

British Columbia's Solid Waste Flow, 2006 Summary Report

Prepared for the Ministry of Environment
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BCStats



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INTRODUCTION

This report contains a summary of British Columbia's solid waste¹ flow patterns observed in 2006. Three key sectors are measured: industrial, commercial and institutional (IC&I); construction, renovation and demolition (CR&D); and residential. BC is comprised of 29 regional districts (RDs), each of which are responsible for managing waste residuals and tracking waste statistics and composition at landfills within their respective regions. Data for this summary report is measured through use of individual regional waste management reports, coupled with data from Statistics Canada's Waste Management Industry Survey (WMIS), and numerous other provincial reports, such as those produced to measure product stewardship and diversion programs. Direct analysis of solid waste offers important information about the composition of waste produced by all sources and the information is an invaluable tool for waste management planning purposes. The province and its regional districts are responsible for managing solid waste within their boundaries and rely on solid waste composition studies to provide information about the various waste streams and to assist with the development of waste reduction strategies.

Before examining the overall picture of solid waste flow in British Columbia, it is important to provide a brief summary of the key terminology surrounding waste management, the sources and methods used to develop estimates and identify some of the difficulties with data describing this industry.

METHODOLOGY

Wherever possible, specific local waste characterization data was used to develop estimates in this report. Data provided from Statistics Canada for disposal tonnage is paired with waste characterization data from regional landfill audits and regional demographic statistics to develop projections for each of the three aforementioned sectors (residential, IC&I and CR&D) sectors. A multitude of resources including documents and individuals were used in the development of waste flow estimates for BC. Key sources of data for this project include:

- Natural Resources Canada's report, The Government of Canada Action Plan 2000 on Climate Change, as well as substantial methodological advice provided by its author, Robert Sinclair.
- Statistics Canada's annual Waste Management Industry Survey Results – Business and Government Sectors and various individuals within Statistics Canada.

¹ For the purpose of this report, "waste" is understood as a non-hazardous material that is unwanted by its producer. The unwanted materials may be by-products of a production process or, alternatively, they might be products, the inherent value of which has been consumed from the perspective of the current holder.

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- Waste management industry reports from multiple BC municipalities for the years closest to the reporting year (2006). The latest year available for the Greater Vancouver Regional District (GVRD) waste audit report in which the required sectoral splits are provided is 2004.² Similarly, for the Capital Region District (CRD), the most recent applicable report with the required breakdown of residential, IC&I and CR&D is 2004/05.³
 - Waste management industry and stewardship agencies – publications and/or personal contacts.

The estimation process for values that are unavailable from these sources is based on the following formula: $\text{Generation} = \text{Disposal} / (1 - \text{Diversion Rate})$. Diversion rates (tonnes diverted or recycled divided by total amount of material generated) for BC and the three sectors are not provided by WMIS and have been estimated using shares from data provided in past iterations of the survey. It should also be noted that the numbers provided from the WMIS are themselves rounded, and therefore the aforementioned formula is by no means exact. Disposal rates are required for this formula and, where missing from WMIS, are gathered from other sources or estimated.

There are several limitations to both the data available as well as the data compiled for the purposes of this report.⁴ Readers are strongly advised to use caution with any of the estimated values provided in this report, and that rounding is recommended as the data is not as precise as it may appear. More detailed information is provided later for specific sectors; however, some of the most notable impediments to producing reliable provincial data for waste management as a whole include the following:

- Although each region tracks their waste statistics to the best of their ability, differences in the methods and frequency of data gathering posed challenges in obtaining up-to-date data;
- BC's RDs are diverse and differ significantly across the board in facets such as population density, industrial capacity and geographical topography and as such it is difficult to make assumptions for regions that have no available waste management data;
- Of the regions that do have relatively recent data for municipal solid waste, few have a breakdown by sector and fewer still have sectoral splits by type of material and rate of disposal;

² Greater Vancouver Regional District Solid Waste Management, 2004 Report.

³ Capital Regional District Solid Waste Stream Composition Study, 2004-05.

⁴ For a more detailed outline of data limitations, see the Natural Resource Canada report by Robert Sinclair: An Analysis of Resource Recovery Opportunities in Canada and the Projection of Greenhouse Gas Emission Implications. March, 2006.

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- Generation⁵, disposal and recycling⁶ data provided in Statistics Canada's WMIS is often inconsistent with locally-produced data. Given the variability of waste materials, although they are a critical component of this report, auditing solid waste streams for the purpose of characterization is riddled with risk. The potential for sampling and measurement errors is high, partly because municipalities usually find it more feasible and cost-effective to conduct waste audit "snap shots." These provide results that are merely *indicative* of waste flow patterns and are not to be considered concretely representative.
 - The differences in the terminology that the various respondents use can create many operational difficulties when surveys are in the field, as well as when results are being compared.
 - Each sector is affected differently by some of the methodological difficulties present in the data sources.

Key Sectors

Residential

Residential non-hazardous waste is solid waste produced by all residences and includes waste that is picked up by the municipality (either using its own staff or through contracting firms), and waste from residential sources that is self-hauled to depots, transfer stations and disposal facilities.

There are some RDs within British Columbia that have produced relatively recent reports containing waste characterization data. The Greater Vancouver RD, Capital RD and Fraser Valley RD, along with one landfill in the Central Okanagan RD were used to determine distribution of waste sources for those regions, respectively. In terms of residential waste composition, two studies were deemed most appropriate to select as baselines for less documented regions of the province. The Capital Regional District (CRD) was used to estimate waste composition data for "urban" regions, while a composition breakdown for a landfill in the Central Okanagan District (Kelowna's Glenmore landfill) was used to establish material composition for "rural" areas.⁷

In the residential component, twelve waste material categories are used to best reveal the types of materials being disposed of in the province's landfills. The regional reports provide many categories, but for the purpose of clarity and comparability, the broader categories are used in the text, tables and charts.

⁵ Total generation is the sum of total non-hazardous residential and non-residential solid waste disposed of in an off-site disposal facility and the total materials processed for recycling at an off-site recycling facility.

⁶ Recycling is the process whereby a material (for example, glass, metal, plastic, paper) is diverted from the waste stream and remanufactured into a new product or is used as a raw material substitute.

⁷ For the purpose of this report, RDs with populations over 100,000 were deemed as "urban" in nature, whereas those with fewer than 100,000 residents were classified as "rural."

Industrial, Commercial and Institutional

IC&I non-hazardous wastes include: industrial materials, which are generated by manufacturing, and primary and secondary industries, and are managed off-site from the manufacturing operation; commercial materials, which are generated by commercial operations, such as shopping centres, restaurants, offices and others; and institutional materials that are generated by institutional facilities, such as schools, hospitals, government facilities, seniors homes, universities, and others.

Characterization data for this sector has proven quite problematic in the past, but is gradually becoming more reliable. The problems that remain in the forefront are mostly surrounding the definition of IC&I itself. Since large industrial facilities often manage their own waste, it is likely that at least some truly “industrial” waste is not included in municipal reports of IC&I residual materials.

As in the case of the residential sector, the Capital Regional District (CRD) was used to estimate waste composition data for “urban” regions, while a composition breakdown for a landfill in the Central Okanagan District (Kelowna’s Glenmore landfill) was used to establish material composition for “rural” areas.

To allow for comparison between sectors, the same twelve waste material categories are used as in the residential component, to better reveal the types of materials being disposed of in BC’s landfills.

Construction, Renovation & Demolition

CR&D non-hazardous wastes, also referred to as DLC (demolition, land clearing and construction) refer to wastes generated by construction, renovation and demolition activities. It generally includes materials such as wood, drywall, certain metals, cardboard, doors, windows, wiring and others. It excludes materials from land clearing on areas not previously developed as well as materials that include asphalt, concrete, bricks and clean sand or gravel.⁸

Waste characterization data for the CR&D sector in British Columbia is very scarce and the most problematic of the three main sectors. Such types of waste come from both residential and non-residential sources. Most regions do not distinguish between these different sources of construction, renovation and demolition waste and even fewer provide a break-down by material. As such, it is very difficult to estimate this sector’s waste components.

Another difficulty lies in the fact that CR&D waste variability is very high. Factors such as seasonality, economic environment, accessibility to recycling facilities, the fluctuation of tipping fees, large construction projects, and regional trends in building preference

⁸ The definitions for the sectoral splits between sources of solid waste are as defined by Statistics Canada – Catalogue no. 16F0023X 39 Waste Management Industry Survey: Business and Government Sectors – 2006

are all highly volatile and tend to influence this type of waste production more than for the residential and IC&I sectors.

One way to estimate the possible split between residential and non-residential building waste is to look at trends in building permits issued in the province. This, paired with the use of a study conducted on the waste generation and characterization of the CR&D sector in Alberta, allows us to make some general assumptions for this sector in British Columbia as a whole. To date, the Albertan study⁹ is the most recent and most thorough Canadian report on waste stream for the CR&D sector. Using the specific percentages developed for Alberta, average values have been calculated for BC. Estimates of the total tonnage and percentage breakdown of materials of CR&D waste in BC have been created by: using the building permit residential/non-residential shares and applying them to overall disposal tonnage for CR&D in BC as provided by Statistics Canada; dividing the residential and non-residential activities into the three separate components of the CR&D sector (construction, renovation and demolition) through the application of the shares from the Alberta report; applying waste characterization data to eight broad material categories; and finally, summarizing the tonnage for each material category to arrive at an overall estimate and breakdown by material for the residential and non-residential components combined. There is no urban/rural split for this sector.

Key Components

Population

Population data for British Columbia as a whole in 2006 as well as for its 29 Regional Districts (RDs) was obtained from BC Stats, Population and Demographics section. Not surprisingly, the Greater Vancouver Regional District comprises much of the province's total population, followed by the Capital and Fraser Valley Districts. It can be assumed, then, that these three districts have the largest impact on the province's overall waste management activities. As previously noted, RDs with populations over 100,000 were deemed as "urban" in nature, whereas those with fewer than 100,000 residents were classified as "rural." By this measure, the urban population comprises 77% of the provincial total, while the rural areas are home to the remaining 23% of BC residents. The populations for BC's RDs in order from largest to smallest in 2006 are shown in Table 1.

⁹ Construction, Renovation and Demolition (CRD) Waste Characterization Study. Prepared for: Alberta Construction, Renovation and Demolition Waste advisory Committee. December, 2000.

Table 1: BC Population by Regional District, 2006

Regional District	Population
Greater Vancouver	2,199,121
Capital	355,871
Fraser Valley	266,725
Central Okanagan	167,417
Nanaimo	141,246
Thompson-Nicola	125,648
Fraser-Fort George	94,415
Okanagan-Similkameen	80,351
North Okanagan	78,877
Cowichan Valley	78,471
Cariboo	63,217
Comox Valley	60,396
Peace River	59,329
Central Kootenay	56,484
East Kootenay	56,096
Columbia-Shuswap	50,725
Strathcona	42,732
Bulkley-Nechacko	38,866
Kitimat-Stikine	38,803
Squamish-Lillooet	36,627
Alberni-Clayoquot	31,077
Kootenay-Boundary	30,826
Sunshine Coast	27,959
Skeena-Queen Charlotte	19,980
Powell River	19,711
Mount Waddington	11,962
Northern Rockies	6,298
Central Coast	3,220
Stikine	1,130

Source: BC Stats

Generation

Total waste generation is the sum of total non-hazardous residential and non-residential solid waste disposed of in an off-site disposal facility and the total materials processed for recycling at an off-site recycling facility.

Although municipalities are asked to report estimates of disposal and disposal rates, they rarely provide overall waste generation data. As a result, the generation data provided in this report are achieved through use of Statistics Canada's 2002 and 2006 Waste Management Industry Surveys using their estimates of overall disposal and diversion rates for British Columbia as a whole. Per capita disposal, generation and diversion rates undoubtedly vary from region to region. Numbers may also differ slightly from those reported in the WMIS, usually as the result of updates in population estimates since the time of the initial 2006 report.¹⁰ Table 2 shows an estimated breakdown of waste by sector in BC in 2006:

Table 2: BC's Estimated Solid Waste Flow by Sector, 2006 (tonnes)

Sector	Generation	Disposal	Recycling
Residential	1,383,369	956,968	426,401
IC&I	2,034,674	1,417,218	617,456
CR&D	661,717	542,894	118,823
Total estimated tonnes	4,079,760	2,917,080	1,162,680

Source: BC Stats and Statistics Canada

Disposal

Disposal refers to the process of discarding an unwanted material into the waste stream. Disposal is essentially comprised of what is left over from total waste generation after some of it has been recycled, or otherwise diverted from a landfill. It consists of waste that has been generated and that has not been recycled.¹¹

Disposal rates and disposal tonnage is available both from Statistics Canada's WMIS, as well as from various municipal reports. For the purposes of this report, disposal rates and tonnage of disposal for British Columbia's regions were estimated using the most

¹⁰ For further discussion of generation rates and the differences between Statistics Canada's Waste Management Industry Survey data and individual municipal solid waste reports, see Natural Resources Canada's 2006 report by Robert Sinclair: An Analysis of Resource Recovery Opportunities in Canada and the Projection of Greenhouse Gas Emission Implications. March, 2006.

¹¹ Total waste disposed is the amount of non-hazardous waste disposed of in public and private waste disposal facilities. This includes waste that is exported out of the source province or out of the country for disposal. This does not include wastes disposed in hazardous waste disposal facilities or wastes managed by the waste generator on site.

accurate population data from BC Stats, per capita disposal rates and estimated tonnage disposed by sector from the 2006 Waste Management Industry Survey.¹²

Diversion (Recycling and Product Stewardship)

Recycling is the process whereby a material (for example, glass, metal, plastic, paper) is diverted from the waste stream and remanufactured into a new product or is used as a raw material substitute.

Product stewardship is another form of diversion of waste from landfills. It refers specifically to the collection of materials for reuse or recycling that may offer some sort of incentive for the consumer. Many manufacturers now provide programs to their consumers to recycle or safely dispose of their products. In some cases, consumers pay environmental fees to recover the costs of these programs, and deposits as incentives to participate in the return programs. This term most frequently refers to the return of materials such as beverage containers, tires, paints, batteries, pesticides and motor oil.

Recycling rates and collection programs vary widely amongst regional districts, thus making it difficult to measure rates for the province as a whole.

Statistics Canada's data for waste diversion differs significantly from data provided from municipalities in BC. Part of this discrepancy may be attributable to the fact that the WMIS does not capture product stewardship data. Most municipalities in the province track product stewardship and recycling data together. Consequently, for the purposes of this report, product stewardship is treated as a separate component and adjustments have been made accordingly for the overall measurement of waste diversion in the province. Product stewardship data collected from various provincial sources¹³ has been added to the overall generation and recycling data for BC. It should be noted that some materials such as lead batteries, pharmaceuticals and oil also have special product stewardship programs, but are excluded in the formulas for waste diversion as they are classified as hazardous wastes. This report, the WMIS and all other municipal solid waste management reports do not include hazardous materials disposed in hazardous waste disposal facilities.¹⁴

¹² For detailed per-capita waste disposal rates in BC, see The BC Ministry of Environment's annual Municipal Solid Waste Tracking Reports: <http://www.env.gov.bc.ca/epd/epdpa/mpp/reduction.htm>

¹³ BC Product Stewardship programs for which adjustments have been made include: Beverage Container Deposit-Refund System for non-alcoholic beverage containers (Encorps Pacific Ltd.), Brewers Distributors Ltd. for beer, cider and coolers, Liquor Distribution Branch for wine, non-aluminum beer and liquor containers, and Financial Incentives for Recycling Scrap Tires (FIRST) for passenger car, light and medium truck tires. See the Ministry of Environment (<http://www.env.gov.bc.ca/epd/recycling/index.htm>) for more information and for summarized annual reports for BC's product stewardship programs.

¹⁴ This information covers only those companies and local waste management organizations that reported non-hazardous recyclable material preparation activities and refers only to that material entering the waste stream and does not cover any waste that may be managed on-site by a company or household. Additionally, these data do not include those materials transported by the generator directly to secondary processors such as pulp and paper mills while bypassing entirely any firm or local government involved in waste management activities.

SOME KEY RESULTS

As previously discussed, Statistics Canada's Waste Management Industry Survey (WMIS) and municipal audit reports are the source of the baseline disposal data for the projections in this report. However, wherever data are not available, estimates have been made so as to provide a more complete picture of solid waste flow and recycling in BC. The reader is again advised that figures presented in this report should be considered estimates only.

Source of disposal waste

Of the approximate 2,917,000 tonnes of waste disposed at British Columbian landfills in 2006, residential sources accounted for about a third (33%) of the waste. The industrial, commercial and institutional sector comprised nearly half (49%), while the remaining 19% of waste came from construction, renovation and demolition sources.

Residential composition

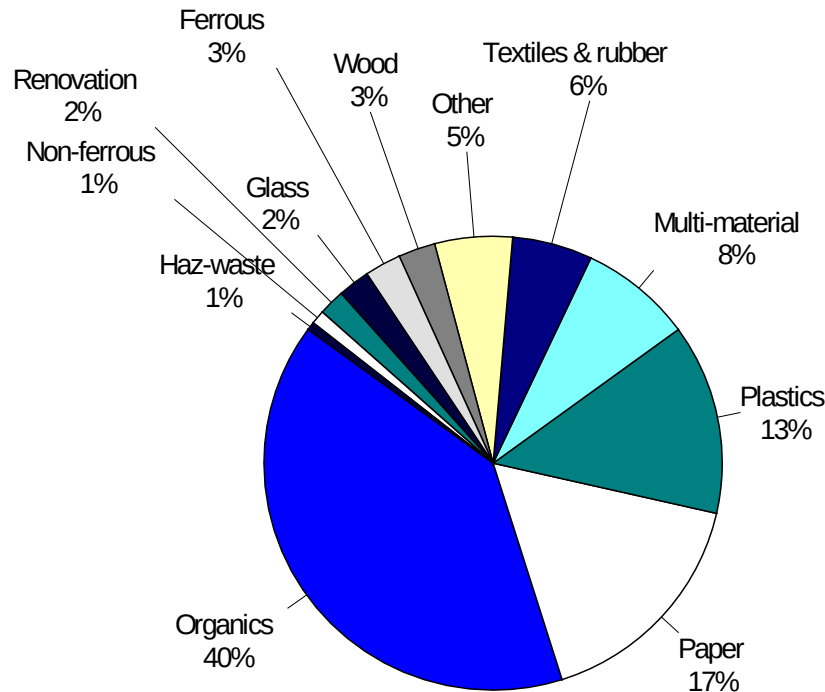
Encompassing nearly 40% of total residential waste disposed in the province, organic waste (food and other organic wastes) was the biggest player in BC's landfills in 2006. Averaging 17% of the total residential waste stream, the paper category represented the next highest share, followed by plastics (13%) and multi-material composites (8%). The remaining primary categories made up less than a quarter (approximately 22%) of the residential waste stream in 2006.

Table 3: Estimated Composition of BC Residential Waste Disposed, 2006

Material	Urban Tonnes	Rural Tonnes	Total Tonnage	Percent of Waste
Organics	277,837	102,262	380,100	39.7%
Paper	120,741	40,136	160,877	16.8%
Plastics	105,202	23,484	128,686	13.4%
Multi-material	57,248	20,282	77,529	8.1%
Textiles & rubber	43,137	10,034	53,171	5.6%
Other	46,444	4,270	50,713	5.3%
Wood	24,460	854	25,314	2.6%
Ferrous	19,925	4,804	24,729	2.6%
Glass	17,992	4,056	22,048	2.3%
Renovation	17,249	1,281	18,530	1.9%
Non-ferrous	7,524	1,814	9,338	1.0%
Haz-waste	5,719	213	5,932	0.6%
Total	743,477	213,491	956,968	100.0%

Source: BC Stats

Figure 1: Estimated Composition Shares of Residential Waste Disposed in BC, 2006



Source: BC Stats

Industrial, Commercial and Institutional Composition

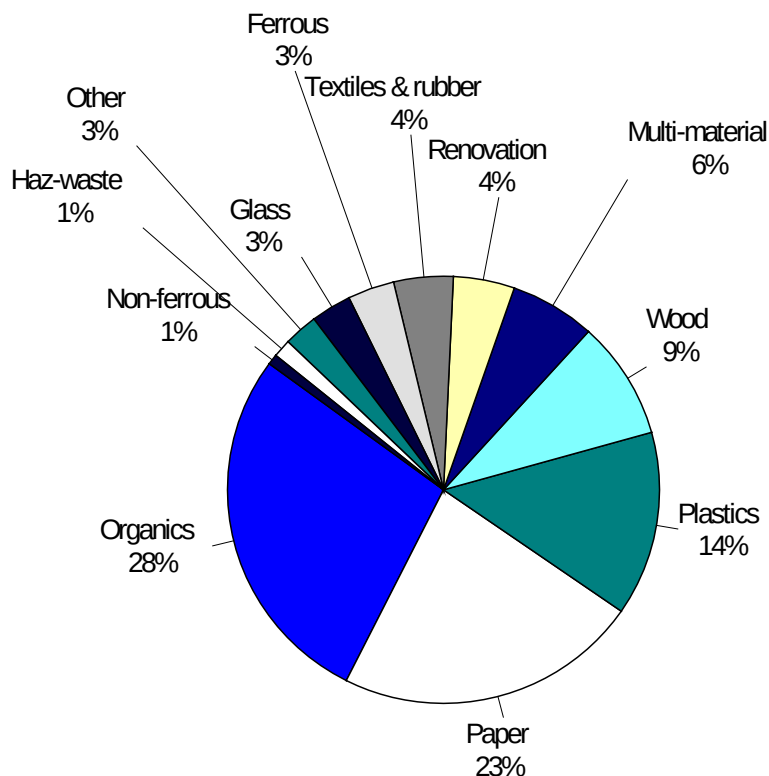
In general, waste from the residential and industrial, commercial and institutional sectors is relatively similar, with almost identical distributions in some of the primary waste categories. However, significantly more wood waste originates from the IC&I sector, while there is notably less organic waste, in particular food waste. In 2006, the top two material types represented half the overall weight of the waste stream from BC's IC&I sector. Organic matter (approximately 28%) contributed the greatest mass, followed closely by paper materials (an estimated 23%). Plastics (14%) and wood (9%) from IC&I sources were also in abundance in landfills, while other types of waste made less of an impact.

Table 4: Estimated Composition of BC IC&I Waste Disposed, 2006

Material	Urban Tonnes	Rural Tonnes	Total Tonnage	Percent of Waste
Organics	284,782	108,352	393,134	27.7%
Paper	189,532	133,821	323,352	22.8%
Plastics	164,670	31,401	196,071	13.8%
Wood	108,811	20,048	128,859	9.1%
Multi-material	90,407	1,261	91,669	6.5%
Renovation	64,361	0	64,361	4.5%
Textiles & rubber	56,504	3,887	60,391	4.3%
Ferrous	32,611	16,809	49,420	3.5%
Glass	20,234	23,593	43,827	3.1%
Other	35,644	34	35,678	2.6%
Haz-waste	18,923	511	19,434	1.4%
Non-ferrous	9,794	1,227	11,021	0.8%
Total	1,076,274	340,944	1,417,218	100.0%

Source: BC Stats

Figure 2: Estimated Composition Shares of IC&I Waste Disposed in BC, 2006



Source: BC Stats

Construction, Renovation and Demolition Composition

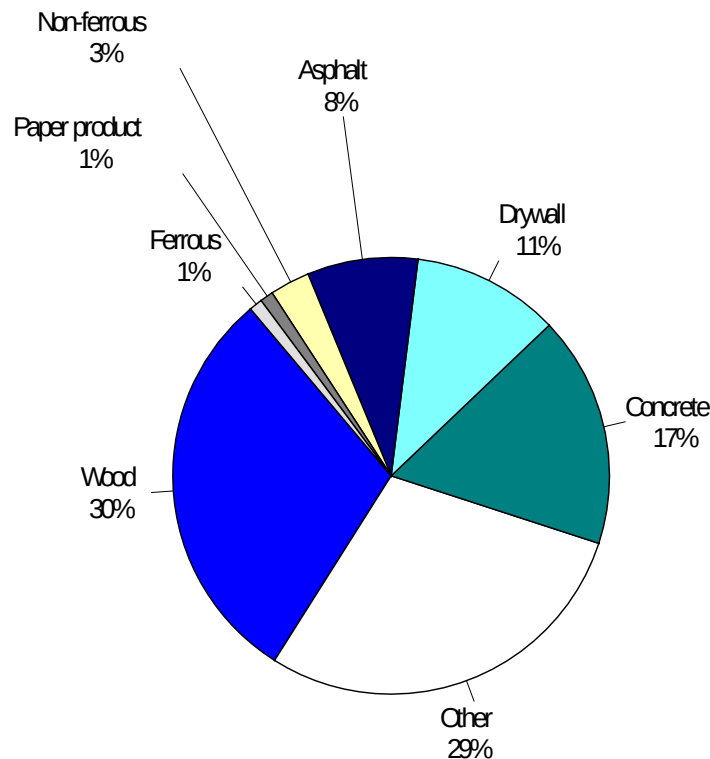
In general, the composition of material received from construction, renovation and demolition sources differs substantially from those generated from other sources. The bulk (an estimated 87%) of CR&D waste in 2006 came from wood, concrete, drywall and “other” types of waste (“other” waste refers to a mixture of unspecified materials). Combined, the remaining categories represented just over ten percent of the total waste stream.

Table 5: Estimated Composition of BC CR&D Waste Disposed, 2006

Material	Total Tonnage	Percent of Waste
Wood	164,444	30%
Other	159,314	29%
Concrete	92,195	17%
Drywall	58,532	11%
Asphalt	43,386	8%
Non-ferrous	14,175	3%
Paper product	6,613	1%
Ferrous	4,234	1%
Total	542,894	100%

Source: BC Stats

Figure 3: Estimated Composition Shares of CR&D Waste Disposed in BC, 2006



Source: BC Stats

Overall Composition from all Sources

Collectively, organics made up more than a quarter of the 2,917,000 tonnes in British Columbia's overall waste stream in 2006. This category is comprised primarily of compostable items such as food and yard waste. Paper, which includes newspapers and cardboard, and plastics, such as plastic bags and beverage containers, also accounted for substantial shares of waste disposed of in the province's landfills. Despite the noteworthy amount of recyclable and/or reusable materials that are still being disposed of, a substantial amount is being diverted through recycling and product stewardship programs. The overall diversion rate for all sectors combined in British Columbia is estimated to have been approximately 31% in 2006.

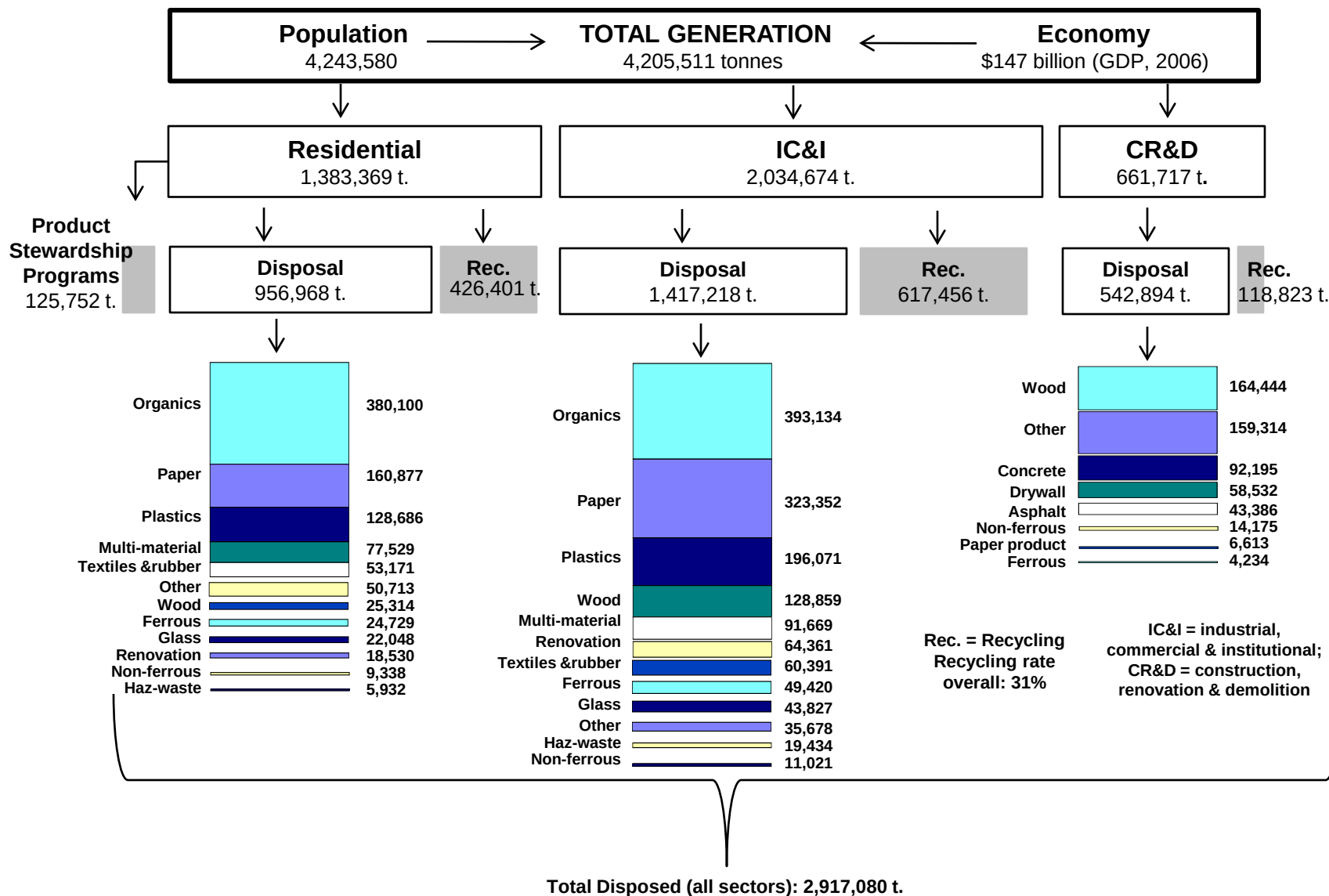
Table 6: Estimated Composition of Total BC Waste Disposed, 2006

Material	Total Tonnage	Percent of Waste
Organics	773,234	26.5%
Paper	490,843	16.8%
Plastics	324,757	11.1%
Wood	318,617	10.9%
Other	245,705	8.4%
Renovation	277,005	9.5%
Textiles & rubber	113,562	3.9%
Multi-material	169,198	5.8%
Ferrous	78,383	2.7%
Glass	65,876	2.3%
Non-ferrous	34,535	1.2%
Haz-waste	25,367	0.9%
Total	2,917,080	100.0%

Source: BC Stats

Figure 4 illustrates the breakdown of the waste generated, disposed of and recycled in the province in 2006 for each of the three sectors. Also included are visual representations of the estimated distribution of material disposed and the amount of material recovered through product stewardship programs.

Figure 4: Solid Waste Flow in BC, 2006



Snapshot: Hazardous Waste

There are many stewardship programs in place in the province aimed at minimizing the disposal of hazardous wastes in landfills. Despite consisting of less than one percent of BC's overall waste disposed in 2006, one should consider that this adds up to an estimated 25,367 tonnes (24,642 urban tonnes and 725 rural tonnes) of hazardous materials that entered the province's landfills in 2006.

As in other waste categories, when broken down into smaller, more specific material types, it becomes somewhat tricky to make estimates as to the composition of hazardous waste. Few regions in BC measure a secondary breakdown of hazardous waste, making it even more difficult to gauge its prevalence in landfills. The least populous regions do not report a material-based classification for hazardous waste at all, so estimates of material categorization in this section of the report are for urban British Columbia only. This is not as problematic as one might think, as most of the hazardous waste disposed of in the residential and IC&I sectors is generated from the urban parts of the province (See Table 3 and Table 4).

Population data, along with overall hazardous waste disposal rates and the percentage of specific hazardous materials recorded by one of the province's urban districts, were used to generate an estimate of the quantities of types of hazardous waste disposed of in landfills. The region with the most detailed breakdown of hazardous materials is the Capital Regional District (CRD) and the shares reported in its most recent waste composition study were consequently chosen to use in the calculation of estimates for urban BC. Of course, different regions have access to different stewardship programs and facilities and while the CRD may not be representative of the province as a whole, only its shares by type of material were used in estimates, not its overall tonnage reported. In other words, since stewardship programs are perhaps more widespread and widely-utilized in this district, even though less hazardous waste (fewer tonnes per capita) may be disposed of in the CRD than in other parts of the province, the shares of the types of materials that *do* end up in landfills can be used to estimate the tonnage of materials disposed of in other urban parts of BC.

Also of note, as explained earlier in the report, the Construction, Renovation and Demolition sector has a different methodology for estimating waste composition and hazardous waste is not among the categories included. However, the CR&D sector has wide access to stewardship programs for hazardous waste at specific plants, and these materials do not end up in landfills. Consequently, in all likelihood, the CR&D sector is responsible for very minimal hazardous waste disposal at landfills and the effects of its exclusion are likely minimal.

Although not ideal, these factors combine to create the most feasible way of estimating the breakdown of hazardous waste material disposed of in the province's landfills in 2006. The reader should, nonetheless, be cautioned that these numbers are heavily rounded and should be considered estimates only.

Composition of Hazardous Waste Materials

In general, and not surprisingly, the composition of hazardous wastes from the residential and industrial, commercial and institutional (IC&I) sectors differs substantially, although a few similarities are apparent. Despite being the source of significantly less hazardous waste overall, the residential sector disposed of more tonnes of 'other' empty aerosol cans than the IC&I sector. Nearly half (an estimated 47%) of the IC&I sector's hazardous waste was comprised of empty metal paint cans, and empty oil containers, whereas the largest contributors to hazardous waste in the residential sector were aerosol cans and household batteries. Fluorescent lighting (8%) and lubricating oil (6%) from IC&I sources were also in abundance in landfills, while other types of hazardous were somewhat less prevalent. In the residential sector, oil-based paint, empty paint cans and pharmaceuticals were among other types of hazardous materials with a significant presence in landfills. Table 7 and Table 8 below provide a detailed breakdown by type of material for each sector, while Figure 5 shows the overall composition for both sectors combined.

Table 7: Estimated Composition of Residential Urban Hazardous Waste Disposed, 2006

Material	Total Tonnage	Percent of Waste
Other empty aerosol cans	1,309	22.9%
Batteries (household)	1,026	17.9%
Other hazardous waste	900	15.7%
Oil based paint, including containers	677	11.8%
Empty metal paint cans/lids	372	6.5%
Pharmaceuticals	245	4.3%
Empty lubricating oil containers	216	3.8%
Auto oil filters	208	3.6%
Latex paint, including containers	201	3.5%
Lubricating oil, including containers	164	2.9%
Empty plastic paint cans/lids	164	2.9%
Paint in aerosol cans	97	1.7%
Total	5,719	100.0%

Source: BC Stats

Table 8: Estimated Composition of IC&I Urban Hazardous Waste Disposed, 2006

Material	Total Tonnage	Percent of Waste
Empty metal paint cans/lids	5,392	28.5%
Empty lubricating oil containers	3,530	18.7%
Fluorescent lighting	1,431	7.6%
Lubricating oil, including containers	1,216	6.4%
Batteries (household)	1,141	6.0%
Latex paint (including containers)	1,066	5.6%
Oil-based paint (including containers)	1,055	5.6%
Other empty aerosol cans	1,044	5.5%
Other hazardous waste	786	4.2%
Empty plastic paint cans/lids	527	2.8%
Paint in aerosol cans	387	2.0%
Empty solvent containers	344	1.8%
Auto oil filters	312	1.6%
Pharmaceuticals (including containers)	301	1.6%
Empty aerosol paint cans/lids	248	1.3%
Needles & sharps	75	0.4%
Solvents (including containers)	54	0.3%
Pesticides (including containers)	11	0.1%
Batteries (automotive)	2	0.0%
Total	18,923	100.0%

Source: BC Stats

Figure 5: Estimated Hazardous Waste Flow in Urban BC, 2006

