

State of Waste: How B.C. compares in the war on trash

February 2019

Highlights

- B.C. produces less solid waste per capita and diverts more materials to recycling and compost facilities than every other Canadian province, after Nova Scotia.
- In Metro Vancouver, approximately 1,400 kilograms of total waste per person – the equivalent weight of a mid-sized automobile – is generated in one year.
- Vancouver produced 318 kilograms of garbage per single family residence in 2017, one of the lowest amounts in Metro Vancouver, while Richmond produced just 292 kilograms per single family residence in 2017.*
- Most of the waste Vancouver sends to landfill or incinerates comes from construction and demolition sites, and is composed chiefly of wood and scrap metal.
- Spoiled and uneaten food represents about 25% of all residential garbage in B.C., more than any other type of waste.
- In Metro Vancouver, 20,000 tonnes of clothing are disposed of annually. That represents more than 2% of all of the region's garbage.
- Recycling and composting efforts divert waste from landfills but more emphasis is needed on waste avoidance, and on the consequences of unnecessary consumption.
- To reduce the amounts of waste our society produces, the report recommends:
 - Individuals and households accept the zero waste challenge, and track the amount of waste they produce.
 - Governments at all levels standardize and make public all current waste collection, diversion and disposal data.
 - Companies and organizations establish mandatory waste reduction and paper-free programs in the workplace.

* Vancouver restated its data after this report was first published on February 5, 2019. Data initially provided by Richmond is now included.

Despite some victories, B.C.'s war on waste is far from over

We sell, we consume, we throw out. Our society generates vast quantities of solid waste, unwanted stuff that is too often dismissed as worthless trash, tossed into bins, loaded into trucks and hauled to a teeming landfill facility where it sits out of sight, out of mind. But garbage cannot be ignored. Around the world, solid waste production is increasing faster than any other environmental pollutant, and landfills are responsible for 5% of all greenhouse gas emissions, including high levels of methane.¹

Canadians in particular are among the world's most prolific waste producers.² Here in British Columbia, more than 2.6 million tonnes of garbage went into landfills in 2016. That's 549 kilograms for every person in the province.³

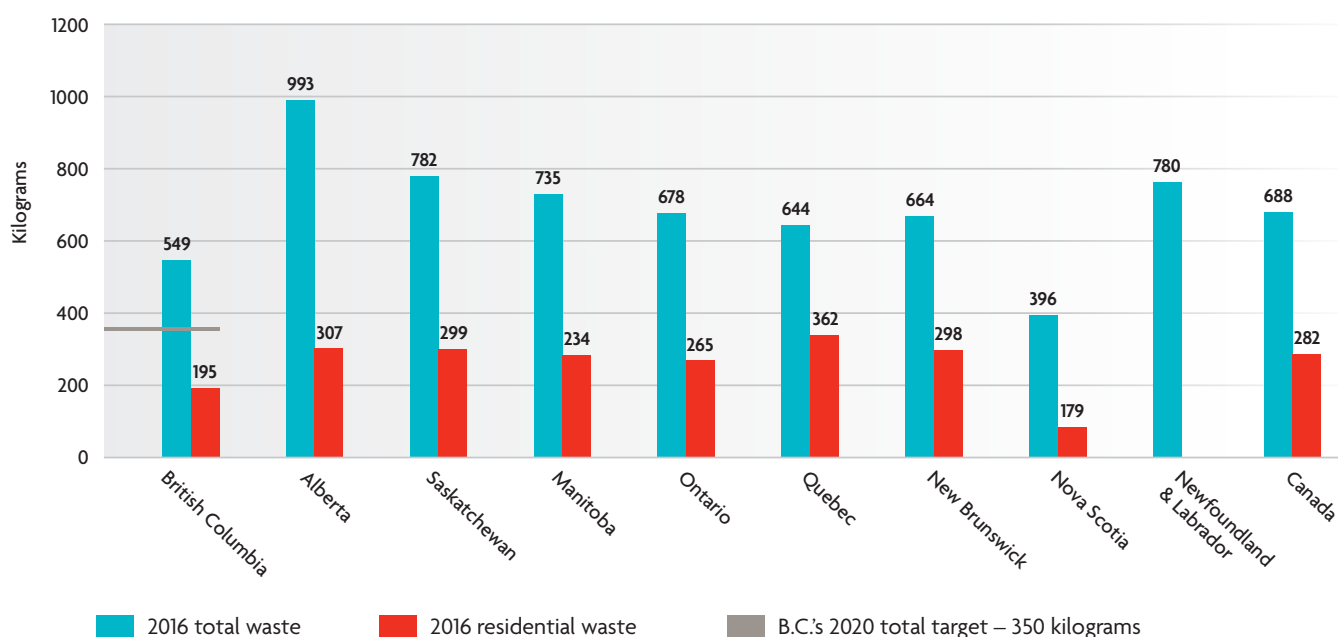
That is unsustainable. But it would be wrong to simply blame individuals. As the United Nations Environment Programme and the Vancouver-based non-profit One Earth noted in a recent report, people "do not intentionally set out to create harmful environmental impacts; these impacts are an unintended consequence of people's efforts to fulfill their needs and aspirations."⁴

The fact is, we live in a system where consumption is emphasized more than conservation. This leads inevitably to more waste production, and to complex problems. What should we do with what we don't use? More to the point, how can we avoid making waste in the first place? No matter its origin – whether waste comes from packaged goods, from workplaces, construction sites and other commercial enterprises – we all have a hand in it.

While most of our cities and towns have modern and sophisticated solid waste management systems, discarded goods and materials are frequently given improper treatment: plastics are flushed into our rivers and oceans; industrial waste sometimes ends up on agricultural land, rendering it unproductive. Used clothing, when it isn't disposed or resold, is often shipped abroad, where it becomes someone else's problem.

This report examines the extent of the solid waste problem across B.C., using available information from numerous open sources and reporting jurisdictions. It demonstrates that a growing proportion of the solid waste we generate is no longer treated as useless detritus and dumped into landfills or incinerated. In fact, data compiled by Statistics Canada show the amount of garbage – or *disposed* waste – produced across the country is trending down, year to year. And among Canadian provinces, only Nova Scotia disposes less waste per capita than B.C. (see Figure 1).⁵

Figure 1: Waste disposed, kilograms per capita



Sources: Statistics Canada Table 38-10-0031 and Statistics Canada 2016 population figures (est)

More waste is being *diverted* instead, to recycling and composting facilities. New programs have been implemented to promote, even enforce, waste diversion. For example, a disposal ban on organics (food and paper waste) and clean wood was successfully launched across the Metro Vancouver regional district in 2015. According to Metro Vancouver, the organics disposal ban “increased diversion by about 60,000 tonnes in its first year alone.”⁶

Industries, businesses and individuals are clearly heeding the message and are doing more to eliminate landfill waste, with diversion rates – the percentage of total municipal solid waste diverted from landfills and incineration – rising across B.C. But few, if any, communities appear on pace to reach a commonly-shared 80% diversion target set for the year 2020.

What goes into our municipal solid waste systems?

The type of waste under discussion in this report – municipal solid waste – includes a lot more than the common detritus pushed out of our homes. In fact, residential waste represents less than half of the total amount of municipal solid waste generated in Canada each year. There are two other sources: industrial, commercial and institutional (ICI) waste from factories, offices, hotels, restaurants, schools and hospitals; and demolition, land-clearing and construction (DLC) waste, which is mainly composed of building materials.

The amount and specific type of waste produced by each municipal solid waste source varies from place to place. It should not surprise that cities experiencing population growth and industrial expansion produce a preponderance of DLC waste. For example, most of the waste the City of Vancouver sends to landfill or incinerates comes from construction and demolition sites, and is composed chiefly of wood and scrap metal. In 2016, “compostable” food and food-soiled paper from residential and ICI sources represented the city’s second largest component of disposed waste, at 29%.¹¹ It should have been diverted. Unfortunately, it was thrown out with the garbage instead.

Diversion is always preferred to disposal, but it has not solved the waste production problem. Indeed, concerns are often raised that an emphasis on diversion – rather than avoidance – can lead to complacency, creating the “illusion” that as long as waste does not go into a landfill, it is somehow acceptable.⁷

And diversion does not come without significant effort and cost. Every empty soda can, pizza box and orange peel must be collected, transported, stored and eventually re-purposed. Each step in the diversion process consumes resources, energy and money that could be spent on other things. The City of Vancouver was forecast to spend almost \$15 million just on compost collection in 2017.⁸

Combined, Metro Vancouver’s disposed and diverted waste – or municipal solid waste – weighed in at nearly four million tonnes in 2016. That’s 1,370 kilograms for every person, the equivalent weight of a mid-sized automobile – or three grand pianos.⁹ Handling all of this material is massively complex and expensive. In 2014, for example, almost \$500 million was spent managing B.C.’s municipal solid waste, from collection to disposal, recycling and composting.¹⁰ And with landfills nearing capacity, current waste management systems are reaching operational limits.

One solution seems obvious. We can stop making waste. B.C.’s regional districts and various municipalities are aware of the problem and are putting more emphasis on waste *avoidance* and *reduction*, two preferred strategies at the top of the familiar waste management hierarchy: *Avoid, reduce, reuse, recycle, recover, dispose*.



Ambitious waste reduction targets have recently been introduced, such as the City of Vancouver's "Zero Waste" goal for the year 2040.¹² While the city calls its zero waste target "aspirational," progress is being made. Vancouver reported a 23% reduction in solid waste disposal in 2017, from its 2008 baseline amount.¹³

Encouraging individuals to "buy in" to initiatives such as the zero waste challenge is really just a piece of the puzzle. Coming to grips with the size of the problem – measuring the amounts of our waste that we generate, dispose, divert and can ultimately avoid and reduce – is just as important. It is also notoriously difficult, because calculations and metrics vary by jurisdiction. Some data are simply missing, making accurate counts and comparisons a complicated, sometimes impossible, task.

Many large urban centres in B.C. engage private contractors to collect and haul waste, recyclables and compost from multi-family residences, such as apartment and condominium buildings. Data from these private sources are not always made public, nor are they required to be. As a result, some cities do not have or do not share complete waste disposal and diversion numbers. Some rely on estimates, which do not provide a complete picture of local diversion activities and participation.

Waste management data for First Nations and small and rural regional districts are also lacking. The Government of British Columbia has recognized that in general, these communities face "distinct challenges" regarding waste-related services due to dispersed populations. First Nations in particular require specific consultation and engagement strategies to measure and improve outcomes, according to the provincial government.¹⁴

B.C.'s waste-reduction rate must increase to meet its 2020 target.

Despite data gaps, the waste situation can still be assessed. This report demonstrates the quantity and type of waste produced, disposed and diverted, and where it eventually ends up. The report also compares reduction initiatives and progress, identifies successes and setbacks, and offers recommendations to government, industry and individuals that may help our shared spaces, cities, province and planet become cleaner, healthier and more beautiful.

Taking out the trash: Waste disposal

Not all waste is treated equally. It is important to understand the difference between disposed waste and diverted waste. The latter is treated as a commodity and directed to recycling and composting facilities for processing and re-use, while the former is considered garbage and sent either to landfills or to an incineration plant, such as Metro Vancouver's Waste-to-Energy "mass-burn." The Burnaby-based facility receives about one-quarter of the regional district's garbage and converts it into electricity, which is then sold.¹⁵

Despite its popularity in countries such as Sweden and Germany, waste incineration remains controversial here at home, even with improved technologies that can reduce and contain toxic emissions. What's more, some argue that removing waste through incineration sends a message that waste production can be easily managed and is therefore okay.

The fact remains, disposed waste – via the landfill or incineration – is the least desirable form of municipal solid waste produced by humans. Yet it is the most common.

According to Statistics Canada, almost 25 million tonnes of non-hazardous solid waste were directed to public and private disposal facilities across the country in 2016. That includes residential waste, industrial, commercial and institutional waste and demolition, land-clearing and construction waste, and represents 688 kilograms of garbage per person.

B.C. produced 549 kilograms of garbage per person in 2016, or 30% less than the national per capita average. The province also managed to reduce its per capita waste disposal by 15% between 2008 and 2016; only Quebec posted a better reduction rate (17%) over the same period.¹⁶ While encouraging, the reduction rate must increase if B.C. is to meet a province-wide waste disposal target for the year 2020, set at 350 kilograms per capita. A previous target – 550 kilograms per person – was set in 2013, and has been met, but just barely.¹⁷ Without rapid systemic improvements and greater public participation, the latest, more aggressive target won't be reached by deadline.

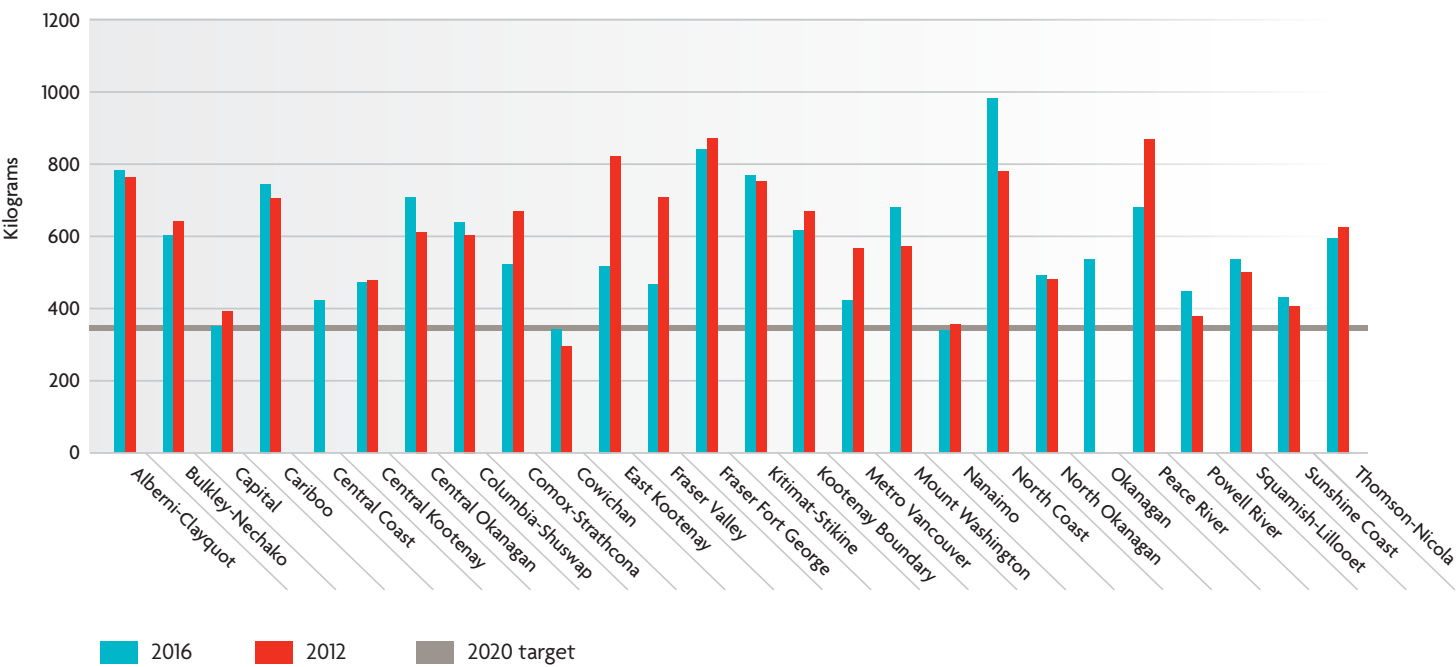
More action is required, especially at the residential level, where 36% of the province's garbage was produced in 2016. This does not compare well to previous years: In 2008, for example, households produced 34% of B.C.'s garbage. In other words, the proportion of solid waste that comes from our homes is on the rise.¹⁸

On the bright side, some regional districts – all of them on Vancouver Island – have already met or surpassed the 350 kilogram target. The Capital Regional District, which includes the City of Victoria, recorded 348 kilograms of garbage per person in 2016. The Regional District of Cowichan weighed in with 346 kilograms per capita. And the Regional District of Nanaimo disposed of just 341 kilograms, making it B.C.'s waste avoidance pace-setter (see Figure 2).¹⁹

Because waste collection methods and data reporting are not uniform, comparing disposal rates at the municipal level in B.C. is challenging. In Metro Vancouver, waste collected from one municipality may be co-mingled with waste from an adjacent community before disposal. As noted previously, some cities rely on private companies to collect residential and commercial waste and do not share their data with the general public.

But it is possible to calculate and compare the amount of waste generated per *single-family residence* (SFR), by jurisdictions that report such data. This approach reveals surprising disparities among cities in Metro Vancouver, where more than half of B.C.'s total solid waste is generated.²⁰

Figure 2: Waste disposed per capita, B.C. regional districts



Source: Environmental Reporting B.C., "Municipal Solid Waste Disposal in B.C. 1990-2016"

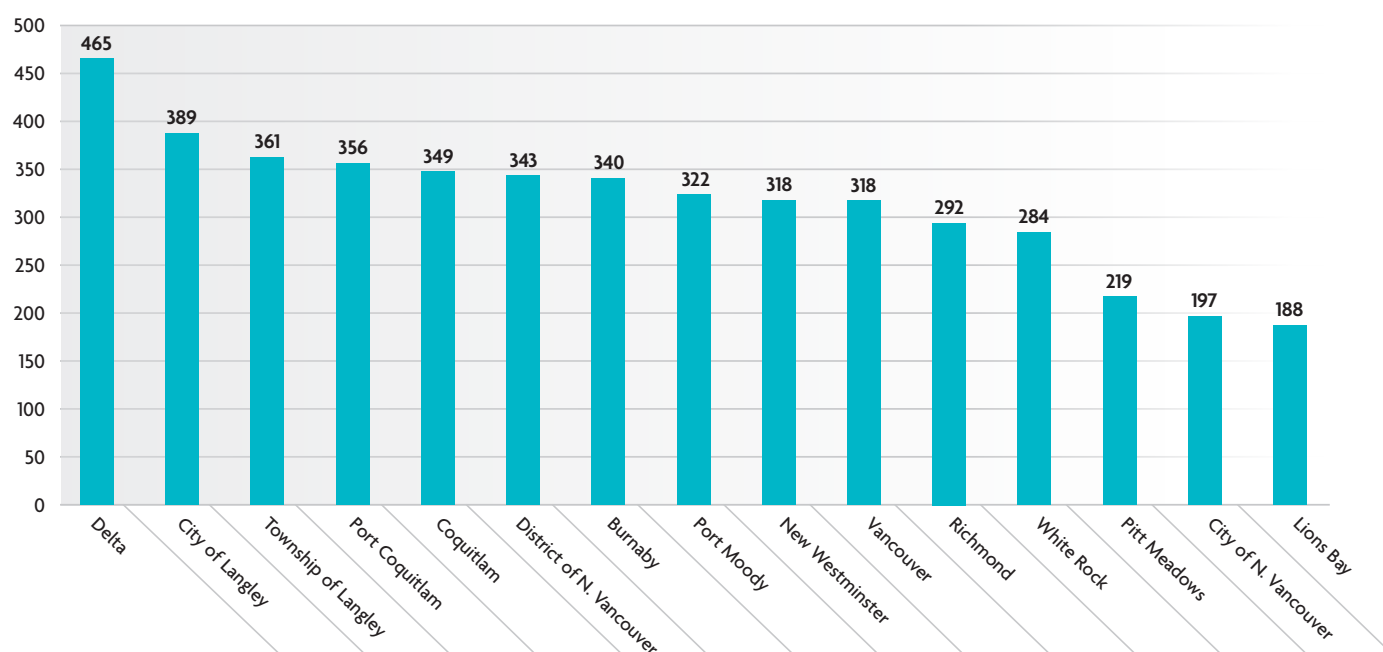
Vancouver produces less single-family residential waste for disposal than many other municipalities in its regional district.²¹ In 2017, Vancouver sent 318 kilograms of waste per SFR to landfill or to incineration. Residents of the City of North Vancouver, by contrast, disposed of just 197 kilograms of waste per SFR in the same year. Delta was the biggest producer of garbage, at 465 kilograms per SFR. Several other large centres such as Surrey and West Vancouver did not share their SFR waste disposal data. (See Figure 3).

These disposal rates are simply unsustainable; after all, landfills do not have unlimited capacity. Metro Vancouver's one designated landfill facility, located in Delta, received 68% of the region's annual disposed waste in 2017, or

736,000 tonnes. That was a 6% increase from the previous year. The 52-year-old landfill, now 320 hectares in size, will reach its maximum capacity in 2031 at the current rate.²²

Landfills also contain toxins which can leach into soil and groundwater, and they produce greenhouse gases, including methane, which can damage the environment and endanger human health. Most of the methane generated at the Vancouver landfill is captured, and is then either flared or piped off-site to generate electricity, some of which is used to heat local greenhouses or sold to BC Hydro.²³ But many landfills across the province are not equipped to manage their gas emissions as efficiently. Provincial regulations only require that landfill gas is captured and flared.²⁴

Figure 3: Kilograms of waste disposed per single-family residence, 2017



Sources: Municipal waste disposal data and Statistics Canada population data
 *Surrey and West Vancouver did not provide data.

Food waste is staggering

Globally, one-third of all food produced for human consumption is either thrown away after purchase or spoiled during production, preparation, transportation and sales.²⁵ It should come as no surprise that people in countries where food is abundant are the most prolific wasters. Canadians, for example, disposed of \$31 billion worth of uneaten food in 2014 – mostly fruits, vegetables and meat – or the equivalent of 396 kilograms per person.^{26, 27}

Almost half of the food that we waste in this country is discarded from our own homes. A 2014 study revealed the extent of the problem in Metro Vancouver, where the equivalent of 80,000 potatoes, 70,000 cups of milk, 55,000 apples, 40,000 tomatoes, 32,000 loaves of bread and 30,000 eggs are wasted *each day*, at an annual cost of about \$700 per household.²⁸

Waste composition studies conducted in various B.C. communities reveal that spoiled and uneaten food represents about 25% of all residential garbage thrown into landfills or incinerated. That's more than any other type of material we discard. Worse, most of that food waste is compostable. While by-laws banning compostable food waste from garbage disposal already exist in some jurisdictions, a lot of food still ends up in the dump and cannot be repurposed.²⁹

This can easily be avoided. Individuals can do their part, by obtaining only the food they and their families

*Spoiled and uneaten food represents about **25%** of all residential garbage thrown into landfills or incinerated.*

require, and by composting – rather than disposing – what cannot be consumed, such as peels, pits and bones. It's important to remember that access to convenient waste collection programs – including compost – is not a valid reason to discard food. Edible food should never be considered “surplus” or unwanted.

“Best before” dates stamped on many food items are also misunderstood. Research has found that 80% of consumers use these labels to determine whether to throw away food or keep it. In fact, “best before” dates are meant to indicate food quality, not food safety or expiry. Most food items can be consumed with confidence after the “best before” date has passed. Canada's National Zero Waste Council has recently called for “greater clarity about the information these date labels provide” to “reduce the unnecessary disposal of safe and healthy food, either by consumers or businesses who remove them prematurely from their shelves.”³⁰



Vancouver's Food Stash Foundation rescues food that might otherwise be thrown away.

Credit: David Schein

Fashion fast to landfill

Textiles may not always come to mind when thinking about waste, but they represent one of the world's fastest-growing streams of discarded material. Textiles include all forms of fabric, including materials used to make clothing. In the developed world, where "fast fashion" industries encourage consumers to purchase new apparel in quick succession, more used clothes are being tossed into landfills. In Metro Vancouver alone, 20,000 tonnes of apparel are disposed of annually. That represents more than 2% of all of the region's garbage.³¹

*In Canada, only **25%** of all donated clothes are resold or reused locally.*

Most clothing material made from natural fibres can be reused and repurposed. Opportunities for closed-loop recycling – in which the waste of one process or product is used in making another – seem obvious when it comes to many worn fabrics. Used clothing can also be sold or given away. But those solutions are either being ignored or aren't as effective as one might expect.

For example, putting used clothing into a charity donation box is no guarantee it will ever be worn again or repurposed. In Canada, only 25% of all donated clothes are resold or reused locally, according to one recent news report. Most donated clothes are exported to developing world countries, where they often remain unused. In the event they are resold, they can disrupt domestic textile and apparel trades.³²

The authors of a local report that examines the clothing waste situation say that "rapidly changing trends" and "relatively low prices" have created an environment in which clothes are now considered disposable, like paper. Textile recycling is insufficient

at present levels. "Globally, only 0.1% of collected textile waste is made into new garments," they note. This is due in part to the fact that synthetic fibres including polyester and acrylic represent 55% of the global fibre market, and "such fibres are difficult to recycle." In addition, synthetics when washed can shed micro plastics, which end up in rivers, lakes, oceans and potentially the food chain.³³

The authors suggest that apparel industries move from "fast fashion" to "circular fashion," a system that minimizes "waste and environmental impacts while maximizing profits. Apparel circulating through the circular fashion system is designed so that it becomes a resource (asset) instead of a waste (liability) at the end of its life. In practice, this translates to products that are designed to last; and products that are designed to be recycled or returned to the biological cycle at the end of their useful life. Circular fashion employs the following circular business models to maximize the profits from each garment in circulation: repair and maintenance, rent and resell, recertify and reimagine, and closed-loop recycling."³⁴



A clothing fix-it, organized by Vancouver's **Framework Education Society**. Credit: Hamid Attie

Ditching the dump: Waste diversion

Diverting municipal solid waste from disposal streams and landfills is easier than ever, especially for urban dwellers. Recycling and composting programs are now commonplace, the familiar blue and green bins practically ubiquitous.

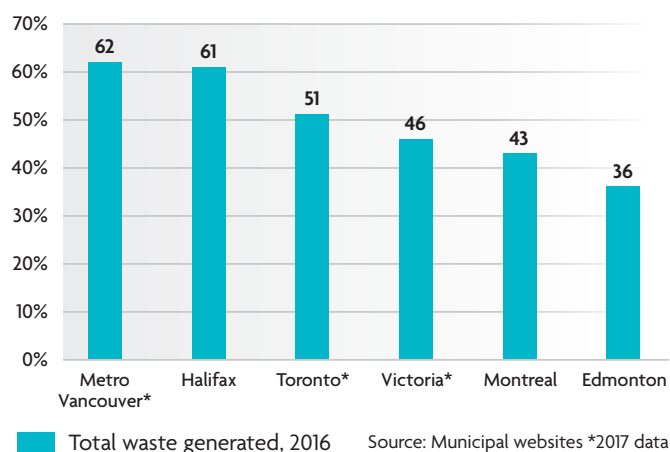
The benefits are significant. Recycling materials such as wood, pulp and paper, plastics, glass and metals helps prevent the depletion of natural resources. It also creates economic opportunities, with more companies producing new products from diverted materials. Less energy – fossil fuel, for example – is required to produce recycled goods than similar items made from raw materials. Composting yard waste and food scraps – by far the most common sources of residential waste – produces healthy new soil that returns nutrients to the earth and helps curb erosion, among other things. Organic waste that is trapped in a landfill produces methane, a powerful greenhouse gas. Treated as compost, the same waste produces carbon dioxide, which is much less harmful to the environment than methane.³⁵

The message is being heard. A 2017 survey of more than 800 B.C. adults conducted for Vancity revealed that 85% of respondents recycle “all the time,” while 50% compost “all the time.” And as noted earlier, provincial diversion rates – the percentage of total waste generated that goes into recycling or composting facilities – are increasing, with B.C. helping lead the way. Unfortunately, diversion data collection and calculations by governments are inconsistent at the regional and municipal levels; there are no standard diversion reporting metrics for B.C. communities. This makes year by year, source by source progress difficult to measure and compare.

For example, some B.C. municipalities report diversion rates for single-family residences only; others do not distinguish between single-family residences, multi-family residences, businesses and industry. A few municipalities do not collect or report diversion figures at all. The City of Vancouver adopted a diversion rate of 62% for 2016, but the figure was borrowed from Metro Vancouver’s overall diversion rate, which covers 21 municipalities, one Electoral Area (the University of British Columbia) and one Treaty First Nation (Tsawwassen First Nation).^{36 37}

Metro Vancouver’s diversion rate includes waste from all residential, industrial, commercial and residential and demolition, land clearing and construction sources.³⁸ The rate has climbed steadily since 1994, when it was below 40%, and is now the best among Canadian municipalities that report such data (see Figure 4).³⁹

Figure 4: Diversion rate (% of total waste generated)



Most urban municipalities in B.C. are striving to meet an 80% diversion rate target, now common for many North American cities, for the year 2020. Some appear to be within striking distance. Pitt Meadows (78%), Port Moody (75%), Langley (70%), the District of North Vancouver (64%), Burnaby (59.4%) and New Westminster (56%) are all moving in the right direction with their overall diversion rates. On Vancouver Island, Esquimalt claims a 64% rate, while Victoria and the District of Saanich are well behind, at 46% and 40% respectively.⁴⁰

Even the most lacklustre diversion rates in B.C. demolished the national average (27%) in 2016. Province-wide, B.C.’s total waste diversion rate in 2016 was 40%; only Nova Scotia (44%) claimed a higher rate. B.C. and Nova Scotia shared the country’s highest residential waste diversion rate, at 46% (see Figure 5).⁴¹

While more information is required before local diversion efforts can be fully assessed, Metro Vancouver does offer some useful data. A recent Metro Vancouver report quantifies the type and source of waste diverted from the region’s disposal stream. Concrete is by far the most common material recycled, with almost of all of it coming from demolition, construction and land-clearing (DLC) sources; this corresponds to the region’s housing boom. According to one report, construction waste alone increased 40% in Metro Vancouver from 2011 to 2015.⁴² And in 2016, half of all waste diverted in the region came from the DLC sector, in fact, while just 18% came from residential sources – most of it yard and food waste (see Figure 6).⁴³

As noted earlier, diversion is better than disposal, but it is no panacea to our massive waste problem. There is no such thing as a perfect waste diversion system. Compost and recycling contamination is a common – and expensive – problem across Canada. “Even a few spoonfuls of peanut butter left in a jar can contaminate a tonne of paper and make it unmarketable, destined for the dump,” the CBC reported earlier this year. “Same for that glob of yogurt left in the bottom of the container.”

One source told the broadcaster that almost a third of materials placed in blue recycling containers “shouldn’t

be there...Things like blood bags. Things like IV tubing. Things like needles and sharps. Things like dead animals. Things like bullets.” According to the CBC report, municipal contamination rates range from 3% in St. John’s to 26% in Toronto. The City of Vancouver’s recycling contamination rate checks in at a relatively modest 4.6%.⁴⁴

All of these examples point to a single, sobering conclusion: As a society, we need to avoid waste-producing materials. That means reducing their production, purchase and consumption.

Figure 5: Diversion rate (% of waste generated) by province, 2016

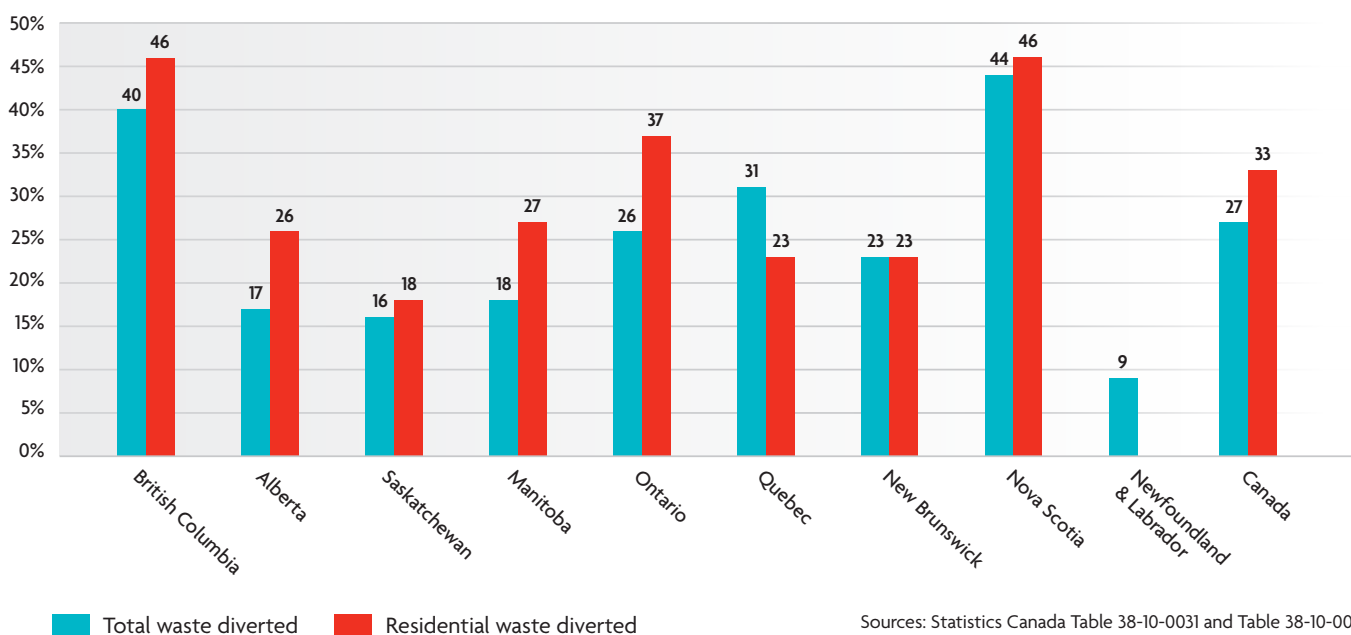
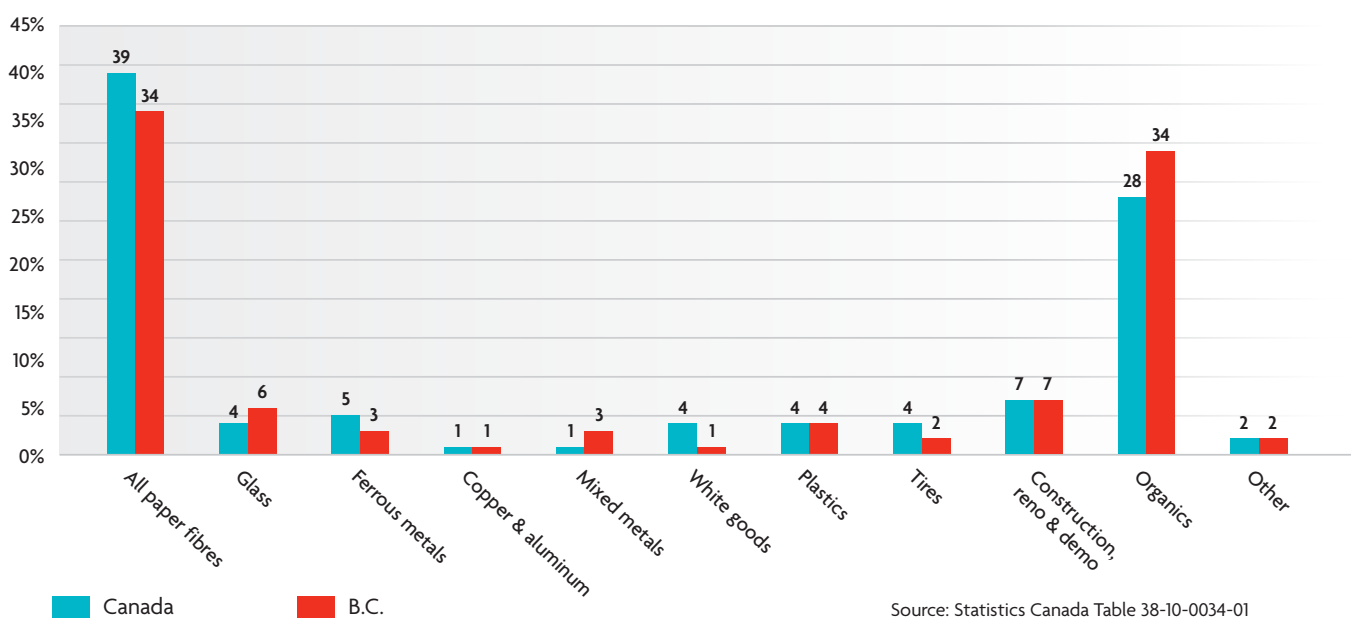


Figure 6: Diverted materials, by type, 2016



Illegal dumping on the rise

Proper waste management procedures – disposal and diversion – are strictly regulated and follow professional standards. Unfortunately, some people turn to an alternative form of waste removal that is highly undesirable yet increasingly common.

Illegal dumping is on the rise. In the City of Vancouver alone, the amount of abandoned trash that city workers were forced to collect from streets, alleyways and parks increased 40% between 2009 and 2016, to 2,465 tonnes. It now consumes 13% of the city's annual street cleaning budget, according to one recent report.⁴⁵

Commonly dumped materials include mattresses and furniture, large kitchen appliances and electronic goods. Transgressors make all kinds of excuses for abandoning their unwanted stuff: They could not get to a municipal landfill transfer or recycling station; they could not afford any fees that might be involved; they were not aware that dumping is illegal.

There's another, even more pernicious form of illegal dumping. Construction waste is being spread on land designated for agricultural use. It happens in Metro

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Vancouver, Vancouver Island, the B.C. interior and elsewhere, usually in places experiencing rapid urban development.

In some cases, agricultural landowners reportedly accept payment for loads of construction waste – crushed concrete, drywall, rebar, etcetera – material that by law must be disposed of in regulated facilities. According to one recent report, a dump truck load of mixed construction waste and other matter can cost between \$1,100 and \$1,400 to dispose of legally. Some owners of properties protected from development by provincial Agricultural Land Reserve regulations will accept \$200 per load of construction waste, despite the threat of fines that can reach as high as \$10,000.⁴⁶



North Vancouver's *Green Coast Rubbish* helps people dispose – and divert – materials responsibly.
Credit: Hamid Attie

Want not, waste not: Waste avoidance

Achieving zero waste may not be possible, but we should at least aim for it. That's the conclusion reached in The Do Something Project, a blog by New Jersey writer Catherine Agopcan. Her observations reflect the universality of the waste problem and should resonate with everyone, no matter their location or individual experience.

Waste is a “completely human” output, she points out, “based on our own chronic consumption.” As for zero waste, it's really just “a way of thinking. There is no right or wrong, just the intent to reduce waste the best way we can, given where we live in the world and the resources available to us.”⁴⁷

The sentiment is echoed by the Recycling Council of British Columbia (RCBC), established in 1974 to “facilitate the exchange of ideas and knowledge that enable efficient solutions to eliminate waste.” Zero waste, it says, is both a goal and a philosophy. “The idea is to reduce consumption as much as possible by using design-for-environment in all products and their packaging, and to make packaging recyclable.”⁴⁸

Across B.C., different levels of government have launched zero waste initiatives, often with little fanfare or public knowledge. Metro Vancouver launched a Zero Waste Challenge – with an initial 70% waste diversion rate target – more than a decade ago. The Regional District of Nanaimo adopted a zero waste goal way back in 2001.⁴⁹

Lately, more individuals and businesses are accepting the challenge. Zero waste shops have opened recently in Metro Vancouver and on Salt Spring Island. Farmers markets represent another opportunity for zero waste shopping, with local, unpackaged produce on offer.⁵⁰ And some people are accepting the challenge to reduce their household waste, with impressive results.⁵¹

Recent polling and opinion survey results suggest that we still have much to learn, let alone acknowledge. For example, an Abacus Data poll in June 2018 asked Canadians about plastic garbage in our oceans and waterways. Fewer than 40% of those surveyed said they probably or certainly contribute to the problem. On the other hand, a large majority agreed that governments should “encourage retailers, consumer products companies and restaurant chains to make changes that reduce the amount of plastic

Nanaimo adopted a zero waste goal way back in 2001.

that ends up in garbage,” while a slightly smaller majority agreed that regulations should direct specific changes.⁵²

But how much individual effort and money are people willing to expend themselves?

Here in B.C., most municipalities directly bill homeowners, businesses and industries for regular waste collection, diversion and disposal, via utilities fees tacked onto their property and business taxes. In the City of Vancouver, the annual collection rate for the average single-family home is \$294.⁵³ Materials that cannot be collected or do not qualify for normal service must be transferred by individual parties to waste transfer stations, where they will be accepted and processed for a nominal fee.

In Vancouver, for example, mattresses may be dropped off at a local transfer station, at a cost of \$15 per piece. That seems a small price to pay, given the inconvenience that an abandoned mattress can cause neighbours and others. Illegal dumping hurts financially, as well: Offenders can be forced to pay penalties as high as \$500, and may face prosecution.⁵⁴

There are incentives, as well. In 2018, Vancouver opened a new recycling centre that accepts some materials free of charge. These include used cooking oils, clothing and textiles, foam packaging, large and small appliances and scrap metal. The facility has proven so popular that its daily hours of operation have increased.

Making waste diversion more convenient helps direct discarded materials from the landfill, but, as noted earlier, diversion is no panacea. Avoidance – mainly through less consumption of unsustainable goods – remains the easiest, most cost-effective way to manage and reduce our waste problem. That, and other strategies noted in the following recommendations, should be carefully considered and adopted where possible.

Recommendations

Governments

- Introduce measures to standardize and make public all waste collection, diversion and disposal data, requiring all reporting agencies to update their data on open sources every year and collect and share data related to multi-residential dwellings.
- Promote waste reduction strategies by recognizing and rewarding communities and private and public interests that reach target goals.
- Incrementally allocate 30% or more of waste management budgets into efforts that reduce waste production.
- Form an independent public board of inquiry to examine the pros and cons of waste incineration, and act on its findings and recommendations.
- Prevent organics and recyclables from landing in waste disposal streams by creating more opportunities for diversion. Consider placing and enforcing disposal limits on residential, industrial, commercial and institutional (ICI) and demolition, land-clearing and construction (DLC) sources.

Companies and organizations

- Establish waste reduction and paper-free targets in the workplace. Provide necessary waste diversion and avoidance infrastructure – i.e.: recycling and compost bins, packaging-free snacks, digital alternatives – inside the workplace. Track and share results with employees.
- Use reusable dishware and other products at events. Do not offer single-use, disposable or plastic promotional products and gifts to customers and employees.
- Provide space in the workplace for swapping items such as books, clothing, sporting equipment and electronics.
- Offer customers the same waste reduction opportunities, and provide them services and products that do not create waste.
- Establish programs that encourage and enable customers to recycle used or unwanted products, such as take-back programs offered by some fashion industry players.

Financial institutions

- Support the growth of green businesses and practices such as closed-loop recycling, with preferred rate loans and accounts.
- Invest in projects that support the circular economy, including local fix-it, resale and lending initiatives.
- Direct “rewards” products away from merchandise and toward experiences that align with sustainable living.
- Fund environmental initiatives that specifically include waste reduction efforts.

Individuals

- Consider how you might embrace “Lighter Living” to foster more sustainable communities by consuming less, wasting less, and sharing more.
- Take a zero waste challenge and track your results. Do not be discouraged if you and your family do not reach zero waste; the goal is to rethink, reduce, reuse and recycle.
- Look for sustainable materials for home improvement projects, such as bamboo and cork, and reclaimed wood and metal.
- Join a local tool and equipment lending library and donate items you don't often use.
- Avoid buying and accepting single-use products and containers. Buy local whenever possible, and in bulk.
- Treat leftover food as your next meal, not as waste.
- Join the slow fashion movement by purchasing clothes that will be worn often.
- Visit resale shops, neighbourhood swaps and online networks for clothing and household items such as furniture and appliances.
- Compost at home. Many municipalities and environmental organizations offer composting kits for use in houses and apartments.
- Develop a better understanding of where municipal solid waste goes. Visit your local landfill and waste diversion centre. Many municipalities offer the public free guided tours.

Methodology

Primary and secondary data were used in this study. Data sources include Statistics Canada, the Government of British Columbia, regional districts and municipal governments. Interviews with regional districts and municipal agencies

associated with waste handling were also conducted, while email correspondence was exchanged with others. In some cases (ie: disposed waste kgs/single family residence), data were gathered from individual regional and/or municipal sources with common metrics applied for a unified basis of comparison.

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