

A Zero Waste Review of the Capital Regional District's Draft Solid Waste Management Plan



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1 CONTEXT

Under the *Environmental Management Act*, the Province of BC requires that each Regional District develop and implement a Solid Waste Management Plan (SWMP). These plans are to be renewed every ten years (previously every five years but now with an effectiveness review at five years) and require public consultation before submission to the Ministry of the Environment and Climate Change Strategy (the Ministry) for ministerial approval.

The Capital Regional District (CRD) last updated SWMP is from 1995 and though it has been amended over the years, the 2020 draft SWMP represents the first update since then.

This report is a review of the draft SWMP from a Zero Waste perspective, which is to greatly decrease the need for landfill expansion through minimizing waste with all of the concurrent benefits. The report will outline what Zero Waste is and why it should be pursued, followed by a review of the draft SWMP using the Zero Waste Hierarchy and a discussion of solid waste system funding.

2 ZERO WASTE

2.1 Definition

Zero Waste is “The conservation of all resources by means of responsible production, consumption, reuse, and recovery of products, packaging, and materials without burning and with no discharges to land, water, or air that threaten the environment or human health.”¹ This Zero Waste International Alliance (ZWIA) definition is peer-reviewed and is in contrast to “Zero Waste to Landfill” which is an industry-created definition meant to promote burning of waste and often requires no changes in separation of materials nor reduction of waste. Many organizations, including the City of Victoria, are using the ZWIA definition to provide the vision of what their actions are driving towards. While some may focus on the elimination of waste at the end of pipe, the key aspect is the conservation of resources and eliminating problematic materials and products, starting at the design stage. The highest level of recognition as a Zero Waste Community by ZWIA is when a local government has reduced disposal (to landfills, incineration and the environment) by 90% or more but communities are encouraged to embark on the process beginning with the level “Working Towards Zero Waste”.²

2.2 Zero Waste Hierarchy

To aid in understanding the scope of policies and strategies that are part of Zero Waste plans and to evaluate them, ZWIA developed a hierarchy (see Appendix A). The Zero Waste hierarchy defines each level of the hierarchy and includes the guiding questions, principles and definitions. Zero Waste is more than just having no waste but includes systemic changes to our ways of producing and consuming materials starting at the top of this hierarchy.

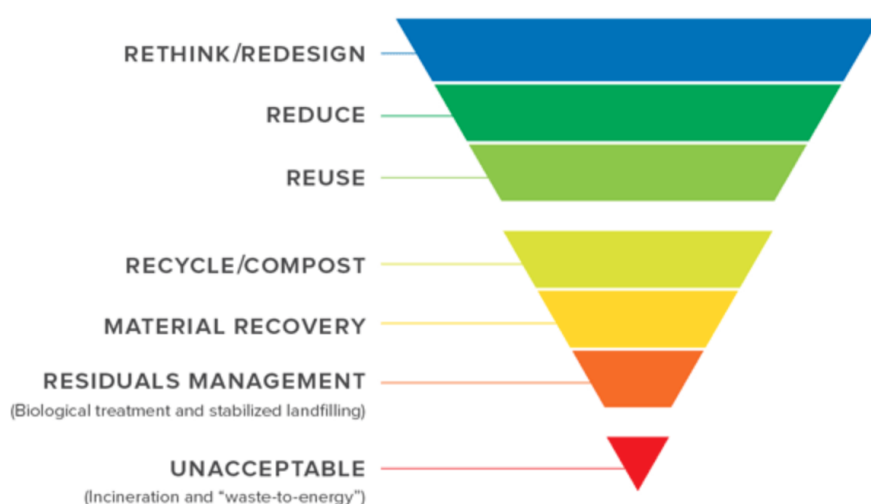
The levels of the hierarchy are shown in Figure 1. The upper levels of the hierarchy are larger to emphasize that the most benefit in terms of the guiding principles arises from actions taken in these areas. The top three levels help to prevent waste while recycling and composting put the materials back in the useful loop. Material recovery

¹ Zero Waste International Alliance (2018). Definition accessed at <http://zwia.org/zero-waste-definition/>.

² Zero Waste International Alliance (2014). Zero Waste Community Certification. Accessed at <http://zwia.org/zero-waste-community-certification/>.

can put further materials back in the loop or sequester materials that would be harmful to recirculate (such as mercury or asbestos). Residuals management looks at what can be learned from what remains to continually improve Zero Waste systems. Destructive disposal systems are deemed unacceptable for many reasons. They destroy materials and thus the materials and the embodied energy³ are lost; the technology is usually very expensive to both build and operate, and takes years to build so the opportunity costs⁴ are high; all atoms going in must come out in some form and sometimes new more harmful molecules (such as dioxins and furans) are formed so pollution is a concern, and pollution reduction or capture technologies are expensive and do not fully mitigate the issue; the energy produced is often carbon-based with significant greenhouse gas impacts; and there is still residual waste to manage in landfills. This clear stance is in contrast to the pollution prevention hierarchy still used by the Province⁵ which has the steps of Reduce, Reuse, Recycle, Recovery (materials and/or energy) and then Residuals Management. The Zero Waste Hierarchy was developed, in part, based on the experience of Europe where waste to energy or incineration was used extensively at significant expense but with harmful consequences and no real reduction in the throughput of materials.⁶ Both hierarchies are designed to be planning tools, starting at the top, and the provincial website states that “once all achievable opportunities at a higher level have been taken, only then should the next level be looked at.”⁷

Figure 1 Zero Waste Hierarchy



³ Embodied energy is the energy all along the lifecycle that it took to make and deliver the products.

⁴ Opportunity costs are what other actions were not taken due to the resources (staff, time or money) being spent elsewhere.

⁵ Ministry of Environment and Climate Change Strategy (2020). 5R pollution prevention hierarchy. Accessed at <https://www2.gov.bc.ca/gov/content/environment/waste-management/zero-waste>.

⁶ GAIA (2020). 5 reasons why Europe’s garbage burning is a big problem. Accessed at <https://www.no-burn.org/europewasteburning/>.

⁷ Ministry of Environment and Climate Change Strategy (2020). 5R pollution prevention hierarchy. Accessed at <https://www2.gov.bc.ca/gov/content/environment/waste-management/zero-waste>.

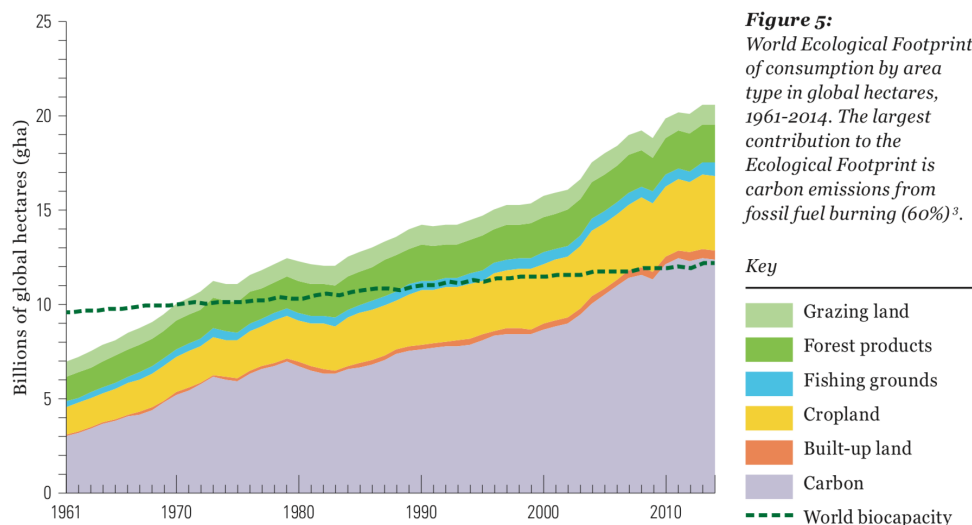
2.3 Circular Economy

A related concept to Zero Waste is the Circular Economy, with both having roots in the Cradle to Cradle concept of McDonough and Braungart.⁸ Like Zero Waste, the Circular Economy also looks to design out waste and pollution, keep materials and products in use and regenerate natural systems.⁹ Both concepts propose to move from a linear take-make-waste system to a circular model. This concept helps to highlight the employment and economic opportunities from reducing material throughput and waste and has growing momentum. The provincial waste planning guideline recommends both concepts be part of solid waste management plans.¹⁰

2.4 Why Zero Waste

As noted, Zero Waste is about more than having no materials for disposal, it is about reducing our footprint on the planet. Consumption patterns globally are not sustainable (see Figure 2 below).¹¹ Collectively humans use more than one planet's worth of area to provide goods and absorb wastes. This results in an ecological deficit where resources are not replenishing nor wastes absorbed to match the rate of consumption of materials or production of wastes. Growing and extracting materials and producing products has resulted in habitat and species loss, diminished soil quality, increased energy and water use, greenhouse gas emissions and other forms of pollution as well as the resulting solid waste. In addition to these ecological symptoms, there are also social ones such as inequity, injustices and human health risks. We are all starting to see the consequences of this, locally and globally.

Figure 2 Ecological Footprint of Consumption



⁸ McDonough, W. & Braungart, M. (2002). Cradle to Cradle: Remaking the Way We Make Things. More info at <https://mcdonough.com/cradle-to-cradle/>.

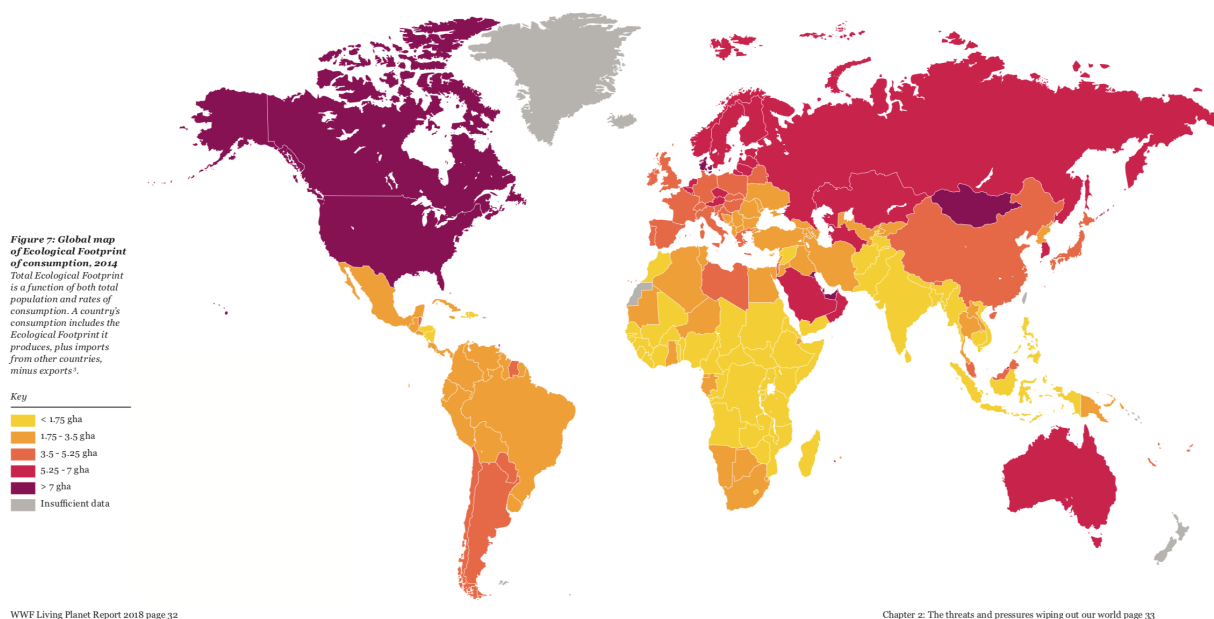
⁹ Ellen MacArthur Foundation (2020). Accessed at <https://www.ellenmacarthurfoundation.org/circular-economy/concept>

¹⁰ BC Ministry of Environment (2016). A Guide to Solid Waste Management Planning. Accessed at <https://www2.gov.bc.ca/assets/gov/environment/waste-management/garbage/swmp.pdf>. Page 16.

¹¹ World Wildlife Fund (2018). Living Planet Report 2018. Accessed at https://wwf.panda.org/knowledge_hub/all_publications/living_planet_report_2018/

Figure 3 below¹² shows that Canada and the US use a disproportionate amount of resources and so need to do more than other regions to decrease consumption of materials and production of wastes. To remedy this, we need to change to Zero Waste and Circular Economy systems. We also need all parties to do their part, whether it is federal, provincial and municipal governments, and businesses pursuing Zero Waste Strategies to citizens choosing purchases wisely and sharing or renting items.

Figure 3 Global Map of Ecological Footprint of Consumption



In addition to the environmental and social reasons to pursue Zero Waste, there is also a strong business case for it as a report commissioned by the Ministry showed with a net economic benefit, an increase in GDP and generation of income tax revenue.¹³ There are many jobs and business opportunities that come with the pursuit of Zero Waste.

There is momentum building for Zero Waste and Circular Economy initiatives globally. In the EU, many cities have signed on to the Circular Cities Declaration.¹⁴ The federal and provincial governments are also planning to take more steps and both have had recent papers out for feedback on some of their next steps. The CRD is well-placed to be a leader in this with the City of Victoria pushing for Zero Waste, Saanich's recent adoption of a plastic bag ban, neighbouring Regional Districts setting good examples, expertise within local academia and the community, a growing number of Zero Waste businesses, and broad support from citizens and environmental groups.

¹² Ibid.

¹³ Hood, I. (2013). Zero Waste Business Case. Accessed at https://www2.gov.bc.ca/assets/gov/environment/waste-management/industrial-waste/industrial-waste/zero_waste_business_case_draft.pdf.

¹⁴ Circular Cities (n.d.). European Circular Cities Declaration. Accessed at https://circularcitiesdeclaration.eu/fileadmin/user_upload/Images/Pages/Images/Circular_City_Declaration/CircularCitiesDeclaration.pdf.

2.5 Role in Climate Change

Key elements of direct emissions from the solid waste management system include gas released from landfills (usually methane and carbon dioxide as a result of organic materials breaking down in anaerobic conditions) and transportation of materials from collection until the final destination. Landfill gas can be captured but the draft plan notes that only 68% was captured in 2018 at the Hartland Landfill. Ministry best practices aim for 75%¹⁵ of the gas (though some systems report higher capture rates) meaning that significant amounts of gas, at least half of it methane, escape. This is especially problematic as methane is a very powerful GHG with a shorter lifespan (an impact of 84-87 global warming potential over a 20 year time span rather than 28-36 of 100 year time span is used).¹⁶ There can also be significant emissions from burning of waste but this is not the case in the CRD at this time.¹⁷

Greenhouse gas (GHG) emissions are often looked at from a sector perspective as dictated by the Community Energy and Emissions Inventory protocol and from this view waste makes up 9% of the 2017 CRD emissions with buildings (36%) and on-road transportation (55%) making up the remainder. However, when looking at emissions from a systems perspective as Figure 4 below shows where all of the upstream emissions for the provision of goods, food and other consumption are included, it is apparent that choices of consumption and wastefulness have a bigger impact on GHGs. When the full ecological footprint is considered, it is clear that consumption choices have a very large impact.¹⁸ This figure shows the comparison for the City of Victoria, which was one of the pilot communities for developing this tool, though other studies have found similar if not identical results.¹⁹

¹⁵ BC Ministry of Environment (2011). Technologies and Best Management Practices for Reducing GHG Emissions from Landfill Guidelines. Accessed at <https://www2.gov.bc.ca/gov/content/environment/waste-management/garbage/landfills>.

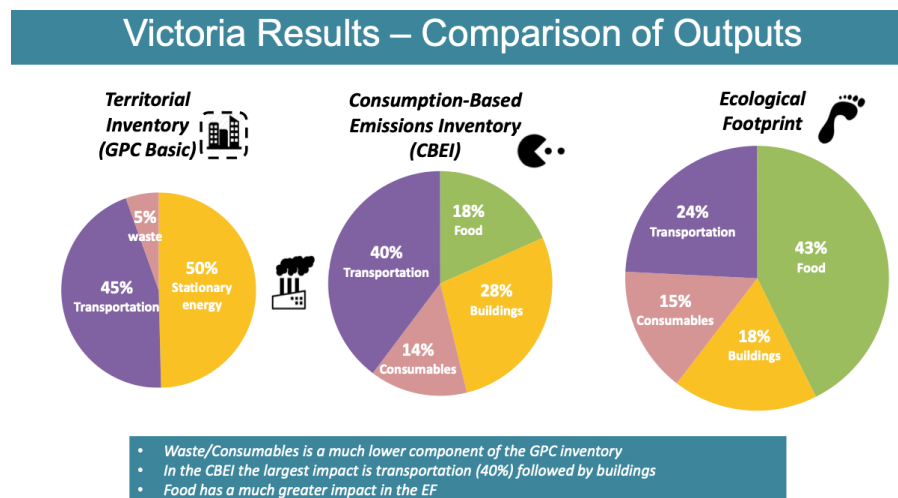
¹⁶ US EPA (2020). Understanding Global Warming Potentials. Accessed at <https://www.epa.gov/ghgemissions/understanding-global-warming-potentials#Learn%20why>.

¹⁷ Using data from Metro Vancouver's financial plan and 2019 Biennial report, despite handling only ¼ of the region's solid waste, the Burnaby incinerator's operating costs were more than double the cost per tonne of the landfill and emitted more than double the GHGs per tonne of the landfill.

¹⁸ Moore, J. & Hallsworth, C. (2018). ecocity Footprint Tool -Pilot Project Results Webinar. Accessed at <https://static1.squarespace.com/static/5ba7f601a09a7e3943945c4e/t/5bd28b31a4222fa1ffa274d3/1540524851172/Tool+Results+Webinar.pdf>.

¹⁹ Stolaroff, J. (2009). Products, Packaging and US Greenhouse Gas Emissions. Accessed at https://www.researchgate.net/publication/237808802_Products_Packaging_and_US_Greenhouse_Gas_Emissions#pf5.

Figure 4 Global Protocol for Community Emissions (GPC) versus Consumption-Based Emissions Inventory (CBEI) versus Ecological Footprint



Because these upstream emissions are not counted in the current scope of the local government reporting, they are usually ignored and so both climate action and solid waste plans often do not include strategies to address them. They still exist however, and a study for the C40 Cities suggested “urban consumptions-based emissions must be cut by at least 50% by 2030 to maintain the possibility of keeping global temperature rise below 1.5 C.”²⁰ Of the cities examined for that study, 85% of the emissions associated with goods and services consumed within their boundaries are imported from elsewhere. This same report goes on to advocate for ambitious action in the next ten years, noting the need for high income urban areas to reduce the climate impact of consumption by 2/3 in the next decade. While each of these studies uses slightly different methodologies and cover different geographies, the bottom line is that consumption of materials, including food, has a GHG impact at each stage of the process from growing or extracting resources to manufacturing to sales to home or business to disposal. By reducing wasteful and unnecessary consumption, GHGs can be reduced more significantly than with a sole focus on waste diversion (recycling or composting) and far, far more than any energy recovery system would. The Closing the Loop report found that aggressive Zero Waste policies could save 6.2 million tonnes of CO₂e by 2040 while creating 7000 new green jobs in BC.²¹ The City of New York’s One NYC 2050 Plan also acknowledges that “carbon neutrality necessitates New York City achieving zero waste.”²² The City of Amsterdam’s Circular Strategy

²⁰ C40 Cities (2019). New Research Shows How Urban Consumption Drives Global Emissions. Accessed at https://www.c40.org/press_releases/new-research-shows-how-urban-consumption-drives-global-emissions.

²¹ Lee, M., Legg, R., Maxwell, S. and Rees, R. (2013). Closing the Loop -Reducing Greenhouse Gas Emissions and Creating Green Jobs Through Zero Waste in BC. Accessed at <https://pics.uvic.ca/sites/default/files/uploads/Closing%20the%20Loop...pdf>.

²² The City of New York (2019). One NYC 2050 Building a Fair and Strong City. Accessed at <http://1w3f31pzvdm485dou3dppkcq.wpengine.netdna-cdn.com/wp-content/uploads/2020/01/OneNYC-2050-Full-Report-1.3.pdf>

notes that a circular economy is needed to stay within planetary boundaries and is part of their path to climate neutrality.²³ They also use doughnut economics²⁴ and recognize the need for social justice.

This realization that consumption drives a significant portion of GHG regardless of where the actual emissions may occur is why many progressive communities are looking at adopting consumption-based emissions inventories to help them better understand their impact and develop suitable strategies. Looking at waste and GHGs with this lens changes the focus from the traditional one: what we discard from our homes, institutions and businesses, to what we choose to consume, how we do that (owning versus sharing, reusable versus disposable), how long we keep the items in use and then how we discard them.

As noted in the Regional Climate Action Strategy,²⁵ which includes a goal to minimize waste generation, there are many co-benefits of climate action and similarly there are also many co-benefits from pursuing Zero Waste which go beyond less waste and GHGs.

The Ministry's guidelines for solid waste planning recommend that plans address the climate impacts of waste. According to the CRD website,²⁶ "in February 2019, the Capital Regional District (CRD) Board identified Climate Action & Environmental Stewardship as a priority for the region and approved a motion to declare a climate emergency... The CRD is developing and implementing strategies to address this issue." A strengthened Solid Waste Management Plan could be one of those strategies.

Finally, it is important to acknowledge that while GHGs alter the global climate, the impacts can be seen locally, here in BC experienced as increased forest fires and smoke, altered rainfall patterns (droughts and floods) and loss of species, which will have knock-on effects and costs to many communities and businesses. It is through our collective global action to reduce the GHG emissions that the local impacts can be minimized.

3 REVIEW OF DRAFT PLAN

The draft SWMP was reviewed through the lens of Zero Waste and using the Zero Waste Hierarchy. Each level of the hierarchy is noted below as well as the plan direction and supporting systems.

3.1 Plan Direction

The plan adopts and strengthens the guiding principles (including Zero Waste and the Circular Economy) that are recommended by the Ministry.²⁷

²³ Municipality of Amsterdam (2020). Amsterdam Circular 2020 -2025 Strategy. Accessed at http://carbonneutralcities.org/wp-content/uploads/2020/06/Amsterdam-Circular-2020-2025_Strategy_HighRes.pdf.

²⁴ Doughnut economics aims to have an economy that is within the ecological boundaries of the planet while providing the basic needs of its citizens (social boundaries).

²⁵ CRD Regional Climate Strategy (2017). Accessed at https://www.crd.bc.ca/docs/default-source/crd-document-library/plans-reports/climate/2017-04-12_regionalclimateactionstrategy_final.pdf?sfvrsn=da2e32ca_18.

²⁶ CRD (2019). Climate Action webpage. Accessed at <https://www.crd.bc.ca/project/climate-action>.

²⁷ BC Ministry of Environment (2016). A Guide to Solid Waste Management Planning. Accessed at <https://www2.gov.bc.ca/assets/gov/environment/waste-management/garbage/swmp.pdf>.

The goals for the plan are to:

1. To surpass the provincial per capita waste disposal target and aspire to achieve a disposal rate of 125 kg/capita/year.
2. To extend the life of Hartland Landfill to the year 2100 plus.
3. To have informed citizens that participate effectively in proper waste management practices.
4. To ensure that the CRD's solid waste services are financially sustainable.

As the preface of this section states these are aspirational, these goals could be far more inspiring. The guiding principles include a Zero Waste approach and so the aspirational target should be Zero Waste, rather than 125 kg/capita/year. If that goal is seriously pursued then the lifespan of the Hartland Landfill could be greatly extended and its role could be more as a hub for materials, research and education than for waste disposal. The role of citizens in a Zero Waste and circular economy system should be more than as correct sorters of materials, but instead as active participants developing a vibrant circular economy that minimizes material throughput and environmental harms while maximizing local benefits. Businesses, institutions and other sectors should also be actively engaged. It is appropriate to ensure the long-term financial stability of the solid waste services.

The plan uses the pollution prevention hierarchy which covers many of the same aspects as the Zero Waste Hierarchy but misses the top level where the systemic rethink and redesign considerations are included. The pollution prevention hierarchy includes energy recovery as acceptable (unlike the Zero Waste one and places it above residual management).

From a starting point of 382 kg/capita in 2019, targets for the per capita disposal rate are set at 340 kg or less for the third year, 285 kg for the fifth year and 250 kg for the tenth year. It also should be noted that the CRD has been close to the provincial target of 350 kg/capita for two of the past five years and so while this may be a stretch target for some regions, it may not be rigorous enough for others including the CRD.

The importance of stretch goals can be seen from history. In 1989, BC set a goal to reduce the average per capita disposal rate by 50% by the year 2000.²⁸ During those years, waste disposal per capita in the CRD fell from 654 kg/capita to 399 kg/capita. The target of 327 kg was not reached but the drop was significant. Since then the per capita number has fluctuated between 352 and 454.

In comparison, the City of Victoria has a target of 50% less waste disposed by 2040 and fully circular by 2050.²⁹ Victoria represents 1/3 of the waste going to the Hartland Landfill. The C40 Cities has a Zero Waste Declaration (to which Vancouver is a signatory) which sets a goal of 50% less waste disposed by 2030 (compared to 2015).³⁰ The equivalent for the CRD would be 172 kg/capita. The C40 Declaration also sets targets for waste generation (as in all materials discarded which includes waste, recycling and organics) to be 15% less and for diversion to increase to 70% by 2030. The cities commit to biannual public reporting. While the CRD draft plan does not show the diversion rate, Figure 1 of Zero Waste Victoria shows that its diversion rate is 51%.³¹ The Regional District of Nanaimo (RDN)

²⁸ Government of Canada (2006). An Analysis of Resource Recovery Opportunities in Canada and the Projection of Greenhouse Gas Emission Implications. Accessed at <https://www.rcbc.ca/files/u3/RR-opport-data-report.pdf>.

²⁹ City of Victoria (2020). Zero Waste Victoria. Accessed at <https://www.victoria.ca/EN/main/residents/climate-change/waste-reduction.html>.

³⁰ C40 Cities (n.d). Advancing Towards Zero Waste Declaration. Accessed at <https://www.c40.org/other/zero-waste-declaration>.

³¹ Same as footnote 28

had comparable waste per capita to the CRD (347 kg in 2014 -RDN to 369 kg for the CRD) and yet their target is far more aggressive at 109 kg by 2027.³²

Recommendations:

- Adopt Zero Waste as the goal and engage all sectors of society in pursuing this.
- Adopt the Zero Waste Hierarchy as a guide.
- Adopt stronger targets (similar to the Regional District of Nanaimo).
- Gather information and add targets for reduced waste generation and waste diversion that at least match the C40 Zero Waste Declaration.

3.2 Rethink/Reconsider

Under the rethink/reconsider level of the hierarchy, the CRD draft plan includes some good measures. Developing and implementing a purchasing policy can encourage production of products made from reused, recycled or sustainably-harvested renewable, non-toxic materials and products that are durable, repairable, reusable, fully recyclable or compostable, and easily disassembled. The purchasing policy could also improve the market for the finished compost material. This should be developed in partnership with member municipalities as noted but also regional districts, universities, the provincial government, and institutions to maximize the impact. The CRD could join the [Canadian Collaboration for Sustainable Procurement](#) to maximize the impact and reduce the work involved in research. An annual report back to the Board as happens for the City of Vancouver is recommended. Incentives are another key component and the plan includes a fund for waste reduction (action 2B) and Pay As You Throw (PAYT) for tipping fees. A key one needed is to have higher tipping fees (more on tipping fees in section 4), ideally matching the CVRD fees to prevent waste migration and provide stronger disincentive to wasting. Additional fees will help to fund programs. The CRD has differential fees (free for recycling and Household Hazardous Waste (and lower for yard waste than garbage)³³ however the charge for kitchen scraps is higher than for waste which would encourage putting kitchen scraps in the waste. In addition, there is no surcharge or penalty for mixed waste loads such as for the Sunshine Coast, Whistler and Squamish, where fees may be double if the waste has a significant amount of banned materials (including recyclables and organics). The Regional District of Kootenay Boundary charges five times the tipping fee for loads with banned recyclable materials.³⁴ In addition to PAYT at the landfill, the CRD should work with member municipalities to have PAYT at the curb and elsewhere that makes it progressively more expensive by weight or volume to waste.

Other areas that need addressing for fees are for tires and unsecured loads. The fees for rimmed tires may be a disincentive. Work should be done with Tire Stewardship BC and the Ministry to ensure that the Extended Producer Responsibility (EPR) program is covering all costs associated with their products including the handling of rimmed tires so that the landfill does not need to charge fees to the end user. Unsecured loads can create litter enroute to the disposal facilities. One way to prevent this is to charge an additional fee for loads arriving unsecured as is done by many other regional districts.

³² Regional District of Nanaimo (2018). Regional District of Nanaimo: Solid Waste Management Plan -Planning for the Future of Our Waste -Road to 90% Waste Diversion. Accessed at https://www.rdn.bc.ca/sites/default/files/inline-files/2018%20SWMP%20Amendment_1.pdf.

³³ CRD (2020). User Guide Hartland Depot. Accessed at https://www.crd.bc.ca/docs/default-source/recycling-waste-pdf/hartlanduserguide.pdf?sfvrsn=88e2c3ca_8.

³⁴ Regional District of Kootenay Boundary (n.d.). Garbage, Compost & Recycle. Accessed at <https://rdkb.com/Utilities-Waste/Garbage-Compost-Recycle/Landfill#mckelvey>.

In 3.8 Residual Management, the need for understanding what remains in the waste will be highlighted but this information should feed back into systems change. Items that are not recyclable nor compostable need to be identified and this feedback needs to inform the federal and provincial directions for what materials may need to be phased out or regulated into an EPR program.

This plan can help to increase the local economy, through procurement policy and fostering local businesses that reduce waste. The plan could include actions to measure and promote this. For example, the Vancouver Economic Commission reports on the green local jobs created through the Greenest City Action Plan.³⁵ There could also be a specific working group to develop the Local Circular Economy that goes beyond Plan Monitoring Advisory Committee members and engages citizens, businesses, academia and others to develop Zero Waste businesses beyond what the CRD already has. The CRD is well-placed to do this given that there is a wealth of expertise (the University of Victoria and the Provincial Government is within its boundaries), there are numerous environmental non-governmental groups like One Planet Saanich, and that there are already a host of Zero Waste businesses in place.³⁶ It is key to get the mindset of citizens and businesses to change. This can come from education programs, bans on single use and commonly wasted items, and be part of solutions designed to encourage people to consume less.

Leading by example is another key strategy. Leadership can be demonstrated through in-house programs such as employee education; increased use of electronic documents; double-sided copying and printing and only when necessary; decreased use of non- recyclable paper; use of cloth towels or electric hand dryers in rest rooms; and where packaging is required in food operations, using only reusable and recyclable containers. Use of standard signage and bins in appropriate collection areas can also decrease the corporate waste.

Recommendations

- Increase tipping fees to align with neighbouring regional districts, ensure kitchen scraps are at a lower fee than the waste and add a mixed waste fee at double or more the regular waste tipping fee to encourage waste diversion.
- Work to address fees on rimmed tires.
- Add a fee for unsecured loads.
- Add an action to promote the local circular economy potential.
- Develop a program for the CRD corporate entity to model Zero Waste actions.
- Join the Canadian Collaboration for Sustainable Procurement.
- Have the CRD lead by example.
- Work with federal and provincial government on policies to reduce material throughput and waste.

3.3 Reduce

Strategy #1 Continue and Enhance Education Programs

Reduction is critical area for change and source reduction and the elimination of problematic materials should be the main focus. Reducing the materials at the source can then be supported by behaviour change components, not just incorporated but as the key driver for new and existing programs. The expansion of education to multifamily and ICI sectors is good as is expanding the K-12 programs to include the circular economy. While supporting

³⁵ Vancouver Economic Commission (2018). Green Economy. Accessed at <https://www.vancouvereconomic.com/focus/green-economy/>.

³⁶ Project Zero (2020). Accessed at <https://www.project-zero.ca/resources>.

environmental stewardship recognition is noted, it should include awards, labelling, accreditation and other forms of public recognition. In addition to the actions already listed, these could be added as well:

- Partner with other jurisdictions to share materials (for example, consider rolling out Think Thrice -Metro Vancouver's textiles campaign).
- Create targeted behaviour change campaigns based on the needs shown in the waste composition studies.
- Monitor results with ongoing waste audits and modify campaigns based on the feedback.
- Consider partnering with other organizations (not just product stewards): environmental groups, universities, the Ministry, and others to test out pilot programs. Share the results with other jurisdictions.
- Instead of just engaging residents on solid waste matters, work to promote the Zero Waste concept and increase avoidance of waste-generating materials and products, and diversion for all residents and businesses. Help citizens to understand the environmental footprint of their purchases and how to evaluate different options.
- Consider a waste or sustainability-focused newsletter like the Regional District of Nanaimo and City of Vancouver have.
- Foster and promote the refill, reuse, sharing, rental, and repair businesses in the region.
- Enhance and encourage more repair cafes such as those in Sooke, Fairfield and North Saanich.
- Conduct a toxics reduction campaign to reduce the amount of hazardous materials used.

Strategy #2 Encourage Waste Prevention

The actions in this strategy are also key for waste reduction and include promoting reduced consumption and consumer responsibility, supporting single-use item reduction efforts, promoting better packaging options and advocacy. These actions are sound but it is unclear how extensive they will be or not. Additional actions could include :

- Ensuring access to drinking water instead of bottled water by mapping it out as [Metro Vancouver](#) has done
- Developing a regional reusable cup share programs as the [City of Freiburg](#) has and use the same model for takeout containers.
- Working with local partners to develop and promote sharing services such as for reusable mug and takeout containers as well as other services.
- Work to reduce waste at the source and eliminate problematic materials including bans where possible.
- Collaborating with other local governments (and non-governmental organizations) to increase the efficacy of the advocacy to higher levels of government.
- Develop a plastic reduction strategy to reduce the use of plastics, plastic waste and microplastics. Collaborate with other governments as well as businesses. The next ten years will be a critical time for this.
- Developing a program to encourage renovation of buildings over demolition.

Strategy #3 Support Reduction of Avoidable Food Waste

A strategy addressing food waste is sound and could be strengthened by setting a food waste reduction target. The actions to support residential and ICI food waste reduction, and food recovery organizations, as well as advocating for clarity and education on best before dates are suitable but the degree of action is unclear.

Given the large percentage of single family homes and the amount of kitchen scraps and yard waste generated, consideration should be given to:

- Continue with the Love Food Hate Waste program but strengthen its implementation.

- Work with partner organizations to decrease food waste.
- Develop a program to increase wildlife-friendly backyard composting. This is considered reduction as the material does not need to be collected nor transported and it can replenish the nutrients in the gardens.
- Grasscycling and xeriscaping can also be encouraged to reduce the amount of yard waste.

3.4 Reuse

Strategy # 4 Support Reuse Activities in the Region

This strategy has actions to continue support for reuse organizations; support of rental, reuse and sharing programs; and investigating free stores at facilities. Other actions should include:

- Develop a sharing economy strategy that identifies the top priorities³⁷ could result in the option to borrow a wide-range of items like York Region's [Lendary](#). Support local sharing systems or set up ones to fill in the gaps (bikes, tools, cars, toys, kitchen gadgets).
- Hosting a [ReBuild it Centre](#) at Hartland.
- Mapping out local resources for sharing, rental, reuse, and repair. See [Portland](#) as an example.
- Hosting or supporting local repair cafes like in [Metro Vancouver](#).
- Set reuse/refill targets across CRD buildings/spaces and invest in infrastructure for this.
- Support reusable diapers systems as household hygiene is a significant waste segment.
- Advocate for the Right to Repair, mandatory warranties, time frames for parts availability, requirements for online manuals, and plans for components
- Advocate for EPR programs to be responsible for supporting repair and reuse of their products (where suitable).
- Ask for federal and provincial investment in reuse, repair, refill, etc. and circular systems for scaling local initiatives.
- Incentivize house moving and construction material reuse through regulatory strategies, enforcing limits on waste generation and expanding environmental obligations. This should be done in partnership with member municipalities.

3.5 Recycle

Table A of the Waste Composition study³⁸ (which is a more detailed look at the data in Figure 4.2 of the draft plan) shows that over 50% of the waste is comprised of materials that are banned or could be recycled. This highlights the needs for more education and enforcement of the bans. Products and packaging covered under the Canadian Council of Ministers of the Environment Canada-wide Action Plan for Extended Producer Responsibility³⁹ represent 61% of the waste and highlights the need for the Ministry to follow through on its 2009 commitment to require producer responsibility systems for Institutional, Commercial and Industrial (ICI) Packaging and Printed Paper (PPP); textiles and carpet; furniture; and construction and demolition materials (though the target date was 2017). The Ministry took a step towards parts of this with its recent Discussion Paper but the CRD must continue to play a strong role in pushing for complete and speedy delivery of the Canada-wide Action Plan.

³⁷ One Earth (2015). Local Governments and the Sharing Economy. Accessed at http://www.localgovsharingecon.com/uploads/2/1/3/3/21333498/localgovsharingecon_report_full_oct2015.pdf.

³⁸ Tetrattech (2016). 2016 Solid Waste Stream Composition Study. Accessed at https://www.crd.bc.ca/docs/default-source/recycling-waste-pdf/WasteCompositionStudy2016.pdf?sfvrsn=baab36ca_4.

³⁹ Canadian Council of Ministers of the Environment (2009). Canada-wide Action Plan for Extended Producer Responsibility. Accessed at https://www.ccme.ca/files/current_priorities/waste/pn_1499_epr_cap_e.pdf.

Many of the strategies in the CRD draft plan relate to recycling for different waste generating sectors (residential - single family and multifamily; ICI; construction and demolition; and public spaces). They are noted here along with ways to enhance the plan.

Strategy #7 Increase Residential Diversion

Actions for this strategy include promoting diversion, working with service providers to support depot diversion, encouraging local processing and markets and developing tools for event recycling. Additions could include:

- For events, the CRD should work with member municipalities to require zero waste plans to be part of event permitting process.
- The grey box system for glass collection, such as the City of Vancouver uses, should be examined to see if this could increase diversion.
- Work with service providers to do more checks, education and enforcement of disposal bans at point of collection.

Strategy #8 Increase Multi Family Diversion

Actions include supporting diversion through education, working with partners to develop source separation requirements, developing a policy guide and collaborating with stakeholders to support recycling. These are all suitable and good examples exist elsewhere that can be used.

- A review should be done to make sure the Recycle BC program covers all the appropriate multifamily buildings in the CRD.

Strategy #9 Increase ICI Diversion

Actions include providing resources such as a business waste reduction liaison, advocating EPR for ICI packaging and paper, creating a toolkit, encouraging municipalities to require waste management plans with business licenses, developing policy for ICI space and access requirements, working with partners on source separation requirements and investigating disposal ban enforcement of generators. These are all suitable and good examples exist elsewhere that can be used.

Strategy #10 Support Existing and New EPR Programs

These actions are to advocate for expanded EPR programs, standardized programs and return-to-retail opportunities. It also looks to work with the stewards to increase consumer awareness of programs. Advocacy is the main element for this and the CRD can also:

- Work to ensure that the EPR programs are fully delivering on their obligations including doing more on the first levels of the hierarchy.
- Ask that the Province meet its commitments to the Canada-wide Action Plan for EPR in a timely fashion.
- Work with other local governments to ensure the programs are as effective as possible and that local governments have a voice in program delivery and plans.

Strategy 12# Increase Construction, Renovation and Demolition Material Diversion

The actions include a clean wood waste ban and looking at surcharges for mixed waste loads along with programs for hazardous materials. In addition to this, the CRD could:

- Develop a Construction and Demolition materials hub at Hartland (as the City of Vancouver is investigating).
- Form a Construction and Demolition working group to determine best practices
- Require deconstruction not demolition (building on [Metro Vancouver's model bylaw](#)).
- Charge a waste levy on materials to drive diversion and track data.
- Ask the provincial government to work towards a building code that incorporates future deconstruction needs and factors in embodied carbon and to create a deconstruction step code.
- Work with province to include design guidelines in Building Code to ensure adequate space for waste sorting in new developments (both in unit and in building). [Whistler](#) is an example of a jurisdiction that has worked with existing buildings.

Strategy #13 Encourage Proper Public Space Waste Management Activities

The actions include developing educational materials, promoting alternatives to illegal dumping, developing a regional approach to prevention and bylaws, work on reporting systems and investigate large bulky item disposal. Other actions should include:

- For bulky disposal, the CRD should advocate for the promised EPR programs for furniture, mattresses and carpet and ensure that programs for bulky items have a pickup component.
- The CRD asking that the Recycle BC program is required by the Ministry to deliver service in public spaces as noted in the Recycling Regulation.

Additional Recommendations:

- Developing common regional signage to assist in correct sorting of materials. This should be done in conjunction with member municipalities, businesses and EPR programs. An example of this has been done by the [Squamish-Lillooet Regional District](#).
- Banning materials before EPR programs exist. For example, Metro Vancouver have banned mattresses from their facilities and this ensures materials for the mattress recycling businesses that have arisen.
- Working with service providers to provide biweekly service for curbside garbage collection and weekly service for organics pickup. This has proven to reduce waste in other regions.⁴⁰
- Targeting funding towards recycling materials that are not currently recycled by encouraging non-profit and private sector innovation such as in the RDN's plan.
- Educate around and enforce the bans. Feedback at each step of the process (at collection, at transfer and at the landfill) is essential to help educate waste generators on how to reduce their waste. This will require partnership with other organizations that deliver these waste collection and management services. This could require friendly waste educators monitoring collection runs and cameras on waste trucks checking each tip.

3.6 Compost

The 2016 Waste Composition study⁴¹ (Table A, page 2) shows that 10% of the total waste was avoidable food waste and another 1.6% was of donatable quality. Another 7% was the type of material that could have been composted in backyard composters. These components are 18.6% of the waste compared to all organics at 21.1% of the waste stream. This shows that a strong focus on food waste prevention and a program to encourage backyard composting could significantly reduce the amount of organics that need to be collected and processed.

⁴⁰ Clean 50 (n.d). City of Surrey -Rethink Waste!. Accessed at <https://clean50.com/projects/city-of-surrey-rethink-waste/>.

⁴¹ Tetrattech (2016). 2016 Solid Waste Stream Composition Study. Accessed at https://www.crd.bc.ca/docs/default-source/recycling-waste-pdf/WasteCompositionStudy2016.pdf?sfvrsn=baab36ca_4.

This could reduce the costs for that infrastructure. It also highlights the risk in relying on the energy from organic material if the infrastructure is not scaled appropriately. The goal of composting should be high grade compost to support regenerative agriculture. This not only reduces waste but can help to support food security and resilience.

Strategy #11 Increase Organics Diversion and Processing Capacity

This strategy addresses some of the present issues and has actions to promote diversion, develop a processing facility, support compost markets and to develop guidelines for use of compostable products and packaging.

Recommendations:

- Consider also decentralized composting for high generation areas.
- Processing for the rest scaled to consider the reduction through reduced food waste and backyard composting.
- Education and enforcement for bans.
- Identify and develop other end market.

3.7 Recovery

While no specific strategies were in the plan under recovery, further work to reduce the use of hazardous materials and increase the coverage of hazardous materials under EPR programs should be done.

3.8 Residual management

Two strategies were noted under residual management. The Zero Waste Hierarchy recommends using existing landfills and managing them well (using best practices for gas, leachate, monitoring, etc.). This plan follows these recommendations.

Strategy #14 Optimize Landfill Gas Management

Capturing landfill gas helps to reduce the impacts of past mistakes (putting organics in the waste) but no system captures all of the emissions and there is still a loss of nutrients from the soil. There is also a risk that the drive to capture landfill gas takes precedence over the more beneficial reduction of organic waste and composting what remains. Caveats on this strategy are to ensure that the need to fulfill the contract with Fortis does not conflict with organics reduction strategies and that food waste prevention, back yard composting, support of practices to decrease yard waste, and other strategies higher up the hierarchy take precedence over the production of landfill gas. Ensure the systems are scaled appropriately to the intended volume of organic materials, not the current level.

Strategy #15 Enhance Hartland Disposal Capacity

The actions include reviewing ban enforcement levels (subject to recycling market conditions), use best practices at the landfill, develop design options to maximize capacity and conduct research into emerging technologies. One of the key ways to preserve capacity is to increase ban enforcement levels (not just review them) and to add new bans. As much of the material could be diverted already, strengthening this system along the disposal chain will be key. The CRD is to be commended for planning ahead but given that this plan is for ten years with an effectiveness review at five years, it may be premature to be developing additional capacity, especially when capacity can last longer through more aggressive Zero Waste policies. Phase 2 is expected to last until 2045 but this can be greatly

extended it by adopting the recommendations above. The less waste produced and the longer the existing landfill space can last, the lower the impact on the surrounding area.

Consider the waste that remains as a key source of information on the effectiveness of the plan's actions. This information should be used to then add or adjust actions or continue what is effective. This information should be used to tweak these programs, develop new ones or to share with higher levels of government and other stakeholders so that they can make appropriate changes as well. It can also be used to provide feedback to other entities. For example, the Zero Waste Research Center in Capannori found that the coffee pods were a problematic material so they worked with the producer to find a biodegradable solution.⁴² EPR programs also have an interest in understanding the effectiveness of their programs so partnerships should include their support for waste composition studies, for which the data should be made public. It is also important to understand, gather data on, and ensure the same standards are met for waste flowing to outside the region. Victoria's Zero Waste plan also notes the need for improved regional waste flow data disclosure.

Recommendations

- Conduct regular waste audits and biannual waste composition studies. Work with EPR programs to have them pay for their share of waste composition studies. Make the data public. Make changes based on results.
- Understand and restrict waste flows outside of the region.
- Delay work on landfill expansion and pursue Zero Waste actions instead.
- Mandate clear bags for waste as soon as possible.
- Ensure the public is aware of the progress (or not to date) through publishing the annual report along with advertising and creative means such as a waste thermometer at the landfill.

3.9 Unacceptable

The Zero Waste hierarchy does not promote burning of waste. Backyard burning is noted as a debris management option but an analysis should be done to see if this material is suited for the organics management facility as such facilities may be short of chipped wood.

The CRD is also to be commended for not pursuing thermal technologies for waste destruction in this plan however the plan does mention investigating emerging technologies. While it is unclear what the scope of these technologies may be, it is important to note some examples from other regional districts where they have been clearer in their opposition to waste-to-energy technologies. The Squamish-Lillooet Regional District Solid Waste and Resource Management Plan states that thermal treatment of mixed waste is excluded from consideration for future management of residual waste.⁴³ The Fraser Valley Regional District notes in its plan that it “does not support the use or inclusion of incineration as a method of “recovery” and goes on to outline that the rationale is because it still requires landfilling, produces toxic residuals and air emissions, produces GHGs, wastes energy and natural resources, creates a demand for waste, imposes long-term financial burdens on local government and there are safer, smarter ways to manage non-recyclable material.⁴⁴ The RDN notes it will “continue to review and

⁴² Zero Waste Europe Cities state of ZW (2020). https://zerowastecities.eu/wp-content/uploads/2020/12/zwe_report_state-of-zero-waste-municipalities-2020_en.pdf.

⁴³ Squamish-Lillooet Regional District (2016). SLRD Solid Waste and Resource Management Plan. Accessed at <https://www.slrld.bc.ca/sites/default/files/pdfs/UES/recycling-composting-solidwaste/SWRMP/SLRD%20SWRMP%202016-03-16.pdf>.

⁴⁴ Fraser Valley Regional District (2015). Solid Waste Management Plan Update 2016-2026. Accessed at <https://www.fvrd.ca/assets/Services/Documents/Garbage/SWMP.pdf>.

consider alternative technologies that are consistent with the Zero Waste Hierarchy and goal.”⁴⁵ The Sunshine Coast Regional District adopted the Zero Waste Definition and a report noted that waste incineration would be contrary to their SWMP.⁴⁶

Recommendation:

- Include clear language to prevent the use of destructive thermal technologies for managing waste.

3.10 Supporting Systems

In addition to the hierarchy there are some strategies that provide supporting systems to achieving Zero Waste and for which there are two strategies that would fall under this category.

Strategy # 5 Support Local Governments in Working Towards Zero Waste

This strategy includes actions for developing model language for bylaws, best practices, OCPs and economic development strategies; identifying need and zoning for solid waste facilities; enabling local recycling infrastructure; use of PAYT; and the use of clear bags. The CRD could also:

- Encourage more local governments to follow Victoria’s example and create their own Zero Waste plans, tackle different strategies, and share the results. Collaboratively, local governments working on Zero Waste could engage with senior levels of government to work on road blocks they encounter.
- Work with local governments to encourage or mandate waste audits in the ICI sector.

Strategy # 6 Continue and Enhance Policy Development

This strategy includes model procurement policies, expanding material bans, investigating waste management facility licensing, investigating regulatory mechanisms for material management and looking at options for debris.

There also need to be:

- An inclusion of a requirement to report data with the licensing of waste management service providers and facilities.
- Interregional cooperation -working with other regional districts to share best practices and collaborate on advocacy.
- Membership in the National Zero Waste Council and other entities to foster Zero Waste systems.

Overall there are many sound strategies in this plan but the big question is how far and how quickly will they go. Appendix E of the draft plan shows that many new strategies (such as supporting renting/sharing/reuse programs and increasing residential, multifamily and ICI diversion) will not be implemented until after year 5. The effectiveness of the plan will come down to resources dedicated to implementation. The key will be adequate staff time, scope and financial resources dedicated to solid waste. Frequently, regional districts will develop sound plans and then consistently underfund or ignore them until the next crisis in disposal capacity results. Sound management of solid waste requires early, ample and consistent efforts to minimize waste to preserve the

⁴⁵ See footnote 28.

⁴⁶ Sunshine Coast Regional District (2019). Special Infrastructure Services Committee agenda. Accessed at <https://www.scrd.ca/files/File/Administration/Agendas/2019/2019-JAN-25%20ISC%20Agenda%20Package%20-%20Special.pdf>.

remaining disposal capacity as long as is possible. This remaining capacity should be highly valued and decisions should factor in the ever-increasing costs to replace such an asset. This valuation should drive spending now to delay or prevent those future expenses.

A comparison with the RDN plan shows the difference in costs per capita. The RDN notes the difference between the status quo at 68% diversion to its Zero Waste strategy of 90% diversion was \$10.03. The additional costs for the CRD plan at \$3,245,000 represent \$7.76 per capita.

Other Recommendations:

- Outline what the five-year plan review will include like the RDN plan.
- The climate strategy also notes many outreach programs and campaigns with other partners -the same needs to happen for the SWMP.
- Value the remaining landfill space.
- Increase funding and staff time to support this plan to ensure it can achieve higher targets.

4 FUNDING

Funding the plan adequately is important. The source of funds can come from tipping fees, grants, revenue from landfill gas and payments from EPR programs. It can also be funded through utility fees and taxes as many utilities are.

It is important to understand the multiple roles of tipping fees. The first is to fund the solid waste services. A high tipping fee with lower fees for source separated materials like yard and garden waste, food scraps and recyclables (also known as variable tipping fees) can be a strong incentive to recycle and compost rather than waste. Consideration of tipping fees in nearby regions is also important to avoid waste migration. Setting tipping fees lower than neighbouring districts can result in waste coming into the region. There are also some concerns that a very high tipping fee may result in illegal dumping but there are many factors that contribute to illegal dumping and the fees are not always the key driver. Tipping fees also need to continually increase both to maintain the level of incentive and to fund the system. Appendix F includes estimates of future financial requirements and revenue but appears to assume the tipping fees would remain static for ten years.

There are other sources of revenue as well. As more products and packaging are covered by EPR programs, the CRD should ensure that it is fairly compensated for services it provides to these programs and should work in collaboration with other regional districts through the BC Product Stewardship Council to ensure that local governments are also compensated for the materials that end up in the waste stream despite the programs. There is mention in the plan of developing markets for the finished compost material which could also provide revenue. The RDN is proposing a disposal levy to offset the regional district's fixed costs of solid waste system (particularly for materials shipped out of the region) with a discounted tipping fee offered to licensed haulers. In some cases, there are grants available such as the ones recently offered for organics management facilities by the provincial and federal governments. Fines may be another revenue source but not one that should be relied upon.

When regions pursue Zero Waste in a system funded mainly through tipping fees, there can be concerns that success will mean that there is inadequate income to fund the fixed costs of the solid waste system. To avoid the conflict between a goal of Zero Waste and an adequately funded system it is important to include a mix of funding sources that is adjusted as the waste is reduced. Some funds should come from property taxes and utility fees to ensure that there is a source of stable funding. These can start at a low level and can increase as the amount of waste decreases but initially the tipping fees need to be similar to neighbouring regions and high enough to

encourage waste diversion. If the revenue is higher than expected due to more waste than intended, these additional funds should be put towards additional programs to address the problem areas.

Looking at Zero Waste more broadly, the CRD can also encourage grants from other funding parties to local organizations to support Zero Waste and create a hub in the region.

Recommendations:

- Fund part of the solid waste system through property taxes and utility fees.
- Raise tipping fees to match the CVRD rates.
- Adjust funding sources as waste levels change.
- Consider a levy and discount system similar to the RDNs.
- Ensure EPR programs pay their way.
- Apply for grants and support other local partners applications as well.
- Ensure fines are applied after education measures and that they are sufficient to change behaviour.

5 SUMMARY

In general, the plan has many good strategies but a lot of them are to “investigate” possible actions rather than a firm commitment to enact them by a certain date. The plan also relies on existing staff to a fair degree to enact them. A stronger plan would have Zero Waste as the strong consensual vision and more aggressive interim targets, a commitment to the strategies listed as well as others recommended above and significantly more funding directed to achieving this vision. Rather than a focus on the need to expand the landfill, the emphasis must be on engaging the whole CRD community with broad and engaging partnerships to preserve existing space as long as possible, with regular community updates on progress, public annual reports and using the five year plan effectiveness review intervals as critical decision points to galvanize further actions if the new targets are not achieved. The degree to which these strategies will be effective will depend on the resources put towards them and the commitment to achieving Zero Waste.

APPENDIX A ZERO WASTE HIERARCHY

Zero Waste Hierarchy of Highest and Best Use 7.1

Purpose

The Zero Waste Hierarchy describes a progression of policies and strategies to support the Zero Waste system, from highest and best to lowest use of materials. It is designed to be applicable to all audiences, from policy-makers to industry and the individual. It aims to provide more depth to the internationally recognized 3Rs (Reduce, Reuse, Recycle); to encourage policy, activity and investment at the top of the hierarchy; and to provide a guide for those who wish to develop systems or products that move us closer to Zero Waste. It enhances the Zero Waste definition by providing guidance for planning and a way to evaluate proposed solutions.

Zero Waste Definition

Zero Waste: The Conservation of all resources by means of responsible production, consumption, reuse, and recovery of all products, packaging, and materials without burning them and without discharges to land, water, or air that threaten the environment or human health.

Guiding Questions

| | |
|-----------------------------|---|
| Rethink/Redesign | What has led us to our present linear use of materials and thus, what needs to evolve to move towards a closed loop model? How do we re-design systems to avoid needless and/or wasteful consumption? |
| Reduce | What supports the use of less material and less toxic material? |
| Reuse | What supports the better use of those products we already have in ways that retain the value, usefulness and function? |
| Recycle/Compost | How do we ensure materials are put back in the materials cycle? |
| Material Recovery | What was salvaged from mixed waste? |
| Residuals Management | What is still left and why? What do we need to take out of the system that should not have been circulated in the first place? How do we manage what is left in a flexible manner that continues to encourage movement towards Zero Waste? |
| Unacceptable | What systems and policies encourage wasting and should not occur? |

***Guiding Principles**

| | |
|--------------------------------------|---|
| Closed Loop Systems | Design systems to be closed loop rather than linear in their use of resources |
| Close to Source | Processes to occur as close to the source as practical |
| Conservation of Energy | More energy can be saved, and global warming impacts decreased, by reducing waste, reusing products, recycling and composting than can be produced from burning discards or recovering landfill gases. ¹ |
| Do Not Export Harm | Avoid the export of toxic or potentially toxic waste or materials, as well as materials with limited or undefined recycling markets that will be landfilled or incinerated in other regions. |
| Engage the Community | Promote changes and systems that work with communities to facilitate meaningful and sustained participation, increase understanding, and influence behaviour change and perceptions |
| Highest and Best Use | Creating and keeping materials and products for a use as high on the hierarchy as possible and in the useful loop as long as possible. Keeping materials from being downcycled where the number of future uses or options are limited. Source separate items and materials to the extent necessary to ensure clean and marketable products and materials for reuse, recycling and composting streams. |
| Information & Improvement | Collect information on systems and use as feedback for continuous improvement |
| Local Economies | Support the growth and expansion of local economies (production, repair, and processing) in order to reduce greenhouse gases from transportation, improve accountability, and increase repair and parts opportunities |
| Materials Are Resources | Preserve materials for continued use and use existing materials before harvesting virgin natural resources |
| Minimize Discharges | Minimize all discharges to land, water or air that threaten the environment, or human health, including climate changing gases |
| Opportunity Costs | Consider opportunity costs of investments and ensure investments occur as high as possible on the Hierarchy |
| Precautionary Principle | Ensure that a substance or activity which poses a threat to the environment is prevented from adversely affecting the environment, even if there is no conclusive scientific proof linking that particular substance or activity to environmental damage |
| Polluter Pays | Whoever causes environmental degradation or resource depletion should bear the “full cost” to encourage industries to internalize environmental cost and reflect them in the prices of the products |
| Sustainable Systems | Develop systems to be adaptable, flexible, scalable, resilient, and appropriate to local ecosystem limits |

¹ Source: <http://zwia.org/standards/zw-community-principles/>,

Zero Waste Hierarchy

| | | |
|----|-------------------------|---|
| 1 | Rethink/Redesign | Design and purchase products from reused, recycled or sustainably-harvested renewable, non-toxic materials to be durable, repairable, reusable, fully recyclable or compostable, and easily disassembled |
| 2 | | Shift funds and financial incentives to support a Circular Economy** over the harvesting and use of virgin natural resources |
| 3 | | Enact new incentives for cyclical use of materials, and disincentives for wasting |
| 4 | | Facilitate change in how end users' needs are met from "ownership" of goods to "shared" goods and provision of services |
| 5 | | Support and expand systems where product manufacturing considers the full life-cycle of their product in a way that follows the Zero Waste Hierarchy and moves towards more sustainable products and processes. Producers take back their products and packaging in a system that follows the Zero Waste Hierarchy. |
| 6 | | Identify and phase out materials that cause problems for Closed Loop Systems* |
| 7 | | Facilitate and implement policies and systems to encourage and support Local Economies* |
| 8 | | Re-consider purchasing needs and look for alternatives to product ownership |
| 9 | | Provide information to allow for informed decision-making |
| 10 | | Eliminate or avoid systems that drive needless consumption |
| 11 | Reduce | Plan consumption and purchase of perishables to eliminate or avoid discards due to spoilage and non-consumption |
| 12 | | Implement Sustainable Purchasing** that supports social and environmental objectives as well as local markets |
| 13 | | Minimize quantity and toxicity of materials used |
| 14 | | Minimize ecological footprint required for product, product use, and service provision |
| 15 | | Choose products that maximize the usable lifespan and opportunities for continuous reuse |
| 16 | | Choose products that are made from materials that are easily and continuously recycled |
| 17 | | Prioritize the use of edible food for people |
| 18 | | Prioritize the use of edible food for animals |
| 19 | Reuse | Maximize reuse of materials and products |
| 20 | | Maintain, repair or refurbish to retain Value**, usefulness and function |
| 21 | | Remanufacture with disassembled parts; dismantle and conserve "spare" parts for repairing and maintaining products still in use |
| 22 | | Repurpose products for alternative uses |
| 23 | Recycle/Compost | Support and expand systems to keep materials in their original product loop and to protect the full usefulness of the materials |
| 24 | | Maintain diversion systems that allow for the highest and best use of materials, including organics |
| 25 | | Recycle and use materials for as high a purpose as possible |
| 26 | | Develop resilient local markets and uses for collected materials wherever possible |
| 27 | | Provide incentives to create clean flows of compost and recycling feedstock |
| 28 | | Support and expand composting as close to the generator as possible (prioritizing home, on site or local composting) |

| | | |
|----|-----------------------------|--|
| 29 | | Whenever home/decentralized composting is not possible, consider industrial composting, or if local conditions require/allow, anaerobic digestion |
| 30 | Material Recovery | Maximize materials recovery from mixed discards and research purposes after extensive source separation |
| 31 | | Recover energy using only systems that operate at Biological Temperature and Pressure** |
| 32 | Residuals Management | Examine materials that remain and use this information to refine the systems to rethink, reduce, reuse, and recycle in order to prevent further discards |
| 33 | | Ensure minimization of impacts by means of biological stabilization of fermentable materials. |
| 34 | | Encourage the preservation of resources and discourage their Destructive Disposal or dispersal |
| 35 | | Plan systems and infrastructure to be adjusted as discards are reduced and its composition changes |
| 36 | | Minimize Gas Production and Release** and maximize gas collection |
| 37 | | Use existing landfill capacity and maximize its lifespan. Ensure it is Responsibly Managed.** |
| 38 | | Contain and control toxic residuals for responsible management |
| 39 | Unacceptable | Don't support policies and systems that encourage the Destructive Disposal of organics and/or the destruction of recyclables |
| 40 | | Don't support energy and Destructive Disposal systems that are dependent upon the continued production of discards |
| 41 | | Don't allow the Incineration** of discards |
| 42 | | Don't allow toxic residuals into consumer products or building materials |

****Definitions:**

Biological Temperature and Pressure

The ambient temperature and pressure that occurs naturally without the use of added energy, or in any case not above 100 degrees Celsius or 212 degrees Fahrenheit. ²

Circular Economy

An industrial economy that is, by design or intention, restorative and in which material flows are of two types, biological nutrients, designed to re-enter the biosphere safely, and technical nutrients, which are designed to circulate at high quality without entering the biosphere. Materials are consistently reused rather than discharged as waste.

Closed Loop System

A system not relying on matter exchange outside of the system, as opposed to open loop where material may flow in and out of the system.

Destructive Disposal

Discarded materials placed in a landfill or in an Incineration** facility

Diversion

An activity that removes a material from Destructive Disposal.

² Unless higher temperatures are required, not to exceed 150 degrees Celsius, as a pretreatment (e.g. to control diseases, or reduce pathogens) to be then subject to composting or Anaerobic Digestion; the pretreatment should never be used to destroy materials.

Incineration

Incineration is a form of Destructive Disposal via combustion or thermal conversion/treatment of discarded materials into ash/slag, syngas, flue gas, fuel, or heat. Incineration includes facilities and processes that may be stationary or mobile, may recover energy from heat or power and may use single or multiple stages. Some forms of incineration may be described as resource recovery, energy recovery, trash to steam, waste to energy, energy from waste, fluidized bed, catalytic cracking, biomass, steam electric power plant (burning waste), pyrolysis, thermolysis, gasification, plasma arc, thermal depolymerization, refuse derived fuel, or chemical processing of plastics to fuel.

Minimize Gas Production and Release

Keeping out source-separated organics and biologically stabilizing the materials that go into landfill. For existing landfill cells that already contain unstabilized organics, the gas production should be minimized by keeping out rainwater and not recirculating leachate. Minimize methane release by permanently capping closed cells with permanent covers and installing gas collection systems within months of closure (not years). Maintain high suction on collection wells and do not damp down wells or rotate off the wells to stimulate methane production. Filter toxins in the gas into a solid medium that is containerized and stored on site. Note that this is not considered a renewable energy.

Problematic for a Closed Loop System

Materials that make it hard to recycle or compost the materials themselves or other materials. These may be contaminants for a material (like some forms of biodegradable plastics or stickers on fruit and vegetables) or materials that clog processing systems (like plastic bags)

Responsibly Managed Landfills

Manage landfills to minimize discharges to land, water or air that threaten the environment and human health. This must include plans for closure and financial liability.

Sustainable Purchasing

The purchase of goods and services that take into account the economic value (price, quality, availability and functionality) and the related environmental and social impacts of those goods and services at local, regional, and global levels.

Value

The importance, worth, or usefulness of something that may be economic, social, environmental, or sentimental.