ⁽²⁾	tonnes	385,073	354,268	372,861	289,764	278,507	316,406	43%	44%	46%	2%
	tonnes/capita	0.14	0.13	0.13	0.11	0.10	0.11				
Construction & Demolition ⁽⁴⁾	tonnes	425,713	382,007	359,296	1,329,696	1,350,904	1,433,933	76%	78%	79%	1%
Total	tonnes	1,299,005	1,245,314	1,242,493	2,191,421	2,261,038	2,351,848	63%	64%	65%	1%
	tonnes/capita	0.48	0.45	0.44	0.82	0.82	0.84				
	tonnes/ household	1.27	1.16	1.15	2.15	2.10	2.15				

Year	Single Family		Multi Family		Total	
	Population	Households	Population	Households	Population	Households
2019	1,571,441	481,304	1,110,438	538,222	2,681,878	1,019,526
2020	1,634,477	504,527	1,132,476	570,927	2,766,953	1,075,454
2021	1,656,892	508,764	1,150,577	587,386	2,807,469	1,096,151

- (1) Reported tonnes of disposed and recycled waste are obtained from municipal reports, private recycling and processing facility records, landfill records, or product stewardship association records. This includes residential drop-off tonnages.*
- (2) Estimated tonnes of disposed waste are based on per capita multi-family disposal rates and the total recycling and waste centre weigh scale reports for commercial waste, which includes multi-family and commercial/institutional tonnages. A calculated portion of that total is then attributed to each sector. Multi-family recycling is reported by member jurisdictions and combined with estimated residential drop-off tonnages.*
- (3) The total recycling rate includes the EPR tonnages. The recycling rates for individual sectors also include EPR tonnages, based on estimates of the relative contributions to EPR tonnages from single-family homes (54%), multi-family homes (36%), and businesses (10%) with the exception of Recycle BC tonnages that are allocated 60% to the single-family sector and 40% to the multi-family sector.*
- (4) Reported tonnes of recyclable materials and disposed waste are obtained from private licensed brokers, composters and transfer stations, and from unlicensed recycling facilities.*

APPENDIX 2 – METRO VANCOUVER SOLID WASTE SYSTEM 2021

metrovanancouver | SOLID WASTE



2021 Metro Vancouver Solid Waste System

System Description

Metro Vancouver is responsible for waste reduction, recycling planning, and the operation of a series of solid waste facilities in the region. Planning for less waste, improving reuse and recycling systems and managing the remaining waste reflects the public's expectations of high environmental stewardship, as well as the desire to keep waste management affordable.

Metro Vancouver operates six recycling and waste centres where residents and businesses drop off garbage, yard trimmings and a variety of other recyclable materials. The new United Boulevard and Central Surrey recycling and waste centres opened in 2022. Planning is currently underway to develop full scale recycling depots at the North Surrey and Langley recycling and waste centres.

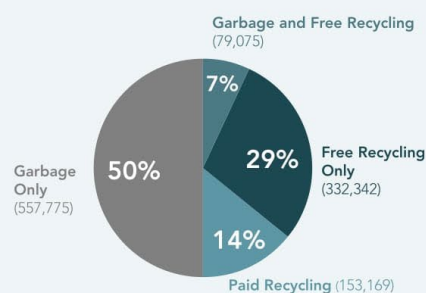
In addition to the Metro Vancouver facilities, Burnaby, Richmond, Coquitlam, Bowen Island and the Ridge Meadows Recycling Society (in partnership with Maple Ridge) operate their own recycling depots funded in part by Metro Vancouver. Recycling information from those facilities is included as part of the regional solid waste recycling statistics, but not included as part of this summary of Metro Vancouver solid waste facility data. The Vancouver Landfill, Vancouver South Transfer Station and Zero Waste Centre are owned and operated by the City of Vancouver.

Garbage remaining after recycling is managed at the Metro Vancouver Waste-to-Energy Facility and the Vancouver Landfill. Garbage in excess of what can be managed at these local facilities is sent to remote landfills for disposal.

Metro Vancouver Facilities

MATERIAL(S)	CUSTOMERS	TONNES
Garbage	636,850	670,626
Clean Wood, Organics & Other Paid Recycling	137,299	50,903
Gypsum	15,870	2,194
Mattresses	78,202 units	2,113
Free Recycling	411,417	10,100

2021 Overall Customer Use of Solid Waste Facilities



* Regional garbage received at Metro Vancouver and City of Vancouver facilities (from residential and commercial/institutional sources) totaled 976,229 tonnes in 2021. In addition, the Waste-to-Energy Facility received 10,500 tonnes of utility residuals and international waste and the Vancouver Landfill received 29,635 tonnes of construction & demolition waste and 21,151 tonnes of utility residuals and 35,326 tonnes of bottom ash.

All figures are based on 2021 data.



30 Riverside Drive, North Vancouver

North Shore

Recycling and Waste Centre

Facility Description

The North Shore Recycling and Waste Centre accepts garbage and a wide range of recyclables from both small and large vehicles. It has both attended and automated scales, the latter for use mainly by account customers with mechanically unloaded vehicles. Garbage is unloaded onto a tipping floor in the main building and a front end loader pushes the waste into an underground compactor for shipment to disposal. Yard trimmings, clean wood, gypsum and mattresses are accepted for recycling for a fee. A recycling depot where customers can drop off materials for free is located ahead of the scales. Accepted materials include batteries, electronics, cardboard, metal, expanded polystyrene, plastic containers and bags, light fixtures, cooking oil, books and textiles.

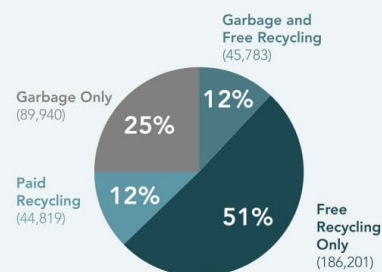
Site Area: 1.78 hectares (4.4 acres)
including green waste yard

Building Area: 51 m x 61 m = 3,100 m²

Number of customers in 2021: 366,743

MATERIAL(S)	CUSTOMERS	TONNES
Garbage	135,723	111,449
Clean Wood & Organics	41,273	34,119
Gypsum	3,546	433
Mattresses	19,040 units	525
Free Recycling	231,984	4,738

2021 Overall Customer Use of North Shore Recycling and Waste Centre



All figures are based on 2021 data.



1200 United Boulevard, Coquitlam

Coquitlam

Recycling and Waste Centre

Facility Description

The Coquitlam Recycling and Waste Centre closed in March 2022 and was replaced by the new United Boulevard Recycling and Waste Centre. It accepted garbage and a wide range of recyclables from both small and large vehicles. It had both attended and automated scales, the latter for use mainly by account customers with mechanically unloaded vehicles. Garbage was unloaded onto a tipping floor in the main building and a front end loader pushed the waste into an underground compactor for shipment to disposal. Yard trimmings, clean wood, gypsum and mattresses were accepted for recycling for a fee. A recycling depot where customers could drop off materials for free was located ahead of the scales. Accepted materials included batteries, electronics, cardboard, metal, expanded polystyrene, glass packaging, light fixtures, cooking oil, books and thermostats.

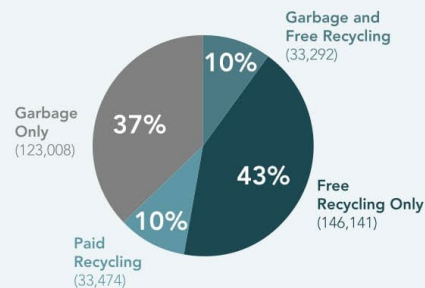
Site Area: 2.681 hectares (6.625 acres)

Building Area: 50 m x 78 m = 3,900 m²

Number of customers in 2021: 335,915

MATERIAL(S)	CUSTOMERS	TONNES
Garbage	156,300	199,220
Clean Wood & Organics	29,281	6,441
Gypsum	4,193	473
Mattresses	25,015 units	668
Free Recycling	179,432	5,361

2021 Overall Customer Use of Coquitlam Recycling and Waste Centre



All figures are based on 2021 data.



9770 192nd Street, Surrey

North Surrey Recycling and Waste Centre

Facility Description

The North Surrey Recycling and Waste Centre accepts garbage and a limited number of recyclables from both small and large vehicles. It has both attended and automated scales, the latter for use mainly by account customers with mechanically unloaded vehicles. Garbage is unloaded into a pit for mechanical unloading vehicles and onto the tipping floor for small vehicles. A front end loader pushes the waste into an underground compactor for shipment to disposal. Yard trimmings, clean wood, gypsum and mattresses are accepted for recycling for a fee. General recyclables such as metals are managed within the transfer building. Customers have the option to pay for recyclables with their garbage, or weigh in and out for free drop off of their recyclables.

Site Area: 2 hectares (5 acres)

Building Area: 60 m x 88 m = 5,400 m²

Number of customers in 2021: 203,647

MATERIAL(S)	CUSTOMERS	TONNES
Garbage	165,674	221,129
Clean Wood, Organics & Other Paid Recycling	34,227	4,604
Gypsum	3,746	574
Mattresses	19,593 units	494

All figures are based on 2021 data.



1070 – 272nd Street, Langley Township

Langley Recycling and Waste Centre

Facility Description

The Langley Recycling and Waste Centre accepts garbage and limited recyclables from customers in small vehicles. It has attended scales only, and is not used by mechanically unloading trucks. Garbage is hand-unloaded by customers onto a walking floor that is then loaded into a compactor container. Recyclables accepted for a fee include yard trimmings, clean wood, gypsum and mattresses. Other recyclables such as batteries, cardboard, metals, plastic bags and containers, refillable propane tanks and oil filters, are accepted within the transfer building area. Customers have the option to pay for recyclables with their garbage, or weigh in and out for free drop off of their recyclables.

Site Area: 3.86 hectares (9.5 acres)

Building Area: 1,672 m²

Number of customers in 2021: 72,576

MATERIAL(S)	CUSTOMERS	TONNES
Garbage	57,067	8,233
Clean Wood, Organics & Other Paid Recycling	13,378	2,708
Gypsum	2,131	376
Mattresses	5,918 units	169

All figures are based on 2021 data.



10092 – 236th Street, Maple Ridge

Maple Ridge Recycling and Waste Centre

Facility Description

The Maple Ridge Recycling and Waste Centre accepts garbage and a number of recyclables from small vehicles that are hand-unloaded. It has attended scales only, and is not used by mechanically unloading trucks. Garbage is unloaded directly into trailers located below the tipping floor. Yard trimmings, clean wood, new and used gypsum and mattresses are accepted for recycling for a fee.

A part of the property where the recycling and waste centre is located also contains a recycling depot which is leased to Maple Ridge who in turn sublease to the Ridge Meadows Recycling Society. The Ridge Meadows Recycling Society operate the recycling depot and it accepts recyclable materials for free.

Site Area – recycling and waste centre:

1.887 hectares (4.66 acres)

Site Area – recycling depot: 0.543 hectares (1.34 acres)

Number of customers in 2021: 115,824

MATERIAL(S)	CUSTOMERS	TONNES
Garbage	94,430	10,385
Clean Wood & Organics	19,140	3,030
Gypsum	2,254	337
Mattresses	8,636 units	256

All figures are based on 2021 data.



5150 Riverbend Drive, Burnaby

Waste-to-Energy Facility

Facility Description

Metro Vancouver's Waste-to-Energy Facility has operated in Burnaby since 1988 and handles about 250,000 tonnes of garbage per year – roughly a quarter of the region's garbage. It is a mass-burn facility that turns waste into electricity (enough to power 16,000 homes) and recovers approximately 5,000 tonnes of ferrous and 250 tonnes of non-ferrous metal annually.

Metro Vancouver has an agreement with River District Energy to provide heat and hot water through a new district energy system. When fully built out, the district energy system will provide heat and hot water to over 30,000 residential units in Burnaby and Vancouver, reducing greenhouse gas emissions by up to 45,000 tonnes CO₂eq.

The waste-to-energy process is monitored 24 hours a day, seven days a week, 365 days a year from a control room located on site. Facility emissions data and compliance reports are available on Metro Vancouver's website in real time. The range of emissions monitored, includes common air contaminants such as nitrogen oxides and particulate matter, as well as acid gases, trace metals, trace organics, and dioxins / furans.

The facility receives waste from an average of 80 mechanically unloading trucks per day that empty their loads into a large garbage bunker.

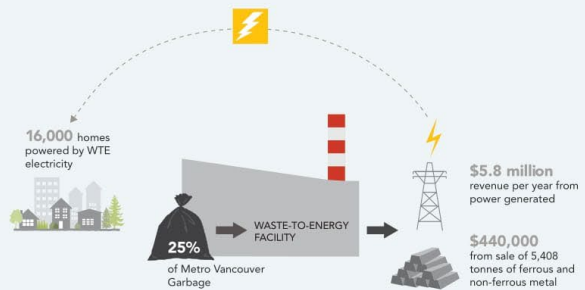
Site Area: 1.8 hectares (4.4 acres)

Building Area: 70 m x 70 m = 4,900 m²

Direct Haul: 130,709 tonnes

Transfer: 110,771 tonnes

Total Processed (2021): 241,480 tonnes



All figures are based on 2021 data.