



POLICY REPORT

Report Date: April 20, 2018
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TO: Standing Committee on Policy and Strategic Priorities
FROM: General Manager of Engineering Services
SUBJECT: Zero Waste 2040

RECOMMENDATION

- A. THAT Council adopt Zero Waste 2040, as outlined in Appendix A, as a strategic policy framework to guide future decisions regarding the management of solid waste from Vancouver.
- B. THAT Council direct staff to develop interim milestones and plans, supported by business case analysis and viable financial strategy, for implementing Zero Waste 2040, and seek Council approval of programs and projects that require policy change and/or financial commitment that cannot be accommodated in current approved operating and capital budgets.
- C. THAT the General Manager of Engineering Services, in consultation with the Director of Legal Services and Director of Corporate Communications be authorized to enter into a three year partnership agreement with Metro Vancouver Regional District (on behalf of the National Zero Waste Council) for the Love Food Hate Waste (LFHW) Canada Campaign.
- D. THAT Council direct staff to circulate Zero Waste 2040 to the British Columbia Ministry of the Environment & Climate Change Strategy and Metro Vancouver Regional District and take steps to engage those governments as partners in the implementation of the plan.
- E. THAT Council direct staff to develop a Green Operations Zero Waste Plan for City operations, building on the success of the City's existing corporate solid waste diversion program, with scope including zero waste meetings, zero waste and reduced consumption procurement, and waste minimization for all operations, programs and projects.

REPORT SUMMARY

The purpose of this report is to provide an overview of Zero Waste 2040 (Appendix A) and recommend its adoption as a long-term strategic plan (the 'Plan') to guide future decisions relating to solid waste.

Zero Waste 2040 establishes a vision of Vancouver becoming a zero waste community by 2040 and provides a strategic framework to achieve that vision.

The Plan is the result of a two-year process involving research, stakeholder workshops, public engagement, technical analysis, and recommendations provided by an Advisory Panel made up of business, academic, not-for-profit and government representatives.

Zero Waste 2040 is an evolution of the work and success of current City, regional and provincial solid waste policies and programs. It also integrates with various other City strategic plans including Vancouver's Renewable City Strategy, Healthy City Strategy, Food Strategy, Economic Development Strategy, Green Demolition Strategy and a number of the goal areas of the Greenest City Action Plan in addition to Zero Waste.

The Plan will be adjusted and updated as experience and knowledge is gained through continuous learning, as technology advances and markets change, as ideas, behaviours and societal norms evolve, and as new policies, plans and regulations are introduced by other levels of government.

Subsequent to Council's approval of Zero Waste 2040, implementation planning will proceed including, technical, business case and financial analysis, and in some cases, additional consultation and engagement in order to build out the recommended actions in further detail. Programs, projects and policy changes, and associated funding requirements, will be brought to Council for consideration as part of the annual budget process, the capital planning process and/or special approvals, as required.

COUNCIL AUTHORITY/PREVIOUS DECISIONS

On May 31, 2016 Council directed staff to undertake a Zero Waste Strategy that creates a framework to achieve the Greenest City long term goal of zero waste.

In July 2011, Council adopted the Greenest City Action Plan (GCAP) including the goal of zero waste.

In March 2011, Council endorsed the general approach outlined in Metro Vancouver's draft Integrated Solid Waste and Resource Management Plan (ISWRMP), including the strategic approach to solid waste management through reduce, reuse, recycle, recovery, and residual management.

In January 2011, Council adopted 14 Greenest City targets, including a 2020 target to reduce total solid waste disposed to landfill or incinerator by 50% from 2008 levels.

CITY MANAGER'S COMMENTS

With Council's direction and input from residents and stakeholders, staff have developed Zero Waste 2040, a plan for moving the city towards becoming a zero waste community. Moving in this direction increases Vancouver's resiliency to growing demands on limited available waste

disposal facilities, including the Vancouver Landfill, mitigates future risk to Vancouver taxpayers, and supports the management of waste materials as resources.

The Plan recognizes the need for, and supports a transition to, a more circular economy; shifting away from a traditional 'extract-produce-consume-dispose' economy to one in which materials remain in circulation. By de-coupling economic prosperity with the generation of waste, this plan provides an opportunity for innovation and attracting new businesses creating more 'green' and inclusive jobs. In the long term, the implementation of this plan will support the City's vision of becoming the greenest city in the world and make Vancouver a more resilient city in the face of climate change and increasingly scarce and costly resources.

This Plan is unique from other plans in that it recognizes the requirement of tackling such a complex issue as a collective, suggesting a greater emphasis on communication and collaboration between stakeholders. As such, the City is expected to play a stronger supportive and enabling role within the community, expanding beyond its historical role of collecting and transporting materials for processing and waste for disposal.

Lastly, the Plan recognizes Vancouver as a small part of a globally connected system, supporting the City's influence and leadership with regional, provincial, national and even global waste reduction initiatives including those already underway with the Pacific Coast Collaborative, C40 Cities, Solid Waste Association of North America, Carbon Neutral Cities Alliance, and the Ellen MacArthur Foundation's Circular Cities Network, for example.

The City Manager supports the recommendations in this report.

REPORT

Background/Context

In May 2016, Council directed staff to develop a strategy to achieve the City's long term goal of zero waste. Zero Waste 2040 (Appendix A), informed by public, stakeholder and Advisory Panel input, is in response to that direction and will serve as a long-term strategic plan to guide future decisions relating to solid waste originating from all sectors in Vancouver.

Zero Waste 2040 establishes a vision, strategic framework, objectives, and a target of zero waste disposed to landfill and incinerator by 2040. The Plan identifies various community directions and City actions needed for Vancouver to become a zero waste community, with complementary economic, social and environmental benefits.

The Plan builds from existing policy and current waste reduction and recycling initiatives, many of which are in response to Council's 2020 target of reducing waste disposed to landfill and incinerator by half compared to 2008 levels (equivalent to Metro Vancouver's aspiration goal of 80% waste diversion contained in the ISWRMP).

In calculating the 50% by 2020 waste reduction target for Vancouver, it was estimated that new programs would be introduced as follows:

- City program changes would achieve 5% reduction through organics collection;
- Private sector programs for food scraps would achieve 16% reduction;
- Provincial extended producer responsibility (EPR) programs for printed paper and packaging (PPP) and electronic waste (e-waste) would achieve 14% reduction;

- EPR and private sector programs for construction and demolition (C&D) materials would achieve 11% reduction;
- Reuse and niche energy recovery markets would achieve about 4% reduction.

Strategic Analysis

Progress to Date

The proper management of solid waste — garbage, compostable organic materials, recycling, and debris from construction and demolition — is one of the most important core services municipalities provide. Collecting, diverting, disposing and regulating solid waste is crucial for maintaining a clean, healthy and vibrant city, and public expectation for the quality of these services is high.

Over the last decade local governments with leading environmental policy, such as Vancouver, have focused on diverting material away from disposal through increased recycling and the introduction of composting programs. This focus has been in response to increasing demands on limited available waste disposal facilities and growing recognition that wasted materials need to be managed more sustainably.

In Vancouver, this approach has achieved significant results. In 2008, 480,000 tonnes of solid waste from all Vancouver sources went to disposal. By 2016, this total decreased by 109,000 tonnes to 371,000 tonnes — a reduction in waste disposed by about 23% (Figure 1) or almost half-way to the GCAP 2020 target of 50% less waste disposed. In terms of the portion of this total that the City has direct service control over through its collection operations (single family residential), the reduction in material disposed has been even more significant at 44% or about 27,400 tonnes less waste disposed (to 34,750 tonnes) as of 2017.

Figure 1



Figure 1 Notes:

1. Solid waste data is compiled first at the regional level and then at the city level. As a result, Vancouver's data is always about one year behind the reporting period.
2. The slight increase in waste disposed in 2016 compared to 2015 is consistent with what was experienced across the Metro region and is attributed to economic growth.

Much of this success can be attributed to:

- the City's introduction of the green bin program for food scraps collection;
- switching to bi-weekly garbage and weekly organics collection for City serviced one- and two-family homes;

- a ban on the disposal of compostable organics as garbage from all sectors by the City and Metro Vancouver;
- a City by-law requiring all properties to have organics diversion programs in place;
- the introduction of the City's Green Demolition By-law.

For the development of an appropriate GCAP 2020 solid waste reduction target, the composition of waste disposed was analyzed. At that time it was determined that, from a governance perspective, roughly 50% of waste could eventually be managed through existing and future provincial Extended Producer Responsibility (EPR) programs planned under the Canadian Council of Ministers of the Environment (CCME) *2009 Canada-wide Action Plan for Extended Producer Responsibility*. That action plan identified the following materials for inclusion in EPR programs that would be new in British Columbia by 2017:

- Printed paper and packaging (PPP);
- Textiles, carpet and furniture;
- Construction and demolition materials.

With these materials in mind, the 2020 target was established in accordance with the Ministry of Environment's service plan targets to introduce one new EPR program in each CCME category by 2018. With the exception of the current program for PPP from residential sources managed by Recycle BC, to date new provincial EPR programs for the other materials, including PPP from non-residential sources have not been initiated. This delayed progress has contributed to a shortfall in Vancouver's progress towards the 2020 target. The following table summarizes Vancouver's current estimated performance towards the 2020 target, compared to what was originally assumed.

Zero Waste program areas identified in GCAP	Estimated contribution to 2020 target of 50% or 240,000 tonne reduction in disposal		
	Original (2011) planned		Current (2016) actual
	Target %	Tonnes targeted	Tonnes achieved
City of Vancouver food scraps collection services	5%	24,000	27,400
Private sector food scraps programs	16%	76,800	Reliable data not available
EPR for PPP and e-waste	14%	67,200	
EPR and private sector programs for diverting C&D materials	11%	52,800	
Reuse and niche energy recovery initiatives	4%	19,200	
Uncategorized	-	-	81,600
Total	50%	240,000	109,000 (23%)

Challenges to Come

In order to describe the level of future challenges in dealing with solid waste originating from Vancouver, Figure 2 shows the potential range of additional waste tonnes from all sectors with population and economic growth projected out to 2040, if current waste diversion efforts maintain status quo. This illustrates that total solid waste that may require disposal could grow

by more than 77% from 2016 to 2040 if significant efforts are not made to reduce and avoid the amount of waste generated within Vancouver.

Figure 2

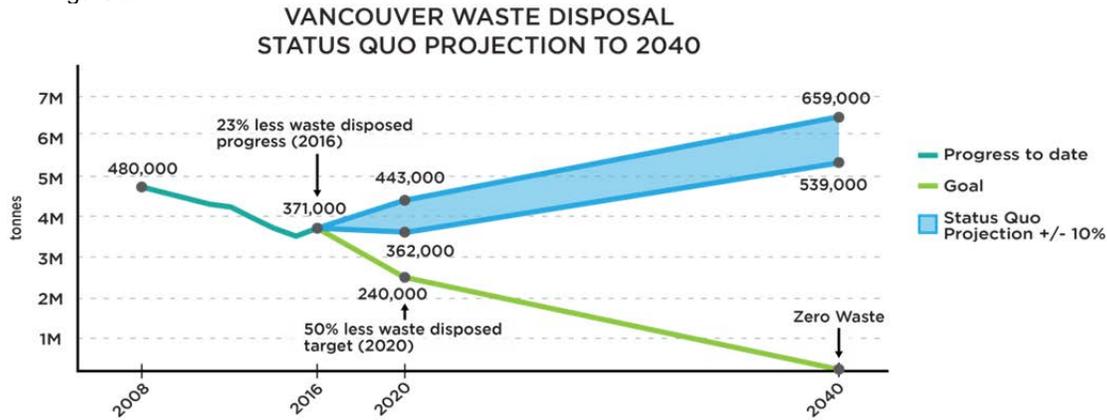


Figure 2 Notes:

1. This estimate serves only as a guide since future quantities of waste materials will be highly variable and influenced by factors beyond the City’s direct control, such as population changes, economic activity, and natural and other unplanned events.
2. Solid waste data is compiled first at the regional level and then at the city level. As a result, Vancouver’s data is always about one year behind the reporting period.
3. The slight increase in waste disposed in 2016 compared to 2015 is consistent with what was experienced across the Metro region and is attributed to economic growth.

In addition to population and economic growth as factors which impact waste generation, societal norms and consumer and business behaviours also create uncertainty and challenges to reaching zero waste. In summary, factors influencing waste generation (which are particularly challenging for local governments to overcome) include:

Factor	Driver
Individual ownership	Convenience and status
Low priced, readily available goods; bulk quantities	Replace instead of repair; increased consumption
Rapid technology changes; popular fashion	Replace early and often
Recycling challenges	Changes in materials; increased use of multi-materials/composites
Single-use disposable	Quick, clean, safe, convenient

The potential volumes of waste that may need to be managed in the future underscore the need for Vancouver to expand focus upstream, with priority given to minimizing the creation of waste and ensuring that remaining materials are fully utilized as resources and in a manner that complements existing waste diversion programs.

Unrealized and Wide-ranging Benefits of Pursuing Zero Waste

The benefits of pursuing zero waste go beyond reducing pressure on recycling, composting, and disposal facilities, and extend beyond Vancouver. They can be characterized as follows:

Environmental Benefits
<ul style="list-style-type: none"> • By reducing the amount of materials created and disposed, associated greenhouse gas (GHG) emissions and other pollutants are reduced. • Using fewer materials (some of which may be toxic), reduces Vancouver’s ecological footprint.

Economic Benefits
<ul style="list-style-type: none"> • Fewer materials to manage as waste results in cost savings to the City, residents, and businesses by avoiding the cost of developing and managing new waste disposal facilities and services. • Sharing and reuse can avoid the cost of buying and replacing short-lived consumer goods, thereby reducing household costs. • Materials disposed include recoverable, reusable, shareable and recyclable resources that can support new business opportunities and reduce the risk of relying on increasingly scarce virgin materials. • Moving away from waste disposal creates opportunity for innovation and a shift away from a linear economy towards one which is circular. • An economy in which materials remain in circulation has the potential to grow and attract new businesses creating more 'green' and inclusive jobs.
Social Benefits
<ul style="list-style-type: none"> • A zero waste community provides opportunity for all residents of Vancouver to be more connected through programs involving repair, sharing, and reuse. • Recovering materials that are re-useable and rescuing food that is edible can provide employment across the livelihoods continuum, meeting people where they are at on the employment spectrum.

A Vision of Vancouver as a Zero Waste Community by 2040

A zero waste community is a community which supports sustainable resource use, a healthy economy, affordability, vibrant and inclusive neighbourhoods, and equal opportunity through the elimination of solid waste.

The primary objective of the Plan is to eliminate the disposal of solid waste to landfill and incinerator by 2040, through alignment with an approach which includes, in order of priority:

1. Avoid & Reduce
Avoid the generation of waste and reduce the amount of waste that can't be avoided.
2. Reuse
Prioritize material reuse such as sharing, repurposing, repairing and refurbishing over recycling and disposal.
3. Recycle & Energy Recovery
Increase the total amount of material recycled, reduce carbon emissions by maximizing the recovery of inedible food and green waste for composting and renewable energy recovery.

Feedback received from consultation and supported by staff research identified three key areas of focus:

1. **Support system-wide change** - with new collaborations across broad sectors of society and industry, at a national and global scale to influence behaviours and decisions not necessarily confined to the jurisdictional boundaries of Vancouver.
2. **Prioritize actions by focus areas** - based on materials disposed and the sectors in which these materials originate:
 - *Built Environment* - What is designed, built, maintained and demolished, and how these materials are managed.
 - *Food & Packaging* - What is grown, packaged and purchased, what is not consumed/what remains and how we manage these items.
 - *Products & Packaging* - What is designed, manufactured, packaged and purchased, and how we manage these items.

- *Residuals* - What remains after waste is avoided, reduced and reused. This is the sum total disposed from each of the other focus areas.
3. **Lead by Example** - involving direct action by the City to reduce waste and efficiently manage materials within its own facilities and operations to achieve zero waste.

Directions for Vancouver

Achieving an ambitious goal like zero waste when the City has limited jurisdiction will be a complex task. Success is dependent on the actions collectively taken by the City and those who live in, work in, and visit Vancouver.

Community directions identified where the City has a strong supportive role to play include:

- Support priority actions beyond recycling
- Take a collaborative systems-wide approach
- Foster a zero waste culture
- Transition to a strong circular economy
- Foster zero waste innovation
- Support zero waste infrastructure and technology
- Develop socially and operationally supportive and enabling zero waste policy and regulation
- Improve data collection, research, and accessibility
- Support the expansion of Provincial EPR programs.

City Actions

In developing the plan we have focused on:

1. **Priority Actions** - considered the highest level current priorities necessary to address the most significant waste flows being disposed and to leverage existing opportunities including those in support of the 2020 target.
2. **Transformative Actions** - considered 'iconic' initiatives designed to stimulate and sustain significant momentum towards zero waste.
3. **Enhanced & Expanded City Roles** - comprised of a variety of strategic interventions which were identified as opportunities for detailed consideration and planning.

Priority Actions

Priority actions, outlined below, focus on the diversion of construction and demolition (C&D) materials, food scraps, and other compostable organics to address immediate waste diversion system challenges and opportunities, support further movement towards the 2020 target, and help lay the necessary ground work for further progress over time.

Focus Area	Built Environment & Residuals
Action	<ul style="list-style-type: none"> • Recover wood and produce biofuel from demolition materials at the Vancouver Landfill • Expand Green Demolition By-Law • Identify and pursue options to support and grow markets for salvaged deconstruction materials
Rationale	While significant progress has been made in the diversion and recovery of materials from the built environment, this area continues to be the greatest contributor of total waste disposed from Vancouver at about 158,000 tonnes per year. By pursuing these Priority Actions, it is estimated that upwards of 40,000 tonnes of C&D materials could be diverted annually.

Focus Area	Food & Residuals
Action	<ul style="list-style-type: none"> Identify and plan organics processing opportunities Become a national Love Food Hate Waste campaign partner Identify and pursue options to improve food rescue and redistribution systems
Rationale	<p>When C&D waste tonnes are excluded from the total tonnes of materials disposed from Vancouver, the largest single component of residential, business and institutional sector garbage is compostable food and food soiled paper, at 29 per cent or about 81,000 tonnes annually.</p> <p>The City has been invited to participate as a partner in the Love Food Hate Waste (LFHW) Canada campaign, a significant collaboration opportunity to demonstrate municipal leadership in the global fight against food waste. It has been reported that one third of food produced globally is wasted and 47% of food waste in Canada can be attributed to households. First developed by the Waste and Resources Action Programme (WRAP) out of the United Kingdom, LFHW is now a globally recognized campaign active around the world, with proven results. LFHW Canada, overseen by Metro Vancouver on behalf of the National Zero Waste Council, will bring together retailers, governments and consumers to rethink their relationship with food. The campaign is planned for launch in May/June 2018 and the estimated cost as a campaign partner is not expected to exceed \$50,000 per year, with funding from Engineering's annual solid waste operating budget, beginning in 2018. Campaign partners receive various benefits produced, managed and executed by Metro Vancouver on behalf of the National Zero Waste Council including marketing and media plans, communications art work, collaboration with other world leading municipal partners, consistency in messaging, website and social media channels, and access to LFHW data and resources to develop world class programs specific to the needs of Vancouver.</p>

Focus Area	Products
Action	<ul style="list-style-type: none"> Implement a Single-Use Item Reduction Strategy Expand community Zero Waste Drop-Off Events Develop new reduction and diversion strategies targeting paper and plastic Identify and pursue options to support and grow product reuse and sharing Develop an Apparel Waste Reduction Strategy
Rationale	<p>Products of all types currently make up about 27 per cent of waste disposed. This category of waste is comprised of various material types; however paper and mixed plastic make up approximately 20% and 23% of the products and packaging focus area, respectively. The remaining materials include things such as textiles, household hygiene products, non-compostable organics, and various laminates and mixed materials including single-use items.</p>

Focus Area	City to Lead by Example (Cross-cutting)
Action	<ul style="list-style-type: none"> Develop a Green Operations Zero Waste Plan
Rationale	<p>While Vancouver pursues the goal of zero waste, it is crucial that the City 'walk the talk' within its own operations, creating a model for others outside the organization to replicate.</p>

Transformative Actions

Deep-rooted zero waste challenges faced by all sectors in Vancouver need ambitious and bold action. The following proposed Transformative Actions are based on stakeholder discussions, Advisory Panel input and staff research. These will be assessed and developed in more detail as part of the Plan's implementation and brought to Council for approval as required.

Focus Area	Action	Rationale
Residuals	Refocus Vancouver Landfill operations to recovery and diversion over disposal	<ul style="list-style-type: none"> Reduce pressure on diminishing disposal capacity Address diversion infrastructure capacity gaps
Food	Become a Leading City in Food Waste Prevention	<ul style="list-style-type: none"> 50% of food disposed is avoidable Key opportunity to integrate with launch of Canadian Love Food Hate Waste campaign
Products	Implement a Single-Use Item Reduction Strategy	<ul style="list-style-type: none"> Target highly visible, commonly disposed materials Costly items for City to manage
Built Environment	Develop a Zero Waste Building Program	<ul style="list-style-type: none"> Influence the total life-cycle of built assets beyond recycling programs and towards a more circular economy
All	Develop a Template Zero Waste Procurement Standard	<ul style="list-style-type: none"> Influence retailer, supplier, and producer behaviours within and outside Vancouver Stimulate circular economic activity related to reuse, repair, shared and recycled content
All	Form a Zero Waste Innovation Fund with Like-minded Partners	<ul style="list-style-type: none"> Incubate innovative technologies, processes and business concepts to support zero waste and circular economy

Enhanced & Expanded City Roles

Transformative moves alone will not enable Vancouver to reach zero waste; strategic intervention by the City is essential across a number of fronts. These interventions or actions require the City to enhance its existing roles and pursue new ones.

Influence	By utilizing the authority set out by the Vancouver Charter, regulation, fiscal measures, and other policy tools can be utilized to set minimum requirements for zero waste practices.
Support	In a supportive role, the City can provide, enable and grow systems, capacity, innovation and incentives necessary to support residents, businesses and community organizations in Vancouver to achieve zero waste through communications and engagement, research, planning, data collection, infrastructure, programs and services.
Lead by Example	By leveraging the City's purchasing power, enhancing its operating policies and procedures, utilizing its portfolio of properties and assets and leading by example through its labour force, the City can reduce its contribution to the overall amount of waste generated in Vancouver, produce transferable knowledge and create opportunities for the public, social enterprise organizations, the business community, and other municipalities and levels of government.

The Plan lists various proposed enhanced and expanded City roles based on stakeholder input and staff research, and will be evaluated and planned in greater detail as part of Zero Waste 2040 implementation planning.

Implementation Planning

Some of the actions outlined in the Plan are relatively straightforward to implement, while others are more complex and rely on partnerships or external funding. Others represent fundamental changes to the way the City does business.

For those that are more complex, further technical and business case analysis will be undertaken, and in some cases, additional consultation may be needed around implementation. Once complete, resulting programs, projects and policy changes, and associated recommendations on business model, partnerships and financial strategy will be brought

forward to Council for consideration as part of the annual budget process, the capital planning process and/or special approvals, as required.

The implementation approach is broadly organized into the three groups of actions, as follows:

1. **Priority Actions** – Some of these actions have already been initiated, whereas others will start with Council’s approval of the Plan. Approval and timing of actions requiring funding not accommodated within existing budgets will be brought forward as part of the budget process.
2. **Transformative Actions** – Transformative actions may unfold over several years, requiring further study, public and stakeholder consultation, and future decisions by Council. A detailed implementation plan, supported by sound business case analysis as well as partnership and financial strategy, will be prepared for each Transformative Action and presented to Council for approval before implementing. The following Transformative Actions will be prioritized for detailed planning following Council’s approval of the Plan, with the remaining to be planned over the long term:
 - a. Refocus Vancouver Landfill operations to recovery and diversion over disposal
 - b. Become a Leading City in Food Waste Prevention
 - c. Implement a Single-Use Item Reduction Strategy
3. **Enhanced & Expanded City Roles** – Given the large number of actions in this group, a phased approach will be followed whereby sets of actions will be planned and implemented in coordination with the long-term financial and capital planning budget processes.

For all major capital investment decisions in 1-3 above, the business case used to support future recommendations for funding will be comprehensive and include:

Aspect of Evaluation	Analysis Required
1. Market Analysis	Evaluate suppliers, customers and competitors specific to a material/service to better understand the opportunity’s viability and relative market size
2. Operational Analysis	Evaluate operational options to achieve desired Zero Waste 2040 objectives
3. Technical Analysis	Evaluate engineering technologies to inform infrastructure options
4. Business Model Analysis	Evaluate City role with respect to ownership and operations of all or a portion of any infrastructure
5. Financial Analysis	Evaluate financial implications of operational, ownership and technical options
6. Risk Assessment	Evaluate risks using the City’s standard risk assessment framework

Monitoring and Reporting

The Plan will be reviewed every five years to measure and report progress towards the objectives of the Plan. Directions and planned City Actions will be re-evaluated to take into account changes in the system such as a growing population, employment, economic activities, policy changes, and regional and provincial government and private sector waste management system changes.

Success towards the primary objective will be measured by the annual reduction in tonnes of solid waste from Vancouver disposed to landfill and incinerator, with a 2040 aspirational target of zero tonnes disposed. Over the term of Zero Waste 2040, trends in various other metrics will be monitored as indicators of performance for the Plan’s supporting and complimentary objectives. Metrics will be selected during the development of implementation plans for each of

the actions identified, and will be based on best available quantitative and qualitative information for Vancouver.

Implications/Related Issues/Risk (if applicable)

Financial

While some City Actions can be accommodated within existing budget, others that require additional funding will be reported back to Council for consideration as part of the long-term financial and capital planning and budget processes. Further, those actions will be supported by an implementation plan including sound business case analysis as well as viable partnership and financial strategies.

The annual cost of the three-year Love Food Hate Waste Canada campaign partnership referred to in Recommendation C is not expected to exceed \$50,000 plus applicable taxes, with funding from Engineering's annual solid waste operating budget, beginning in 2018.

Environmental

Without focussing efforts upstream at the sources of waste, there will continue to be increasing strains on an already overburdened waste system, including the Vancouver Landfill which has about 20 years of remaining capacity based on current operating agreements. Recycling and composting also focuses on what's left '*at the end of the pipe*' where materials are the most challenging to deal with, have the greatest potential to impact the environment, and have lower inherent value.

Other

Zero Waste 2040 integrates with various other City strategic plans including: Renewable City Strategy, Healthy City Strategy, Food Strategy, Economic Development Strategy, Green Demolition Strategy and a number of the goal areas of the Greenest City Action Plan in addition to Zero Waste. Areas of alignment with other strategies include:

- **Greenest City Strategy, Renewable City Strategy** – increased recovery of inedible organic materials provides opportunity to generate renewable energy and reduce greenhouse gas emissions from reduced landfilled waste.
- **Food Strategy, Healthy City Strategy** – food rescue and redistribution systems and individuals in need can be supported by rescuing edible food away from disposal.
- **Economic Development Strategy** – local repair, sharing and reuse businesses are supported by redirecting reusable products and materials, which supports the local economy and reduces the need for new things.

CONCLUSION

Zero Waste 2040 is the culmination of extensive consultation and detailed solid waste management planning. Staff are seeking Council adoption of Zero Waste 2040 as a strategic policy framework to guide future decisions regarding the management of solid waste as resources in the years ahead. Staff will follow the anticipated implementation approach outlined above to further plan and implement the proposed City actions. Adoption and implementation of this Plan will help to achieve the City's long-term goals of supporting our economy, our people, and our environment.

As early actions towards implementation of the Plan, staff are seeking Council authorization to develop a Green Operations Zero Waste Plan for City operations and to enter into a partnership

agreement with the National Zero Waste Council for the Love Food Hate Waste (LFHW) Canada Campaign. Staff will seek Council approval of all other programs and projects that require policy change or financial investments that cannot be accommodated in current approved operating and capital budgets.

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CITY OF VANCOUVER

Zero Waste 2040

The City of Vancouver's Zero Waste Strategic Plan



May 2018



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SETTING THE STAGE

Planning Context – a Strong, Integrated Policy Foundation

The City's mission statement is to “*Create a great city of communities that cares about our people, our environment, and our opportunities to live, work, and prosper.*” To achieve this mission, the City has created three core City-wide strategies that work together to support people, the environment, and the economy: the Healthy City Strategy, the Greenest City Action Plan (GCAP), and the Economic Development Strategy.

The Greenest City 2020 Action Plan was approved by Council in 2011, and established:

- a goal to create zero waste, and
- a 2020 target to reduce solid waste from all sources disposed to landfill and incinerator by 50% from 2008 levels.

Considerable progress has been made towards the 2020 target – 23% or 109,000 tonne reduction has been achieved as of 2016 – and work on priority actions identified in existing zero waste policy is continuing. For example, a major part of progress towards achieving the City's 2020 goal relied on initiatives of other levels of government to implement new Extended Producer Responsibility (EPR) programs that have not yet materialized and this will continue to be an area of focus under Zero Waste 2040.

Zero Waste 2040 is in response to Council adopting the following motion on May 31, 2016:

“THEREFORE BE IT RESOLVED THAT staff be directed to undertake a Zero Waste Strategy that creates a framework to achieve the Greenest City long term goal of zero waste.”

Zero Waste 2040 is a long term strategic vision for Vancouver as a community to achieve the goal of zero waste by 2040. It will help guide future decisions and investments relating to solid waste, and identifies areas where the City can play a role in stimulating community, economic and societal changes needed to achieve the goal of zero waste. It is an evolution of the work and success of current zero waste policies and programs.

In addition to establishing direction for achieving the City's zero waste goal, Zero Waste 2040 can also contribute to progress being made under other GCAP Goal Areas and City strategies. Areas of alignment with other strategies include:

- **Greenest City Strategy, Renewable City Strategy** – increased recovery of inedible organic materials provides opportunity to generate renewable energy and reduce greenhouse gas emissions from reduced landfilled waste.
- **Food Strategy, Healthy City Strategy** – food rescue and redistribution systems and individuals in need can be supported by rescuing edible food away from disposal.
- **Economic Development Strategy** - local repair, sharing and reuse businesses are supported by redirecting reusable products and materials, which supports the local economy and reduces the need for new things.



City's Jurisdiction and Current Role

The City's primary waste management responsibility has traditionally been service delivery including:

- Compostable organics (green bin) and garbage collection service, primarily to single family and duplex properties
- Residential recycling collection, which is now the responsibility of product producers through Recycle BC
- Collection of litter from parks, streets and sidewalks
- Public drop-off depots for recycling
- Communication and education to support diversion programs and litter reduction
- Waste transfer and disposal services
- Programs and by-laws for regulating waste collection and disposal.

The City owns and operates the Vancouver South Transfer Station, the Zero Waste Centre, and the Vancouver Landfill and Recycling Depot which is located in the City of Delta and receives waste materials from across the Metro Vancouver region.

Statutory authority for these City services and programs is provided under the Vancouver Charter.

In British Columbia, cities, regional governments and the Province are involved in the management and regulation of municipal solid waste. Vancouver is part of a regional waste system managed by the Metro Vancouver Regional District, under Provincial regulation and oversight. Metro Vancouver is responsible for the long term planning and disposal of solid waste generated in the region through plans, policies, bylaws and strategies, and many of Vancouver's solid waste management activities are shaped by what is implemented at the regional level. Vancouver works closely with Metro Vancouver on the planning, implementation and operations of various regional solid waste policies and programs, and with the City of Delta on the Vancouver Landfill's operations and environmental protection systems.

The BC Ministry of Environment & Climate Change Strategy has regulatory authority over extended producer responsibility programs throughout the province and regulates the operations of the Vancouver Landfill through a Ministry issued Operational Certificate. Vancouver liaises with the Ministry of the Environment & Climate Change Strategy on provincial solid waste policy and regulation.

There are also numerous private and not-for-profit organizations involved in all stages of material supply chains. Designers, manufacturers, growers, packagers, distributors, marketers, transporters, brokers, retailers, and buyers all play a role in supplying and sourcing products and materials which eventually become solid waste. Private sector waste management and hauling companies, downstream materials processing and marketing companies, and various non-profit and social enterprise groups play important roles in the collection, transfer and processing of garbage, green bin, recycling and other

Extended Producer Responsibility

In British Columbia, Extended Producer Responsibility (EPR) (formerly referred to as Industry Product Stewardship) is a regulatory approach whereby producers (manufacturers, sellers, brand-owners and first importers) are responsible for managing their products and packaging across the full life-cycle, from selection of materials and design, to funding and managing recycling programs at the end of the product's life.

solid waste materials. These multi-faceted materials management systems provide complexity as well as opportunity as we look forward with a focus on transitioning Vancouver to become a zero waste community.

Vancouver South Transfer Station & Zero Waste Centre in Vancouver	Vancouver Landfill in Delta
<p>Built in 1989, the Vancouver South Transfer Station provides a convenient drop-off location for local residents and commercial customers and serves to reduce traffic along the roadways in Delta leading to the Vancouver Landfill. The Zero Waste Centre provides residents and small commercial haulers the opportunity for reuse and recycling of various materials. On average about 550 vehicles are served each day at these facilities.</p>	<p>In operation since 1966, the Landfill serves almost 70% of the Metro Vancouver region and is authorized by the Ministry of Environment & Climate Change Strategy and regional solid waste management plan. The current operating agreements with Metro Vancouver and the City of Delta expire in 2037. The annual disposal limit of the Vancouver Landfill is 750,000 tonnes.</p>

Scope: Defining Zero Waste

Waste is a broad term that can include many things and zero waste can mean different things to different people. “Waste” within the context of Zero Waste 2040, refers specifically to *municipal solid waste* as defined by the British Columbia Environmental Management Act and generated within the municipal borders of the City of Vancouver. Municipal solid waste includes *refuse that originates from residential, commercial, institutional, demolition, land clearing and construction sources*.

PLAN DEVELOPMENT AND CONSULTATION

The Zero Waste 2040 plan outlined in this document considered best practices from around the world as well as local expertise and public input. Through a Council motion, staff were directed to develop a long term plan, which can be summarized into three key steps:

1. **2016** – Strategy framework - Drafting the vision, defining the strategic approach, and setting objectives
2. **2017** – Opportunity identification and evaluation - Identifying opportunities, and evaluating community directions and City roles to action
3. **2018** – Plan development and report to City Council - Refining community directions and City actions, and preparing a plan

The plan was developed based on:

- research, staff focus groups, stakeholder workshops and input provided by subject matter experts;
- consideration of barriers, unintended consequences, risks, leverageable assets, inter-dependencies and synergies with respect to achieving zero waste;
- the expected impact a direction will have on reducing the overall generation of materials which become waste, reducing the amount of material requiring disposal to landfill or incinerator; and
- consideration of complementary social, environmental and economic benefits.

Directions vs City Actions

In the development of Zero Waste 2040 these terms have the following meaning:

Directions outline *WHAT* Vancouver as a community (City and others) must collectively move towards to shift to a zero waste future state.

City Actions outline *HOW* the City will help enable Vancouver as a community to reach zero waste through policies and actions.

Adapting to Change

While we can plan for the future, we can't know what advancements in technology and external change will happen in the years to come. As such, we have developed a plan intended to be flexible as new opportunities and challenges arise. Additionally, with limited jurisdiction to solve such a complex problem, the City must find ways to enable all partners and stakeholders with whom we work so that we can achieve the goal together.

As such, the plan is designed to be adjusted and updated as experience and knowledge is gained through continuous learning, as technology advances and markets change, as ideas and behaviours evolve, and as new policies, plans and regulations are introduced by senior levels of government.

Consultations

Local expertise and public input was sought from stakeholders at each step of the planning process and, alongside technical research, informed the development of the Zero Waste 2040 plan. Consultations generally took three forms:

1. **Zero Waste 2040 workshops** - Participation of residents, businesses, non-profit organizations and other orders of government engaged in the topic of zero waste. The purpose of the workshops was to develop a shared understanding, create a high level vision for zero waste, and identify challenges, priorities and possible directions for the community.



Input received was summarized in a Zero Waste 2040 Workshop Consultation Summary, included in this Plan as Appendix 6.

2. **Zero Waste Advisory Panel meetings** – Regular meetings comprised of representatives from the business community, academia, non-profit organizations, and local, regional and provincial government with the purpose of providing subject matter expertise in zero waste throughout the planning process.
3. **Surveys and Pop-up City Hall events** – Numerous Pop-up City Hall events, surveys and social media platforms to gather input from a large and diverse set of residents, organizations and visitors.

Since 2016, consultation efforts with individuals and organizations reached over 7,000 touchpoints through in person channels and 25,000 touchpoints online.

RISING TO THE CHALLENGE

Vancouver aspires to be a zero waste community by 2040, through eliminating the need for solid waste to be disposed in landfills and incinerators. In the future, residents, businesses and visitors will think differently about everything currently disposed. Zero waste will be achieved through avoiding and reducing waste, keeping materials in circulation as long as possible, and then recycling, composting and producing renewable energy from materials that remain.¹

Overview

Becoming a zero waste community by 2040 is an ambitious goal. In recent years, many communities have adopted the goal of zero waste. Typically those goals focus on *diverting* a certain percentage of total waste from disposal by a specific date by increasing recycling rates, rather than reducing the overall amount of materials sent for disposal to landfill and incinerator.

The concept of actually becoming a zero waste community, which no longer relies on landfill or incineration for disposal, will be much more challenging to achieve. Achieving this goal will require alignment across all sectors of society. It will require changes in attitudes and commitments from individuals and businesses to alter their behaviour and challenge current societal norms. What will it take then to realize this vision of zero waste?

This document outlines a path towards Vancouver realizing a vision of zero waste by 2040. It builds from the successes of current City policies and programs, and focusses on the changes needed in the future. It is designed to inform decisions and areas of focus relating to managing and ultimately eliminating the need for large scale disposal systems to serve Vancouver in the future.

What is a Zero Waste Community?

A Zero Waste Community is a community which supports sustainable resource use, a healthy economy, affordability, vibrant and inclusive neighbourhoods, and equal opportunity through the elimination of solid waste.

¹Developed in collaboration with the Zero Waste Advisory Panel

Why Zero Waste for Vancouver?

The proper management of solid waste — garbage, compostable organic materials, recycling, and debris from construction and demolition — is one of the most important core services municipalities provide. Collecting, diverting, disposing and regulating solid waste is crucial for maintaining a clean, healthy and vibrant city. Public expectation for the quality of these services remains high.

Over the last decade local governments, including Vancouver, have focussed efforts on increasing recycling and composting options. The increase has been in response to increasing demands on limited available waste disposal facilities and in an effort to manage wasted materials more sustainably.

This effort has resulted in significant *diversion* of materials to beneficial use, and a *reduction in waste disposed* to landfill and incineration, two important, but different measures of progress.

Recycling is Only Part of the Solution

In 2016, about 605,000 tonnes of materials from Vancouver were diverted from disposal through recycling and composting² resulting in a diversion rate of 62%, one of the highest in North America. However, assessing progress based on diversion alone does not paint a complete picture. From one year to the next, diversion from recycling and composting can increase at the same time as more waste is disposed to landfill or incinerator, thus the need to also measure total solid waste disposed.

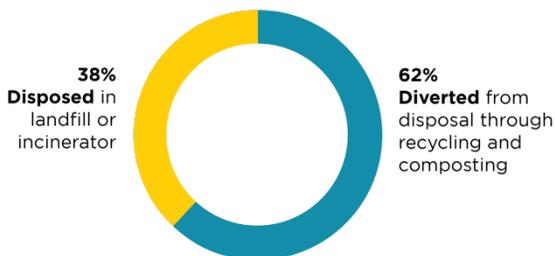
The success of the City's programs and the hard work of residents, businesses and the waste management private sector have led to a significant reduction in solid waste disposed over the past 10 years. In 2008, 480,000 tonnes of solid waste from all Vancouver sources went to disposal. By 2016 this total decreased by 109,000 tonnes to 371,000 tonnes disposed — a reduction of about 23% (Figure 1).

Relying on recycling and composting as the primary strategies for managing solid waste does not adequately address environmental impacts from increasing consumption and a growing population.

Diversion = the percentage of total solid waste that is recycled and composted

Reduction in Waste Disposed = the reduction in the amount of material disposed to landfill and incinerator

Disposal and Diversion Rates for Solid Waste in Vancouver



Diversion of material to recycling and composting will continue to remain an integral component of the City's waste policies and programs, however, there are many materials in the waste stream which are not currently recyclable or compostable, and reducing waste at source has superior benefits over recycling. As a result, these initiatives alone will not achieve zero waste. Recycling and

² Calculated based on applying the regional recovery rate for Vancouver. Data source: Metro Vancouver – Integrated Solid Waste and Resource Management Plan Biennial/5 Year Progress Report (November 2017)

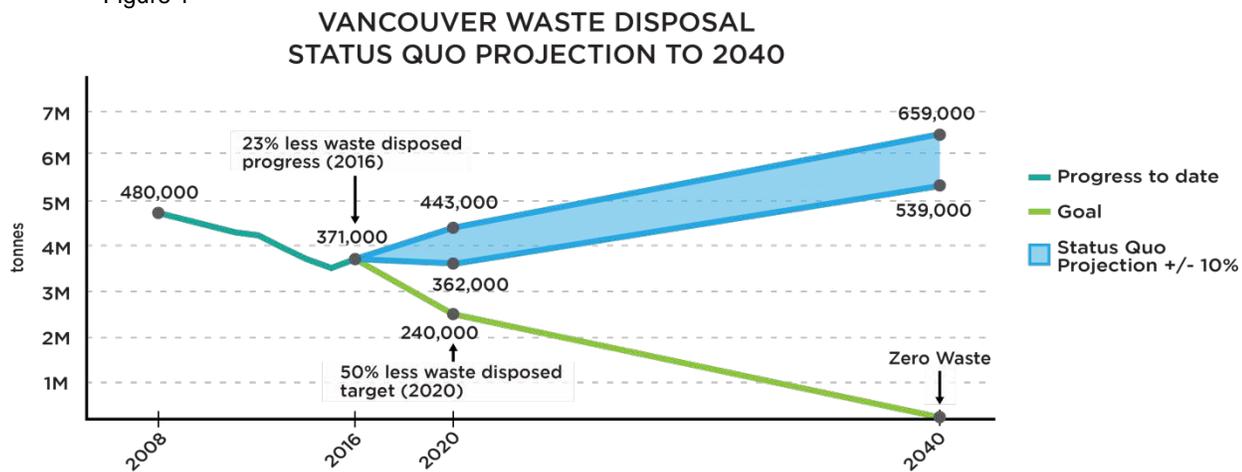
composting also focus on what's left 'at the end of the pipe' where materials are the most challenging to deal with, and have lower inherent value.

Planning for Growth

In addition, any long term strategy must anticipate the impacts from factors such as economic growth, increasing consumption and a growing population. Without additional zero waste programs and a community-wide shift towards zero waste, Vancouver's total solid waste disposed to landfill and incinerator is expected to increase each year due to these factors.

Figure 1 illustrates how the total amount of solid waste disposed would increase from 2016 to 2040 if current waste reduction and diversion efforts maintain status quo. Based on population and economic growth, the amount of solid waste disposed could grow by more than 77% from 2016 to 2040 if significant efforts are not made to reduce and avoid the amount of waste Vancouver generates.³

Figure 1



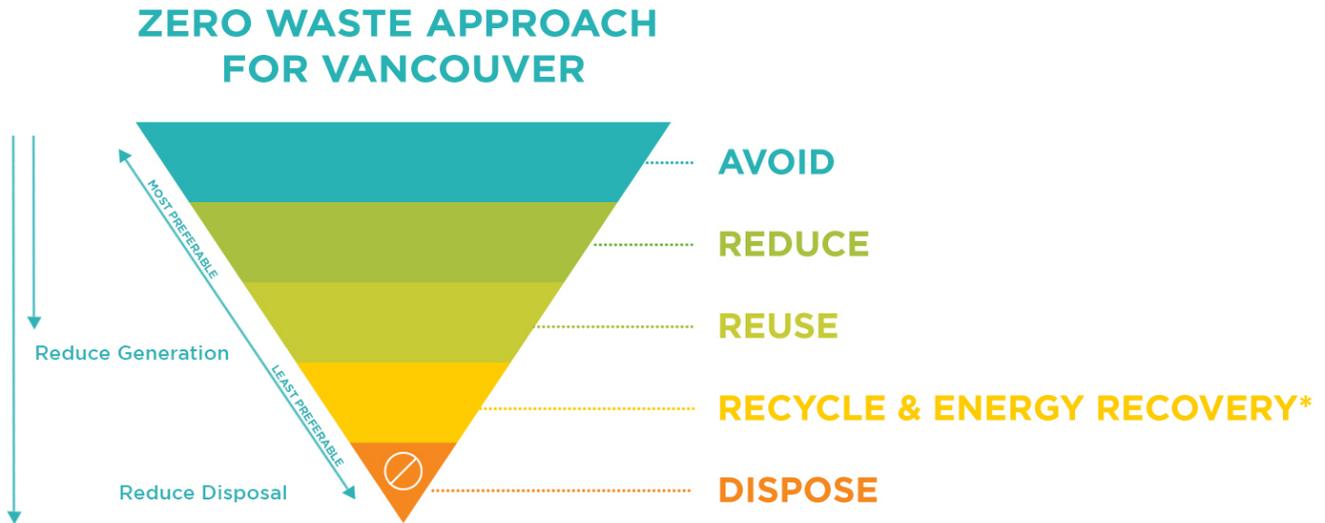
The Current Waste Management System is Reaching its Limits

Without also focusing efforts upstream at the sources of waste, there will continue to be increasing strains on an already overburdened waste system. Vancouver's waste is managed within a regional system. Waste from Vancouver is disposed and processed at sites throughout the region, and the Vancouver Landfill receives waste from other municipalities besides Vancouver. At the current fill rate, without additional regional efforts around maximizing diversion, the Vancouver Landfill may well reach capacity as early as 2028.

These factors may be considered risks to the solid waste system and Vancouver's ability as a community to make significant new progress in reducing the amount of waste disposed. However, future risks and current system challenges underscore the need to expand our focus upstream where we can place priority on minimizing the creation of waste and ensure that remaining materials are fully utilized as resources in a way that complements the City's existing waste diversion programs.

³ The status quo projection is intended as an illustrative example only since the future amount of solid waste disposed is influenced by a wide range of influencing factors beyond the City's direct control. The projection assumes no change to the diversion rate, a 30% increase in the amount of waste generated per person to account for economic growth and 25% population growth between 2016 and 2040. A range of plus/minus 10% reflects the uncertainty in projecting amounts of solid waste. Growth rates for solid waste generation per capita are taken from a model developed by Metro Vancouver that uses published actual and projected GDP growth rates to estimate how economic activity will impact solid waste generation 2011 to 2030. The annual growth rate in 2030 is held constant 2030 to 2040. The Vancouver population forecast was prepared by Metro Vancouver Planning, Policy and Environmental Department/Regional Planning staff May 9, 2017.

We must create strategies for moving up the pipe to the point of waste generation by focusing higher up on the Zero Waste Approach for Vancouver.



**Recovering energy from organic materials such as food and, in the case of single-use items, compostable packaging*

Unrealized and Wide-Ranging Benefits

The benefits of pursuing zero waste extend beyond simply reducing pressure on recycling, composting, and disposal facilities. These complementary benefits are wide-ranging and extend beyond Vancouver:

Protecting the Environment

- *Addressing climate change & other environmental impacts:* Extracting resources, producing, transporting and storing food, products and other materials, and then managing these items once they are considered waste creates greenhouse gas (GHG) emissions and other pollutants. GHG reductions could come from local reductions in fossil fuel burning, less GHGs from decomposing waste and fewer GHGs from extraction and production of materials in other parts of the world. Reducing the amount of materials we need to manage and ultimately dispose of, can result in reductions in GHG emissions and other pollutants associated with the production of those materials both locally and globally.
- *Reducing Vancouver's ecological footprint:* Vancouver residents have an ecological footprint two times larger than the Earth can sustain⁴. In a future in which we achieve zero waste, we will use fewer materials and reduce demand for new materials, which in some cases may be manufactured using toxic materials or be toxic themselves. The ecological footprint is a measure of global impacts, and a reduced ecological footprint provides global benefits and supports a long term goal of one planet living.

⁴ City of Vancouver Greenest City 2020 Action Plan

Contributing to Economic Well-being

- *Solid waste as a resource*: Despite the significant success of current waste diversion programs, materials disposed include recoverable, reusable, repairable, shareable and recyclable materials and resources that can support new business opportunities, reducing the need for increasingly scarce virgin materials and inputs.
- *New business models & technology*: The transition to zero waste provides an opportunity for innovation and a shift away from a linear economy towards one which is circular.
- *New jobs*: A circular economy has the potential to grow and attract new businesses creating more 'green' and inclusive jobs.
- *Reduced waste disposal costs*: A zero waste future offers cost savings to the City, residents, and businesses by avoiding the cost of developing and managing new waste disposal facilities.
- *Reduced household costs*: Shifting to sharing and reuse can avoid the cost of buying and replacing short-lived consumer goods.

The Future is Circular

A circular economy is an alternative to a traditional linear 'extract-produce-consume-dispose' economy. In a circular economy waste materials from all stages of the process are recovered and fed back into the system such that materials remain in use for as long as possible. Shifting to a circular economy supports a zero waste future and would also contribute to the City's social and economic goals.

Benefitting People

- *Strengthening community connections*: Vancouver is defined by its diversity of residents, businesses and visitors, their values and norms, and their ability to adapt and shape Vancouver as a community of communities. Becoming a zero waste community provides the opportunity for all Vancouver residents to be more connected through programs involving repair, sharing, and reuse.
- *Social justice*: Recovery of products that are re-useable and rescuing food that is edible can provide employment across the livelihoods continuum⁵, meeting people where they are at on the employment spectrum. These materials may also be a source of lower cost materials and food for those in need.

⁵ *Livelihood Continuum* - where community partners are able to find the appropriate opportunities for residents (low-barrier or medium-barrier employment and income generating opportunities, support for forms of low-income self-employment) and assist them to navigate pathways to other opportunities along that Continuum.

OBJECTIVES AND MEASURES OF SUCCESS

Zero Waste 2040 Objectives

Primary Objective

The primary objective of Zero Waste 2040 is to eliminate the disposal of solid waste to landfill and incinerator by 2040, an aspirational goal with an outcome dependent on the success of actions taken by the City and those who live, work and visit Vancouver.

Supporting Objectives

To avoid increasing the strain on an already overburdened waste system and focus efforts upstream at the source of waste, the plan's supporting objectives are aligned with the Zero Waste Approach for Vancouver and include:

- **Avoid/Reduce** - Avoid the generation of waste and reduce the amount of waste that can't be avoided
- **Reuse** - Prioritize material reuse such as sharing, repurposing, repairing and refurbishing over recycling and disposal
- **Recycle & Recover** - Increase the total amount of material recycled, reduce carbon emissions by maximizing recovery of inedible food and green waste for composting, and pursue opportunities to beneficially utilize organic material as a source of renewable energy.

Complementary Objectives

To enable system-wide change needed to reach zero waste beyond Vancouver and realize the complementary benefits associated with protecting the environment, contributing to economic well-being and benefitting people, Zero Waste 2040 will strive to (in no particular order):

- **Support community social goals** – Cultivating and sustaining vibrant, creative, safe and caring communities for the wide diversity of individuals and families who live in, work in and visit Vancouver.
- **Grow Vancouver's circular economy** – Decoupling economic activity from the consumption of finite resources, and designing waste out of the system; shifting away from a traditional 'extract-produce-consume-dispose' economy to one in which materials remain in circulation.
- **Develop a zero waste culture** – Changing people's lifestyles and business practices to emulate sustainable natural cycles, where all discarded materials are designed to become resources for others to use.
- **Reduce Vancouver's Green House Gas (GHG) emissions** – Reducing the emission of GHGs associated with the use and consumption of materials in Vancouver by helping people make better product and material choices and reducing their overall consumption.
- **Reduce Vancouver's ecological footprint** - Protecting and enhancing Vancouver's climate, ecology, natural resources and connections to the city's remarkable natural setting for future generations.

Measuring Success

Metrics

Success towards the primary objective will be measured by the annual reduction in tonnes of solid waste from Vancouver disposed to landfill and incinerator, with a 2040 target of zero tonnes disposed.

Over the term of Zero Waste 2040, trends in various other metrics will be monitored as indicators of performance for the plan's supporting and complementary objectives, which span across all levels of the Zero Waste Approach for Vancouver. Metrics will be selected during the development of implementation plans for each of the actions identified in the City Actions section of this plan, and will be based on best available quantitative and qualitative information for Vancouver. Examples of metrics that will be considered include:

- Growth in the number of share, repair and reuse assets
- Growth in 'green jobs' and 'green businesses' pertaining to zero waste/circular economy
- Total dollars of funding and investment available for zero waste and circular economy initiatives
- Total number of post-secondary courses teaching zero waste/circular economy concepts
- Tonnes of material collected for recycling
- Tonnes of compostable organics collected for composting
- Percentage of renewable energy derived from waste management operations
- Per capita disposal and diversion rates by sector
- Greenhouse gas emission reductions associated with solid waste and consumption

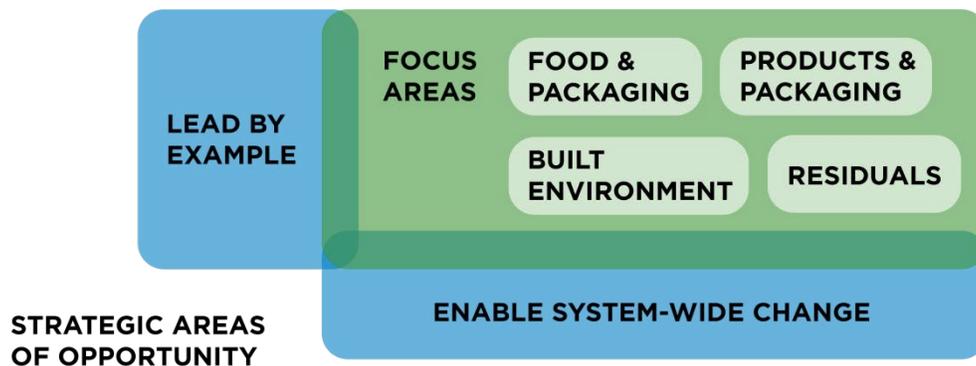
Selection of metrics will be informed in part by efforts to overcome data limitations:

- Vancouver's waste is managed as part of a regional system for collecting, disposing and recovering waste. Quantitative data about waste collected by private haulers and through EPR programs is often aggregated with regional totals and difficult to separate by municipality.
- Little quantitative data about reused materials is available and reuse has not historically been measured alongside disposal, recycling and composting activity.
- Materials are grouped into a limited set of categories in waste composition studies. Disposal trends can be difficult to identify, understand and monitor when materials-of-interest have not historically been categorized separately.
- Environmental footprint and GHG emissions can be more comprehensively measured by estimating a population's total use of materials, but consumption activity is difficult to track at the scale of an individual municipality. Waste is the best available proxy, but the environmental impact associated with materials still in use is not taken into account and decision-making must rely on an incomplete dataset.
- Data about zero waste activity and progress through initiatives administered by businesses, educational institutions and others in the community will require the development of new tracking tools and programs, and may only be available through voluntary reporting.

Reporting Progress

Zero Waste 2040 will be reviewed every five years to measure and report progress towards the objectives of the plan. Directions and roles will be re-evaluated to take into account changes in the system.

STRATEGIC AREAS OF OPPORTUNITY



Enable System-Wide Change

As it pertains to the management of resources and generation of waste, Vancouver is part of a much larger global system. Behaviours and decisions that result in the generation of waste are not always confined to the jurisdictional boundaries of Vancouver, yet Vancouver is the recipient of waste generated from those decisions, which makes change in the entire system critical to the success of the plan. Accordingly, Zero Waste 2040 proposes supporting existing and new collaborations across broad sectors of society and industry, and participating at a national and global scale to support behaviours and decisions not necessarily confined to Vancouver.

Focus Areas

Based on materials disposed and the source of those materials, four areas of strategic focus are defined for further action:



What is designed, built, maintained and demolished, and how these materials are managed.



What is grown, packaged and purchased, what is not consumed/what remains and how we manage these items.



What is designed, manufactured, packaged and purchased, and how we manage these items.



What remains to be managed after up front efforts to reduce, reuse and recycle have been exhausted.

Each area has relatively unique system characteristics associated with producing, distributing and consuming materials; ultimately resulting in the generation of significant amounts of waste. Below is a summary of the total annual tonnes of materials disposed, and originating from Vancouver, from each Focus Area.



Appendix 1, 2, 3 and 4 contain brief summaries of the characteristics associated with producing, distributing and consuming materials in each Focus Area, and how they are managed when they become waste; followed by a summary of the actions the City proposes to take within each Focus Area.

Lead by Example

In pursuing Zero Waste as a community it is important that the City ‘walk the talk’. Focusing on reducing and eliminating waste from City operations is the most effective way of showing the leadership needed to be successful. The City also has considerable purchasing power (negotiated and awarded \$151.4 million worth of contracts for goods and services in 2016), employs a large workforce (8,004 FTEs in 2017), and operates facilities located across Vancouver. Its sheer size and geographical presence makes the City a contributor to the amount of waste generated in Vancouver and an influencer in the community. Through developing appropriate policies, the City can influence others wishing to sell products or services. Therefore, direct action by the City to reduce waste, efficiently manage resources, and shift its own facilities and operations to achieve zero waste is a key area of opportunity.

COMMUNITY DIRECTIONS

Zero waste is not a goal the City can achieve alone: it requires the active participation of other organizations and governments, businesses, and the community as a whole, both locally and beyond Vancouver's municipal borders. Guiding directions for what Vancouver (both the City and the community at large) must do collectively to shift toward a zero waste future pertain to:

- supporting System-wide Change; and
- applying the Zero Waste Approach for Vancouver across all Focus Areas.

Supporting System-wide Change

Zero Waste 2040 proposes supporting existing work and leading new collaborations across broad sectors of society and industry, and at a local, national and global scale, to influence behaviours and decisions related to waste reduction. These directions amplify and accelerate the rate of change, and integrate across all four Focus Areas.

Challenges to Overcome

- Creating momentum to influence systems beyond Vancouver
- Sustaining momentum in a rapidly changing environment
- Differing and competing interests between stakeholders
- Culture of convenience
- The amount of effort required to move to zero waste and the relatively low cost of disposal.

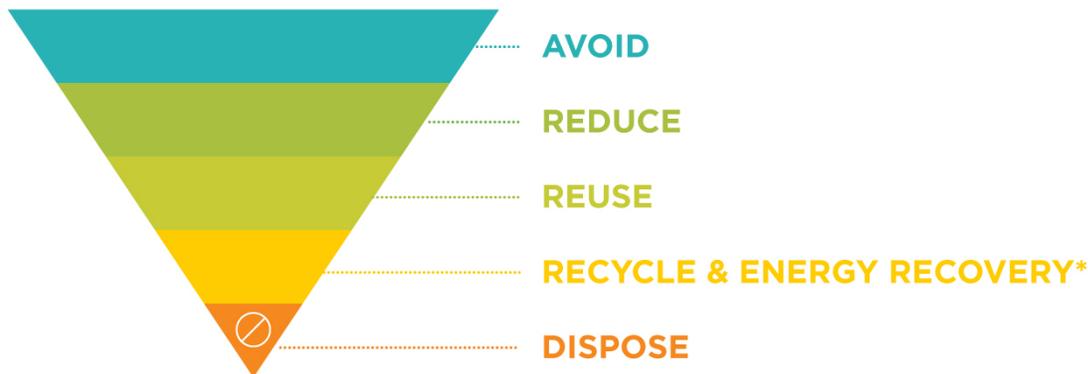
Directions for the Community

- ❑ **Initiate broad-based cultural and behavioural shifts towards zero waste:** By highlighting the opportunities and experiences consumers and businesses can create when they choose local resources to borrow, share, reuse and repair the things they need; as well as choosing to buy for value, durability and utility, whether it be a service or ownership could support thoughtful consumption in everyday choices and purchases that reflect our values and consider the upstream costs of goods and services.
- ❑ **Facilitate greater cross sector collaboration:** Appropriate forums for raising cross-sector, common issues and exploring opportunities is needed to facilitate participation that integrates industry, residents, academia, community organizations and all orders of government. In some cases achieving zero waste can be made possible by pursuing opportunities across Focus Areas rather than looking only within a single Focus Area. Similarly, approaches for tackling a challenge and realizing an opportunity in one sector can often be replicated in other sectors. Lastly, some sectors face the same challenge with no identifiable solution.
- ❑ **Foster an environment for innovation:** Zero waste cannot be achieved because of limitations in technology or process. New ideas can be incubated and demonstrate their impact to overcome the limitations faced by the current system (or redefine it entirely), then scaled up for wider adoption across sectors, stakeholders, and geographical boundaries. By challenging each other to re-think technologies and systems, create space for research and experimentation, demonstrate and recognize breakthroughs, and improve access to funding, we can foster an environment for innovation.

- ❑ **Set clear and thoughtful targets, metrics and direction:** Clear and thoughtful targets, metrics and direction established by industry and government can better align motivations and behaviours towards the goal of zero waste. Maturing measures of success beyond diversion rates to those which measure a reduction in total waste generated are needed, to shift community focus to reducing overall consumption of resources. Further, greater emphasis on reuse and resource circularity measures, targets and directions is needed, which prioritize the use of resources to their highest best use, instead of defaulting to recycling and energy production options.
- ❑ **Cultivate and support sustained leadership:** Getting to zero waste is not a sprint, it's a marathon. Continuous leadership is not only needed to initiate change, but also sustain it. A 'zero waste centre of excellence' or 'community of practice' is needed to develop, share and adopt leading practices and recognize zero waste achievements by businesses, residents and community organizations.
- ❑ **Pursue zero waste initiatives that support social justice:** Cost and benefits of initiatives are not always equally distributed across society. As we pursue zero waste, we can take care in ensuring that possible consequences of proposed actions are analysed from the perspective of service providers as well as from different resident groups, particularly those who are typically marginalized, for example, actions do not increase the financial and workload burdens of non-profit organizations, or ensuring that food rescue initiatives do not increase the provision of unhealthy, less appropriate food to residents.

Applying the Zero Waste Approach for Vancouver Across All Focus Areas

ZERO WASTE APPROACH FOR VANCOUVER



**Recovering energy from organic materials such as food and, in the case of single-use items, compostable packaging*

1. Avoid Generating Waste & Reduce What Remains

Avoiding and reducing resource use and the need to manage materials once they become waste can result in the greatest benefits to the environment and the greatest cost savings to businesses, residents and municipal government. Avoiding and reducing waste requires moving to circular practices, systems, behaviours and economies, and away from a 'take, make, purchase, dispose' linear paradigm. A future state that involves wide-spread waste avoidance and reduction is one in which we re-think, challenge, adapt, innovate and collaborate to create a zero waste culture and circular business models.

Challenges to Overcome

A key challenge involves shifting current behaviours that are influenced by ingrained values, beliefs and cultural norms that guide what and how much we purchase, and how we regard those things after they are no longer needed or valued. These factors have, over time, shaped how the performance of economies across the world are measured (e.g. Gross Domestic Product), contributed to the rapid pace that technologies and other products are developed and replaced, and have influenced policies and regulations, and planning, design and supply chain standards and practices, all of which impact the amount of waste generated.

Directions for the Community

- ❑ **Pursue higher level zero waste priorities:** product and building designers, manufacturers and builders adopt material avoidance and reduction practices, policies and guidelines, and prioritize reuse, repair, recyclability and recycled material content over planned obsolescence, in support of zero waste and circular economic principles.

- ❑ **Prioritize access over ownership:** residents, businesses and procurement professionals prioritize *access* to products, tools, equipment, etc. in place of *ownership*, opening the door for new businesses and services associated with renting, leasing, lending and repair.
- ❑ **Embrace a lifestyle involving reduced consumption and living with less ‘stuff’:** residents and businesses understand and embrace a lifestyle involving reduced consumption and living with less ‘stuff’, thereby saving money, gaining freedom and experiencing the joy of simplicity.
- ❑ **Understand the consequences:** businesses, residents and institutions understand the environmental, social and economic consequences (intended and unintended) of over consumption and wasting food and shift behaviours and practices to avoid waste.

2. Expand and Normalize Reuse

Reuse involves capturing potentially wasted value or capacity in products and materials that may otherwise sit idle unnecessarily and that can be shared, co-used, refurbished, repurposed, repaired, remarketed, and donated or sold. There are numerous advantages with reuse – it can be a catalyst for economic and social growth; reduce input costs for businesses; provide opportunity for new innovative business models and services; result in infrastructure investment so materials can be sorted, transported and connected with multiple users; and lead to the development of specialized skills and more green jobs.

Challenges to Overcome

- a deficit in skilled human resources to conduct repair, reuse and redistribution activity;
- limited scale which challenges the viability of reuse businesses and services without ongoing financial support;
- infrastructure to store and move materials and connect users;
- social stigma associated with second hand goods and rescued food;
- readily available low priced goods which motivate people to replace over repair;
- rapid changes in technology and fashion;
- individual ownership aligns with convenience and status;
- a lack of data on existing reuse activity.

Directions for the Community

- ❑ **Normalize reuse and repair:** popularizing reuse and sharing over discarding, replacing and individual ownership.
- ❑ **Grow market demand:** growing market demand for product sharing and materials repurposing.
- ❑ **Develop skills:** developing new skills, technologies and services, which can compete with product replacement options.
- ❑ **Educate on do-it-yourself:** having access to readily available information to facilitate do-it-yourself (DIY) repair and sharing transactions.
- ❑ **Build supportive infrastructure:** investing in reliable, convenient, and well run infrastructure and services, including product and building materials reuse and wasted food recovery assets.

3. Strengthen Ability to Recycle & Recover Energy

Recycling (including composting) is currently the primary method of waste diversion and will continue to play a significant role into the future with the ongoing consumption of products, and the generation of packaging waste and inedible food scraps. Energy recovery from organic waste materials is a valuable means of producing renewable energy and offsetting climate altering emissions.

Challenges to Overcome

- lack of processing capacity, infrastructure or technology to make it viable;
- lack of sufficient market capacity, stability or demand for downstream uses of recycling materials;
- high capital and operating costs;
- inadequate or insufficient space for facilities and containers, and lack of convenience;
- insufficient knowledge or motivation by those who are generating materials that need to be diverted.

Directions for the Community

- ❑ **Expand Extended Producer Responsibility programs:** expanding existing and developing new provincial EPR programs.
- ❑ **Develop closed-loop processes:** developing more closed loop rather than open loop⁶ processes introducing new opportunities for local businesses to create more circular supply chain networks.
- ❑ **Invest in new recycling assets:** researching, developing and investing in new technologies, applications, infrastructure, services and local markets to adapt to products and materials with increasingly complex properties and changes in material flows.
- ❑ **Support new and expanded policies:** expanding supportive regional and senior government policy and regulation.

⁶ Open Loop Recycling - The conversion of material from one or more products into a new product, involving a change in the properties of the material itself (i.e. recycling plastic bottles into plastic drainage pipes).

CITY ACTIONS

The City plays a crucial role in helping stimulate, support and enable Vancouver in becoming a zero waste community. The City can provide leadership through forward looking policies and actions, collectively referred to in this strategic plan under the heading City Actions. They are broadly organized into three groups, as follows:

1. **Priority Actions** – actions initiated while Zero Waste 2040 was being developed, and which will soon get underway. They are considered the highest level current priorities necessary to address the most significant waste flows being disposed and to leverage existing opportunities including those in support of the 2020 target.
2. **Transformative Actions** – ‘iconic’ initiatives designed to stimulate and sustain significant momentum towards zero waste. Proposed Transformative Actions include a description of priority next steps to be carried out as part of implementing the plan.
3. **Enhanced & Expanded City Roles** – a variety of strategic interventions for detailed consideration and planning organized in the following groupings: *Influence, Support, Lead by Example*.

Further details are provided below. As part of implementation planning for Zero Waste 2040, technical and business case analysis will be undertaken, and in some cases, additional consultation may be needed around implementation. Programs, projects, and policy changes and associated funding requirements will be brought forward to Council for consideration as part of the annual budget process, the capital planning process and/or special approvals, as required.

Priority Actions

The priority actions, outlined below, focus on further movement towards the City’s 2020 target of reducing waste disposed by 50% compared to 2008. Some of these actions presented address immediate waste diversion system challenges and opportunities, whereas others will help lay the necessary ground work to progress over time.

Priority Actions Addressing Construction & Demolition Waste



Demolition, land-clearing and construction waste accounts for approximately 50%⁷ of all waste recycled in Vancouver and 43% of all waste disposed to landfill and incinerator. While significant progress has been made in the diversion and recovery of materials from the built environment, these continue to be the greatest contributor of total waste disposed from Vancouver at about 158,000 tonnes per year. Proposed Priority Actions targeting C&D waste include both policy and operational initiatives that drive wasted wood and other recoverable materials such as metal and soil, to reuse, recycling and energy production opportunities. By pursuing these Priority Actions, it is estimated that upwards of 40,000 tonnes of C&D materials could be diverted annually.

⁷ Using the regional breakdown of recovered waste by sector. Metro Vancouver – Integrated Solid Waste and Resource Management Plan Biennial/5 Year Progress Report (November 2017)

1. Develop a plan to recover wood and produce biofuel from demolition materials at the Vancouver Landfill

The City has been conducting studies to determine the opportunity and feasibility of processing and recycling C&D materials at the Vancouver Landfill. In late 2017, staff began pilot testing a system to recover and process wood waste from mixed loads of C&D materials received, for the purpose of producing a biofuel replacement for coal in the production of cement. This Priority Action involves testing the material produced during the pilot as a biofuel, identification and analysis of options for scaling-up pilot facility processing capacity, preparing a business case, and the development of a plan for a long term solution for C&D processing at the Vancouver Landfill. This is a first step in transforming the City's residuals management business operations (refer to Transformative Action #1). The results of this work and recommendations for moving forward will be brought to Council for approval, expected in early 2019. This action is directly aligned with Vancouver's C&D Waste Diversion Strategy and supports GCAP's Climate Leadership and Green Economy Goals, as well as the City's Green Operations Plan.

2. Expand Green Demolition By-Law

In 2014, as part of the Heritage Action Plan, Council approved a set of recommendations aimed at encouraging reuse and recycling of demolition waste from pre-1940 homes. Also approved was a minimum recycling and reuse rate for pre-1940 homes of 75%, and 90% for pre-1940 homes that have character status. These requirements formed the basis of the City's Green Demolition By-Law, which in 2015 Council endorsed to expand to include newer homes, incrementally over time, as well as incentives to encourage more deconstruction and reuse. This Priority Action proposes to expand the Green Demolition By-Law to pre-1950's homes in the near term and ultimately to all homes at some point of time in the future and require pre-1910 and heritage registered homes be deconstructed with performance requirements to salvage wood. The expansion of this by-law has the potential to divert an additional 8,000 to 10,000 tonnes of demolition materials from landfill and incineration annually. A final expansion of the Green Demolition By-Law to apply to all homes is planned when it is determined there is adequate reuse and recycling materials for market capacity and demand. This action is directly aligned with Vancouver's C&D Waste Diversion Strategy.

3. Identify and pursue options to support and grow the market for salvaged deconstruction materials

Over the past several years there has been growing demand for salvaged old-growth wood, but there is more work to be done to identify market opportunities and gaps for other materials, and identify options for the City to help grow market demand, including for materials from newer homes, infrastructure development and other built environment assets. Accordingly, this Priority Action involves identification and mapping of material flows and redistribution 'assets' involving salvaged construction materials and product reuse, donation, repair and sharing, to better identify gaps/opportunities for further development, as well as inform potential users of their existence encouraging their use. This action may result in the City providing further support through the Green Demolition By-Law, provision of space at the Zero Waste Centre and/or Landfill, supporting the creation and operation of reuse organizations and hubs, research and removing regulatory barriers, and amending the City's purchasing practices as noted in Appendix 5: Detailed Listing of Emerging Enhanced and Expanded City Roles. This action supports GCAP's Lighter Footprint and Green Economy Goals and Healthy City Strategy.

Priority Actions Addressing Wasted Organic Materials



When C&D waste tonnes are excluded from the total tonnes of materials disposed from Vancouver, the largest single component of residential, business and institutional sector garbage is compostable food and food soiled paper, at 29%⁸ or about 81,000 tonnes annually. To address this issue, Priority Actions involve pursuing system improvements across the Zero Waste Approach for Vancouver, including options to reduce the wasting of edible food, and assessing the option of the City contributing to regional organic waste processing and renewable energy production capacity.

4. *Identify and plan organics processing opportunities*

This Priority Action involves evaluating organic waste processing options the City may choose to pursue, for the purpose of diverting and producing renewable energy from inedible food, food soiled paper and yard trimmings still disposed as garbage, currently totalling approximately 88,000 tonnes per year from all sectors. The planned work includes reviewing options regarding different project delivery, capital funding and business operating models including public-private-partnerships. This action forms part of a broader Transformative Action to review, plan and develop materials recovery and processing capacity at the Vancouver Landfill and/or alternate sites in order to refocus the Landfill's business operations to further support Zero Waste priorities (refer to Transformative Action #1). Recommendations on the best means of moving ahead with a project, including funding, will be brought to Council for approval as a separate report. This action aligns directly with Vancouver's Renewable City Strategy (increase the supply of renewable energy) and supports GCAP's Climate Leadership Goal.

5. *Identify and pursue options to improve food rescue and redistribution systems*

This Priority Action involves developing an inventory of food rescue, storage and redistribution 'assets' within the city, and mapping the flow of materials to and from these assets with the aim of reducing the disposal of edible food. This work will require stakeholder engagement to identify system gaps and opportunities for further development, will build on the work of agencies such as [Food Stash Foundation](#) and others, and will inform and connect potential users of available assets, and identify work needed to encourage and enable food rescue and redistribution. This action could result in the City taking an increased supportive role as referred to in Appendix 5: Detailed Listing of Emerging Enhanced and Expanded City Roles. This action also supports Vancouver's Food Strategy, Healthy City Strategy and GCAP's Green Economy and Lighter Footprint Goals.

Priority Actions Addressing Consumer Goods



Products of all types currently make up about 27% of waste disposed. This category of waste is comprised of various material types, however paper and mixed plastic make up approximately 20% and 23% of the products and packaging focus area, respectively. The remaining materials include items such as textiles, household hygiene products, non-compostable organics, and various laminates and mixed materials, including single-use items. Priority Actions comprise individual projects targeting specific material streams. In addition to contributing to the goal of zero waste, each of these actions also support GCAP's Lighter Footprint and Green Economy Goals.

⁸ Metro Vancouver 2016 Waste Composition Monitoring Program, December 2016

6. Implement Single-Use Item Reduction Strategy

The Draft Single-Use Item Reduction Strategy includes bold actions to reduce the use of disposable cups, plastic and paper bags, take-out containers, and disposable straws and utensils. The final strategy is expected to include a recommendation to ban the use of expanded polystyrene foam cups and containers by food vendors. With growing awareness of environmental issues associated with single-use items, we expect the coming years will be a time of rapid change in business practices, consumer behaviour, and technology. Further consultation with stakeholders is needed to implement the actions outlined in the draft strategy. This Priority Action is discussed in more detail under Transformative Action #3.

7. Expand Community Zero Waste Drop-Off Events

The City began piloting Zero Waste Drop-Off Events in 2014 with the goal of making recycling more convenient for residents and to help reduce illegal dumping. Various community groups and volunteers participate to help make these events a success, which have now collected almost 100 tonnes of materials from sites throughout the city. Over the years, these events have increased in frequency, location, quantity and types of materials accepted, and to include a reuse and repair component. This action will focus on additional expansions of the program through partnerships with local service providers, charitable organizations and product stewardship organizations to promote greater reuse, share and repair of products, and related skills building and green jobs.

8. Develop New Reduction, Diversion & Recovery Strategies Targeting Paper and Plastic

Focussed effort is needed to address the significant quantities of paper and plastic still disposed to landfill and incineration, with particular focus on commercial and institutional waste streams. Paper disposed as waste can be recovered and digested to produce renewable natural gas, along with other organics. More than one half of plastics still disposed as waste are recyclable and the remainder could potentially be recovered for other uses, such as plastic lumber or as an additive to asphalt. Developing new strategies for these materials will involve identification of barriers to diversion through existing recycling programs, review and development of options for increasing by-law and disposal ban enforcement, design of community based social marketing tactics, and consideration of infrastructure options which could be developed by the City. This action will consider a range of options that could be applied across the Zero Waste Approach for Vancouver, for both paper and plastic.

9. Identify and pursue options to support and grow product reuse and sharing

The first step to increase the reuse and sharing of products is to increase understanding of how residents and businesses engage in those activities now. A Zero Waste Assets Inventory will identify organizations in Vancouver that enable residents and businesses to avoid and reduce the amount of solid waste they generate, such as by facilitating product donation, exchange, resell, reuse, repair, sharing, and learning repair and maintenance skills. The inventory will inform next steps for growing and supporting a robust and effective network of zero waste assets (e.g. by identifying gaps and opportunities for further development) and enable measurement of progress in this area. Eventually this inventory can be used to populate a public database of zero waste assets to inform potential users of their existence and encourage their use.

10. Develop an Apparel Waste Reduction Strategy

Textiles are estimated to be one of the fastest growing waste streams, and currently constitute about 4% of Vancouver's waste, including 6,500 tonnes of apparel. Donation bins can be a convenient apparel waste diversion option for residents, but they often attract illegal dumping of waste materials and complaints about donation bins have increased. In addition to generating waste, the global apparel industry is resource-intensive and a major source of water pollution and GHG emissions, which makes reducing apparel consumption a key opportunity for decreasing Vancouver's ecological footprint. Since 2016, the City has participated in the Leverage Lab Collaborative for textiles, a multi-stakeholder problem-solving initiative that brings industry, government and non-profit organizations together to understand the challenges and opportunities for reducing apparel waste. In late 2017/early 2018 this process led to City staff co-authoring a research paper with Metro Vancouver that describes how apparel waste is managed in Vancouver (including mapping the material flows) and identifies opportunities for transitioning towards 'circular fashion'. Developing an Apparel Waste Reduction Strategy will involve consultation with stakeholders and the public to identify how the City can support reduced generation of apparel waste and increased diversion from disposal, as well as continued collaboration with Metro Vancouver.

Priority Action for City to Lead by Example



While Vancouver pursues the goal of zero waste, it is crucial that the City 'walks the talk' within its own operations, creating a model for others outside the organization to replicate. In recent years the City has achieved enormous success in reducing the amount of waste disposed, following the introduction of a green operations policy, the roll out of 'zero waste stations' in nearly every City facility, and the introduction of awareness and education initiatives for City staff. In 2017, the City diverted more than 80% of materials generated in its facilities through zero waste stations (primarily paper, plastics and organic material), which is comparable to many leading zero waste organizations. However, diversion is only part of the overall equation for getting the City to zero waste and more effort is needed to avoid and reduce the generation of waste within City operations and put materials to their best use and keeping them in circulation longer.

11. Develop a Green Operations Zero Waste Plan

Building on the City's strong organizational capacity and existing operational success, an internal Green Operations Zero Waste Plan will define and prioritize the long term directions and actions necessary for such a large and diverse organization to become zero waste before 2040. This plan will span the entire organization and hone in on areas that can make the greatest contribution towards zero waste and a circular economy; initiating necessary changes in policies, procedures, systems and behaviors. This plan could include initiatives such as:

- Achieving a high level of salvage and recycling when demolishing or deconstructing City-owned buildings, and through our infrastructure construction practices;
- Considering end-of-life recyclability and incorporating reused materials when we develop new facilities and spaces;
- Using only reusable plates, cups and cutlery for City meetings and events. Avoiding bottled water and other individually packaged food would be discouraged. Where feasible,

food choices could reflect local, low carbon and salvaged food with a plan to ensure unused food does not go to waste.

- Procurement policies that reflect zero waste and reduced consumption principles, including developing a list of caterers that can provide zero waste food services;
- Exploring the use of environmental rating systems to track and reduce the amount of waste on infrastructure projects.

The planning process will be led by the City’s Sustainability Group with involvement from the Green Operations Committee, which is made up of representatives from every City department; ensuring the plan can be effectively implemented across the organization. This action directly supports the City’s Green Operations Plan.

Transformative Actions

Deep-rooted zero waste challenges faced by all sectors in Vancouver need ambitious and bold action. Transformative actions are distinguished by radical breakthroughs in paradigms, beliefs and behaviour. Transformative actions are characterized as undertakings which:

- Shift values and beliefs to alter consumer behaviour away from the ‘*take-make-consume-dispose*’ paradigm, thereby stimulating a local circular economy;
- Promote and build zero waste knowledge and ideas that challenge the status quo;
- Integrate leading zero waste practices into business standards promoting greater avoidance, reduction and reuse of materials;
- Make and attract investment in innovative solutions and fill infrastructure gaps needed to reduce the disposal of materials.

The following proposed Transformative Actions are based on stakeholder discussions, Advisory Panel input, and staff research and will be assessed and developed in more detail as part of the strategy’s implementation planning, and brought to Council for approval as required.

1. *Refocus Operations of Vancouver Landfill to Recovery & Diversion Over Disposal*



Description:	<p>The Vancouver Landfill is a leading municipal solid waste disposal facility incorporating various operations which complement its core landfilling function. Examples include a yard trimmings composting facility, an extensive residential drop-off recycling centre, and a landfill gas collection and bioenergy utilization operation. Building on these achievements, there is opportunity to pursue new actions to transform the Vancouver Landfill to a resource recovery centre.</p> <p>Current technology options for recovering and processing materials under consideration include: construction and demolition materials recovery (refer to Priority Action #1), organic materials processing (Priority Action #4), and materials recovery from mixed waste (Priority Action #8), each with options for the production of biofuel. Combinations of different approaches are also being considered.</p> <p>This Transformative Action #1 involves a detailed analysis of these options leading to business case development, and planning and recommending an approach to Council. Planning will also consider options for establishing a zero waste research and education centre of excellence at the Vancouver Landfill, and soil</p>
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	blending/production options utilizing waste soils from Engineering's Streets, Water and Sewer Operations. In addition to contributing to the goal of zero waste, this action is aligned with and supports various other strategies and goals, including Renewable City Strategy, C&D Waste Diversion Strategy, GCAP's Green Economy Goal and the City's Green Operations Plan.
Objectives:	<ul style="list-style-type: none"> To reposition the City's existing solid waste disposal business operations and infrastructure to reduce and ultimately eliminate the reliance on landfilling for residual waste generated in Vancouver. Recover materials of value from waste without undermining source separation as a higher priority. Provide and maintain a base level of processing capacity for key waste streams.
City Roles:	<ul style="list-style-type: none"> Review waste streams, risks and opportunities; assess recovery, technology and business options; prepare/assess business case; collaborate with the City of Delta and Metro Vancouver on preferred options; develop recommended funding approach; seek Council approval; implement approved solution(s).
Case Study Examples:	<ul style="list-style-type: none"> Anaerobic digestion of organic materials: Avonmouth UK, Ljubljana Slovenia, San Jose California, Edmonton Alberta (under construction), Surrey British Columbia, Toronto Ontario Construction and demolition materials processing and biodrying of organics to produce fuel: San Jose California Mixed waste processing: San Jose California, Bury UK, Ljubljana Slovenia, Edmonton Alberta
Next Steps:	<ul style="list-style-type: none"> Next steps involve a more detailed analysis of options, multi-criteria prioritization of opportunities, business case analysis, an assessment of risks and rewards associated with different financing and operating models, and reporting back to Council with recommendations.



2. Become a Leading City in Food Waste Prevention

Description:	<p>While significant progress has been made in Vancouver and across the region with increasing the diversion of compostable organic materials from garbage, focus now needs to expand to preventing the wasting of food in the first place. In the Vancouver region about 50% of food wasted at home is avoidable due to over purchasing, not consuming prior to expiry, and from discarding left overs⁹. Other studies show that the problem of wasted food is just as bad or worse in commercial and institutional settings when food is produced, processed, transported, sold, prepared and served¹⁰. Wasted edible food is found disposed in residential and commercial green bin programs and in garbage.</p> <p>The National Zero Waste Council is initiating a Canada-wide food waste prevention campaign and is soliciting interest from potential municipal partners. This consumer behaviour change campaign will be known as Love Food Hate Waste (LFHW) Canada and builds on the Metro Vancouver LFHW campaign. Zero Waste 2040 Transformative Action #2 involves becoming a campaign partner with LFHW Canada, and using that campaign as a platform to promote and support food waste prevention</p>
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⁹ www.lovefoodhatewaste.ca

¹⁰ Gooch, M., Felfel, A., & Glasbey, C. (2014, December) Food Waste in Canada – \$27 Billion Revisited. Value Chain Management Center. Retrieved from www.vcm-international.com/new-report-annual-food-waste-in-canada-is-31-billion/

	in all sectors across the food supply chain as a comprehensive food waste prevention program. This action is considered a tremendous collaboration opportunity to demonstrate municipal leadership in the fight against food waste. This action also supports Vancouver's Food Strategy, Healthy City Strategy and other GCAP goal areas including Lighter Footprint.
Objectives:	<ul style="list-style-type: none"> • Reduce the wasting of edible food • Align program with the City's commitment to a just and sustainable food system, climate change reduction objectives, and Zero Waste 2040 actions aimed at improving and growing food rescue and redistribution systems in Vancouver, so as to amplify outcomes. • Become a leading City in food waste prevention with a program that other cities can learn from and replicate.
City Roles:	<ul style="list-style-type: none"> • Plan, design and implement the program, utilizing community based social marketing and program design expertise. • Leverage leading work already underway in other jurisdictions, including the new national level Love Food Hate Waste Campaign administered by the National Zero Waste Council. • Implement standards within City operations as part of the Green Operations Zero Waste Plan, and roll-out campaign across all sectors in Vancouver.
Case Study Examples:	<ul style="list-style-type: none"> • National Zero Waste Council and Metro Vancouver Love Food Hate Waste Campaign (www.lovefoodhatewaste.ca/) • Center for Food Loss and Waste Prevention (www.furtherwithfood.org/) • Lean Path (https://www.leanpath.com/) • ReFED (http://www.refed.com/?sort=economic-value-per-ton) • Better Ate Than Never, Save the Food campaign (https://www.adcouncil.org/Our-Campaigns/Family-Community/Reducing-Food-Waste) (http://www.savethefood.com/) • Food Waste Alliance (http://www.foodwastealliance.org/) • United Nations Food Save Initiative (http://www.thinkeatsave.org/)
Next Steps:	<ul style="list-style-type: none"> • Convene a working group of City from across the City, and with input from Vancouver Economic Commission and the National Zero Waste Council's Food Working Group, to develop and evaluate the concept, and prepare a scope of work for integration into Zero Waste 2040 implementation plans.

3. Implement a Single-Use Item Reduction Strategy



Description:	<p>This significant undertaking is considered a Priority Action and involves implementing a strategy aimed at reducing the use and disposal of single-use shopping bags, disposable cups, take-out food containers, and straws and utensils. Key actions proposed in the draft strategy include:</p> <ul style="list-style-type: none"> • Introduce a requirement for businesses that use disposable cups and plastic/paper shopping bags to develop reduction plans for these items, with options; • A ban on the distribution of polystyrene foam cups and take-out containers from food vendors; • Restrictions on automatically providing disposable straws and a requirement for food vendors to ask if customers would like a straw; • A recommendation to investigate options for the City to recover the costs of collecting disposable cups and take-out containers in public waste bins and as
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	<p>litter through an appropriate mechanism from businesses that generate this waste;</p> <ul style="list-style-type: none"> • Introduce a requirement for single-use cups and containers to be recyclable or compostable; • A future action to require businesses to recycle single-use items, contingent on development of recycling markets. <p>This action also supports GCAP's Lighter Footprint and Green Economy Goals.</p>
Objectives:	<ul style="list-style-type: none"> • Alter business, marketing and packaging design practices resulting in less single-use item waste. • Alter consumer behaviour to reduce demand for disposables, increase demand for reusable options, and ensure that any disposables used are recycled or composted appropriately.
City Roles:	<ul style="list-style-type: none"> • Establish baseline information and research alternatives. • Engage stakeholders in the development of options. • Design and implement a strategy to enable the transition of business practices and consumer behaviour, including influencing and supporting programs and regulation, and leading by example. • Gather data during implementation and report back on appropriate measures and targets. • Implement single-use item reduction policy standards within City operations as part of a Green Operations Zero Waste Plan.
Case Study Examples:	<ul style="list-style-type: none"> • Ireland's plastic bag tax, which is now 0.22 Euro (\$0.34 Canadian), has reduced plastic shopping bags by 96% since 2002. https://www.dccae.gov.ie/en-ie/environment/topics/waste/litter/plastic-bags/Pages/default.aspx • San Francisco and over 100 other cities in the US have banned the use of polystyrene foam cups and containers. https://sfenvironment.org/sites/default/files/fliers/files/sfe_zw_polystyrene_faq.pdf • In Portland, the Go Box program offers reusable take-out containers that are shared by several restaurants. https://www.goboxpdx.com/ • New York City's health code allows customers to bring their own reusable containers to approved quick service restaurants https://www.epa.gov/sites/production/files/2017-02/documents/reducingtakeoutpackagingwaste.pdf • Seattle requires all food service packaging to be compostable or recyclable (with some exceptions), and requires food service businesses to provide on-site recycling and compost collection. http://www.seattle.gov/util/forbusinesses/solidwaste/foodyardbusinesses/commercial/foodpackagingrequirements/
Next Steps:	<ul style="list-style-type: none"> • Refer to Single-Use Item Reduction Strategy report to Council (RTS 12140) and Priority Action #6

4. Develop a Zero Waste Building Program



Description:	<p>While there are various green building design standards and certification programs, there is an opportunity to develop a comprehensive zero waste program for the <i>design, construction, operation and end-of-life management</i> of buildings, infrastructure and other built environment assets in Vancouver, to support the</p>
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	<p>evolution of current thinking, planning and operations beyond recycling programs and towards a more circular economy. This will be achieved with input from design professionals, academic institutions, building product manufacturers and suppliers, and construction and recycling associations, and can leverage green building tools and standards, such as building Life-Cycle Assessment (LCA) and Environmental Product Declarations (EPDs). Lessons learned from the process of developing a zero waste program for buildings could be applied to other product categories and sectors, such as consumer goods, in support of other Zero Waste 2040 actions. In addition to supporting the goal of zero waste, this action is aligned with the City's C&D Waste Diversion Strategy, the Zero Emissions Building Plan, and many of the GCAP Goals.</p>
Objectives:	<ul style="list-style-type: none"> • Develop together with stakeholders a clear, shared understanding of waste properties and flows in the local built environment life-cycle, and identify key opportunities to reduce waste, close supply-chain loops, and create economic and environmental benefits. • Alter design practices to avoid and reduce waste and create designs that promote characteristics such as reparability, reusability, scalability, and flexibility. • Inspire the design community to come up with solutions that spur Vancouverites into embracing a zero waste lifestyle. • Raise awareness of and promote new design and construction practices in support of zero waste principles. • Create synergies with other City priorities in buildings, such as reducing embodied emissions, improving resilience and adaptability, improving indoor air quality, reducing construction and operations costs, and strengthening the local economy. • Create a program that can be adopted and built upon by other public and private sector organizations within and outside Vancouver.
City Roles:	<ul style="list-style-type: none"> • Convene stakeholders and facilitate development of a program, with the assistance of a consultant with expertise in green building design, operations, and certification. • Leverage green building tools, standards, and certification programs and related leading initiatives including the City's Green Building's Program and Green Demolition By-Law Update report to Council (RTS 12213). • Implement program within City operations as part of a Green Operations Zero Waste Plan. • Document and provide program to other public and private sector organizations for adoption.
Case Study Examples:	<ul style="list-style-type: none"> • London Waste and Recycling Board (LWARB) Circular Economy Routemap, Built Environment Section (https://www.lwarb.gov.uk/what-we-do/circular-london/circular-economy-route-map/) • NYC / American Institute of Architects New York Zero Waste Design Guidelines (www.zerowastedesign.org/) • Leadership in Energy and Environmental Design (LEED) (https://new.usgbc.org/leed) • TRUE Zero Waste Certification Program (https://true.qbci.org/)
Next Steps:	<ul style="list-style-type: none"> • Convene a working group of staff from across the City to consider and evaluate the concept, and prepare a scope of work for integration into Zero Waste 2040 implementation plans.

5. Develop a Template Zero Waste Procurement Standard



Description:	<p>This initiative involves convening supply chain and design professions, academic institutions, and manufacturing, construction and recycling trade associations to develop a Template Zero Waste Procurement Standard, to stimulate supply and demand in support of a circular economy and raise awareness in Vancouver of industry best practices.</p> <p>The initial focus will be on a standard applicable for the City's procurement of goods and services, which could then be adopted for use by other sectors and material types including construction, food and food services. This standard would support the continued implementation of the Sustainability section of the City's Procurement Policy. This action is aligned with the City's Green Operations Plan and has the potential to also support other GCAP Goals.</p>
Objectives:	<ul style="list-style-type: none"> • Alter purchase decisions to avoid and reduce waste, promote greater reuse, repair, share of products and materials and greater use of recycled content. • Create greater demand for reusing, repairing, leasing and other forms of sharing products and materials, stimulating markets to provide said services, support a circular economy and green jobs. • Increase demand for materials and products with the highest recycled material content. • Create a standard that can be adopted and built upon by other public and private sector organizations within and outside of Vancouver.
City Roles:	<ul style="list-style-type: none"> • Convene stakeholders and like-minded partners to facilitate development of standard. • Develop standard for zero waste procurement in a municipal context with input from interested stakeholders. • Implement standard within City operations as part of a Green Operations Zero Waste Plan (Priority Action #11). • Develop a business case for zero waste procurement to assist other organizations to adopt a standard.
Case Study Examples:	<ul style="list-style-type: none"> • ISO 20400:2017 - Sustainable procurement – Guidance (www.iso.org/standard/63026.html) • Zero Waste Scotland – Sustainable and circular procurement (zerowastescotland.org.uk/content/sustainable-procurement) • United States Environmental Protection Agency (EPA) – Zero waste procurement best practices - (www.epa.gov/transforming-waste-tool/procurement-best-practices-start-early-and-provide-zero-waste-information)
Next Steps:	<ul style="list-style-type: none"> • As part of Zero Waste 2040 implementation planning, convene a staff working group to develop the concept, prepare a scope of work and project plan, and secure project management resources to carry out the project.

6. Form a Zero Waste Innovation Fund with Like-minded Partners



Description:	<p>The development of a Zero Waste Innovation Fund involves a partnership led by the City and Vancouver Economic Commission with institutions and businesses. The fund will provide financial support to various stakeholders in Vancouver to incubate</p>
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	<p>and support development of new, altered and innovative zero waste technologies, processes and business concepts from research and development to the marketplace. Experience gained from the City's Green & Digital Demonstration Program and Social Enterprise Street Cleaning Grants Program will be leveraged in the design of the program. This action is aligned with GCAP's Green Economy Goal and would support low threshold employment.</p>
Objectives:	<ul style="list-style-type: none"> • Accelerate the transition to a circular economy along with eliminating waste by improving (and in some cases transforming) how goods and services are designed, manufactured and used. • Support research and development that will accelerate technology, knowledge transfer, and commercialization of innovative products, processes and services. • Facilitate the growth and expansion of zero waste business models and markets in Vancouver. • Attract and retain talent and large scale investments in the area of zero waste to Vancouver. • Generate social, health, environmental and/or economic benefits for Vancouverites, including better training and improved skills for highly qualified personnel, and create low threshold employment opportunities, through appropriate pathways. • Advance research, and technology development and demonstration.
City Roles:	<p>Establishing the fund:</p> <ul style="list-style-type: none"> • Identify and pursue opportunities for leverage and/or create alignment with complementary programs, such as Vancouver Green & Digital Demonstration Program. • Work with the Vancouver Economic Commission to bring together partners to secure funding commitments and form or assign the administering organization and its mandate and governance. • Work with the Vancouver Economic Commission and fund partners to design and develop the fund program. <p>Administering the fund:</p> <ul style="list-style-type: none"> • Participate in the administration of the application process and allocation of funds with input from fund partners.
Case Study Examples:	<ul style="list-style-type: none"> • Vancouver Greenest City Fund / Green Grants (www.vancouver.ca/people-programs/green-grants.aspx) • Vancouver Building Energy Retrofit Fund (www.vancouver.ca/news-calendar/new-fund-to-spur-energy-efficiency-upgrades-for-buildings.aspx) • Vancouver Green & Digital Demonstration Program (www.vancouvereconomic.com/gddp/) • Canada Foundation for Innovation (www.innovation.ca/) • Sustainability Victoria Australia Grants & Funding Program (www.sustainability.vic.gov.au/About-Us/Grants-and-Funding) • WRAP (Waste and Resources Action Programme) Funding Program (http://www.wrap.org.uk/category/what-we-offer/funding)
Next Steps:	<ul style="list-style-type: none"> • Engage with Vancouver Economic Commission to secure their partnership, fully develop and evaluate concept, identify interested partners and funding priorities, and prepare a recommended governance and fund administration framework with a report back to Council for implementation approval.

Enhanced & Expanded City Roles

Transformative moves alone will not enable Vancouver to reach zero waste; strategic intervention by the City is essential across a number of fronts. These interventions or actions require the City to enhance its existing roles and pursue new ones, and are grouped as follows. Appendix 5 lists various proposed enhanced and expanded City roles based on stakeholder input and staff research, and will be evaluated and planned in greater detail as part of Zero Waste 2040 implementation planning.

Influence	By utilizing the authority set out by the Vancouver Charter, regulation, fiscal measures and other policy tools can be utilized to set minimum requirements for zero waste practices.
<p>Bylaw Regulation & Fiscal Measures - Disincentives and incentives such as municipal bylaws, enforcement and different forms of fiscal stimulus (e.g. taxes, fees and grants), can be effective measures to support existing, and drive new, zero waste and circular economic behaviours and activities. When exploring the effectiveness of regulatory options, consideration will be given to accompanying supportive roles, the most appropriate form of intervention, lead time necessary for those impacted to plan and adapt, enforceability and level of enforcement required and sequencing of new regulations.</p>	
Support	In a supportive role, the City can provide, enable and grow systems, capacity, innovation and incentives necessary to support residents, businesses and community organizations in Vancouver to achieve zero waste through communications and engagement, research, planning, data collection, infrastructure, programs and services.
<p>Collaboration, Communications, Engagement - Overcoming the challenges and realizing the opportunities facing Vancouver stakeholders in the pursuit of zero waste requires dialogue and collaboration with industry, residents, academia, community organizations and all orders of government. The City will play an instrumental role in convening, facilitating and participating in collaborations aimed at tackling key zero waste challenges in Vancouver, while also contributing to dialogue on a scale beyond Vancouver. Communication and engagement across all sectors will be needed to support the necessary shifts in the community's values, beliefs and behaviours in alignment with zero waste.</p>	
<p>Research & Planning - In the continuously evolving field of zero waste and the circular economy, research can prove to be a useful tool to identify sources of wasteful behaviour, validate the benefits of zero waste and circular economy approaches and practices, characterize emerging trends to inform future planning needs, and identify infrastructure and market gaps. Co-benefits/synergies with other City departments leading policies and plans that have complementary objectives will also be pursued.</p>	
<p>Data Collection & Sharing - There is a recognized lack of data (or reliable data), transparency, performance measures and targets pertaining to the generation and management of waste material resources within Vancouver. The City will play a role with recommending clear and thoughtful targets, metrics and directions to align motivations and behaviours across sectors in Vancouver towards the common goal of zero waste, and addressing data and information gaps that are pervasive across Vancouver to better track the community's progress towards zero waste and identify priorities.</p>	
<p>Infrastructure, Program & Service Delivery - Through careful and thoughtful community infrastructure development, the City can develop additional supporting urban infrastructure for a system that is more regenerative, accessible and abundant by design, with the benefit of eliminating the concept of waste. In conjunction with the development of community infrastructure, there are a number</p>	

of new or expanded programs and services the City can offer to facilitate connections between organizations, develop and scale business models that promote greater circularity of materials, and increase access for residents.

Lead by Example	By leveraging the City's purchasing power, enhancing its operating policies and procedures, utilizing its portfolio of properties and assets, and leading by example through its labour force, the City can reduce its contribution to the overall amount of waste generated in Vancouver. Formalizing the following proposed actions into a City of Vancouver Green Operations Zero Waste Plan will provide a roadmap that can be replicated and built upon by other organizations, according to their local situations, producing transferable knowledge and create opportunities for the public, social enterprise organizations, the business community, and other municipalities and levels of government.
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Leverage the City's Existing Green Operations Leadership - As a result of the Greenest City Action Plan, sustainability objectives have been incorporated into the plans of every department across the organization. Multi-departmental discussion forums facilitated by the City's Sustainability Department routinely meet to discuss challenges and opportunities and report progress towards the City's sustainability objectives. These activities create an existing framework to further zero waste objectives and progress within the City's internal operations.

Leverage the City's Purchasing Power - With the City's purchasing power, demand for reuse, share, and repair will be created, allowing 'circular' business models to take flight and sustain themselves in the Vancouver market.

Create Zero Waste Centric Operating Policies & Procedures - With new and enhanced operating policies there is an opportunity to directly reduce the amount of waste generated within the City's operations and ultimately disposed by limiting consumption of virgin material, directing material to higher and better uses and utilizing materials with greater recycled content.

Utilize City Facilities to Achieve Zero Waste - The City is one of the largest land owners in Vancouver. This visibility gives the City leverage to experiment and demonstrate zero waste initiatives, practices and outcomes within City owned and operated facilities for replication by residents and businesses in Vancouver.

Cultivate Zero Waste 'Ambassadors' - The City's large diverse workforce will be leveraged to establish zero waste 'champions', 'ambassadors' or spokespersons, to promote and demonstrate zero waste behaviours, to create a ripple effect in the form of a 'community of action' in the workplace, industry and professional associations and the communities where staff live.



Appendix 1: Built Environment Focus Area Summary

Demolition, land-clearing and construction waste accounts for approximately 50%¹¹ of all waste recycled in Vancouver and 43% of all waste disposed to landfill and incinerator. Materials generally delivered for disposal can include wood, glass, metal, plastic, concrete and soils. While significant progress has been made in the diversion and recovery of materials from the built environment, these continue to be the greatest contributor of total waste disposed from Vancouver at about 158,000 tonnes per year. Of this total, about 90,000 tonnes is comprised of demolition material loads received at the Vancouver Landfill, containing between 40 and 90% wood¹², 62,000 tonnes of mixed C&D waste from the residential and commercial sectors, and about 6,000 tonnes of yard trimmings that could be recycled with food scraps (refer to Priority Action #4).

As new buildings and infrastructure are constructed and the old are maintained, renovated, or demolished, waste materials are produced and potential resources are left underutilized. Working to recover more of these materials, in 2014 the City introduced a Green Demolition By-Law with minimum reuse and recycling requirements for deconstruction and demolition waste on houses built before 1940. In 2015, Metro Vancouver and the City of Vancouver, introduced a ban on the disposal of clean wood with garbage. These recent actions have been successful in reducing the amount of material disposed, but are focused only on buildings and not waste associated with infrastructure and other assets. There is still more to be done as we work towards zero waste.

Challenges to Overcome:

- Lack of professional knowledge and trade capacity to support zero waste design, operations and end-of-life management for buildings, infrastructure and other assets
- Lack of robust regional markets for the reuse and recycling of materials from deconstructed and demolished assets
- Lack of land and resources available to collect, store, reuse, remanufacture and resell materials
- Lack of consumer information on how to reduce construction and renovation waste

Recommended City actions on how to address these challenges are referenced below.

Priority Actions

1. Develop a plan to recover wood and produce a biofuel from demolition materials at the Vancouver Landfill
2. Expand Green Demolition By-law
3. Identify and pursue options to support and grow the market for salvaged deconstruction materials

Transformative Actions

4. Develop a Zero Waste Building Standard Program
5. Develop a Template Zero Waste Procurement Standard (Cross Cutting)

¹¹ Using the regional breakdown of recovered waste by sector. Metro Vancouver – Integrated Solid Waste and Resource Management Plan Biennial/5 Year Progress Report (November 2017)

¹² Metro Vancouver – 2015 Demolition, Land-clearing, and Construction Waste Composition Monitoring Program

6. Form a Zero Waste Innovation Fund with Like-Minded Partners (Cross Cutting)

Enhanced & Expanded

Refer to various proposed enhanced and expanded City roles pertaining to this Focus Area in Appendix 5 Detailed Listing of Enhanced & Expanded City Roles.



Appendix 2: Food & Packaging Focus Area Summary

Much of Vancouver's waste diversion success over the last five years can be attributed to:

- the introduction of the City's successful Green Bin program for single family and duplex homes;
- switching the collection frequency of City garbage and Green Bin collection service starting in 2013 (garbage is now collected every other week and green bins are collected weekly);
- the introduction of a ban on the disposal of food scraps as garbage in 2015 covering all properties;
- a City by-law requiring all properties to have organics diversion programs in place.

These programs have resulted in the City now collecting about twice as much organics (about 50,000 tonnes of food scraps plus yard trimmings each year) for composting compared to before the program changes and the amount of garbage collected decreasing by nearly as much. However, despite this success, nearly 16% or about 60,000 tonnes of all material disposed to landfill and incinerator from all sectors is food waste. Further, Metro Vancouver estimates that 50% (30,000 tonnes) of this is avoidable food waste¹³. On top of this, about 55,000 tonnes of food packaging, including plastic wrap, meat trays, and single-use take-out containers and drink cups is disposed annually. This demonstrates there is a lot of room to reduce the wasting of food, ensure that when food is no longer edible that it is diverted from garbage, and to reduce food packaging.

Challenges to Overcome:

- A grab-and-go and ready-made culture that increases the use of single service containers, plastic wrap, dishware, etc.
- Lack of knowledge on how to reduce food waste
- Global food markets result in a disconnect between consumers and the life cycle of foods
- Gaps in zero waste business investment and innovation
- Lack of adequate infrastructure and technology to support food effective food rescue and redistribution
- Restrictive regulations and policies across governments
- Lack of clear and comprehensive information on our food systems and their contributions to food related waste

Recommended City actions on how to address these challenges are referenced below.

Priority Actions

4. Identify and plan organics processing opportunities
5. Identify and pursue options to improve food rescue and redistribution systems

¹³ Metro Vancouver Love food Hate Waste campaign, 2017, www.lovefoodhatewaste.ca

Transformative Actions

2. Become a Leading City in Food Waste Prevention
5. Develop a Template Zero Waste Procurement Standard (Cross Cutting)
6. Form a Zero Waste Innovation Fund with Like-Minded Partners (Cross Cutting)

Enhanced & Expanded

Refer to various proposed enhanced and expanded City roles pertaining to this Focus Area in Appendix 5 Detailed Listing of Enhanced & Expanded City Roles.



Appendix 3: Products & Packaging Focus Area Summary

Products such as toys, textiles, electronics, household supplies and their associated packaging are commonly discarded. Product designers, manufacturers and retailers are continuously evolving their products and product offerings to meet consumer interests and to increase sales. When consumers are done with products they are typically disposed as garbage or collected for recycling, rather than repaired or redistributed for reuse.

The Recycling Regulation under authority of the Environmental Management Act sets out the requirements for Extended Producer Responsibility (EPR) in British Columbia. B.C. has introduced EPR programs for beverage containers, electronics, paint, used oil, tires, batteries, and more recently packaging and printed paper from the residential sector. In each of these EPR programs, companies are required to set up and pay for recycling programs for the products and packaging they make and sell; resulting in a significant amount of diversion of these materials from landfill and incinerator.

Locally, products and product packaging makes up about 27% or 163,000 tonnes per year of total materials diverted from disposal and the majority of those materials are captured in EPR programs. Of the 99,000 tonnes of all product waste disposed to landfill and incinerator, the majority is paper (20%), plastic (23%) and a diversity of other products including textiles and apparel (16%), rubber, metal and composite materials (41%). Despite the success of EPR programs for product and packaging materials, there is still a lot of room for improvement to reduce the generation of these items as waste and capture more of them for recycling.

Challenges to Overcome:

- Consumer drive for the latest goods, technologies and products that are designed with planned obsolescence
- Current regional economy does not include all aspects of a products life cycle which is important for a circular economy
- Knowledge disconnect between designers, producers and waste managers
- Gaps in zero waste business investment and innovation
- Disconnects between the current infrastructure and technology to dispose of materials and the upstream development of products

Recommended City actions on how to address these challenges are referenced below.

Priority Actions

6. Implement Single-Use Item Reduction Strategy
7. Expand Community Zero Waste Drop-Off Events
8. Develop New Reduction, Diversion & Recovery Strategies Targeting Paper and Plastic
9. Identify and pursue options to support and grow product reuse and sharing
10. Develop an Apparel Waste Reduction Strategy

Transformative Actions

3. Implement a Single-Use Item Reduction Strategy
5. Develop a Template Zero Waste Procurement Standard (Cross Cutting)
6. Form a Zero Waste Innovation Fund with Like-Minded Partners (Cross Cutting)

Enhanced & Expanded

Refer to various proposed enhanced and expanded City roles pertaining to this Focus Area in Appendix 5 Detailed Listing of Enhanced & Expanded City Roles.



Appendix 4: Residuals/Disposal Focus Area Summary

If discarded materials are not kept in circulation and reused or recycled, they are collected, transferred and disposed to landfill or incinerator. The majority of waste originating from Vancouver and collected either by City forces or private sector waste haulers is transferred through the Vancouver South Transfer Station (VSTS) and then disposed at the Vancouver Landfill. In 2016 a total of 371,000 tonnes of waste originating from Vancouver was disposed as residual.

The Vancouver Landfill, located in the City of Delta and owned and operated by the City of Vancouver, and receives waste from across the Metro region. In 2016, a total of almost 750,000 tonnes of materials was disposed to the Vancouver Landfill. Since the Landfill is the only operating municipal solid waste landfill in the Metro Vancouver region, preserving its capacity is of great importance to the City and Metro Vancouver. The current landfill operating agreements with Metro Vancouver and the City of Delta expire in 2037.

Challenges to Overcome:

- Ease and convenience of disposal compared to separating materials for recycling
- Lack of harmonization of recycling programs across all sectors
- Avoiding a dependency on recovering materials from mixed waste in place of separating materials and managing them as individual streams
- Competing market forces which create a preference for disposal over processing
- Continuously adapting to the changing composition of waste
- Creating reuse and recycling markets for low valued materials

Recommended City actions on how to address these challenges are referenced below.

Priority Actions

1. Develop a plan to recover wood and produce a biofuel from demolition materials at the Vancouver Landfill
2. Expand Green Demolition By-Law
3. Identify and pursue options to support and grow the market for salvaged deconstruction materials
4. Identify and plan organics processing opportunities
8. Develop New Reduction, Diversion & Recovery Strategies Targeting Paper and Plastic

Transformative Actions

1. Refocus Operations of Vancouver Landfill to Recovery & Diversion over Disposal

Enhanced & Expanded

Refer to various proposed enhanced and expanded City roles pertaining to this Focus Area in Appendix 5 Detailed Listing of Enhanced & Expanded City Roles.

Appendix 5: Detailed Listing of Enhanced & Expanded City Roles

ACTION		 FOOD & PACKAGING	 PRODUCTS & PACKAGING	 BUILT ENVIRONMENT	 RESIDUALS / DISPOSAL	
Influence	<ul style="list-style-type: none"> Review, plan and develop City bylaw regulation supporting an improved system for wasted edible food rescue and redistribution, for value-added processing and donation from the commercial (e.g. grocers, food service, distributors) and institutional sectors (e.g. hospitals, schools, etc.) 	●				
	<ul style="list-style-type: none"> Review, plan and develop City bylaw regulation pertaining to the reduction and diversion of packaging waste (including single use items) including consideration of acceptable alternatives and reusable options 		●			
	<ul style="list-style-type: none"> Review, plan and enhance existing bylaw regulation, such as the Green Demolition By-Law, to require deconstruction, salvage and diversion from a greater number of properties undergoing redevelopment and renovation 			●		
	<ul style="list-style-type: none"> Review, plan and develop expanded City bylaw regulation regarding the types of materials requiring diversion and banned from disposal 				●	
	<ul style="list-style-type: none"> Review, plan and establish industry reporting requirements to improve transparency of Vancouver's waste profile including sources of waste, flows, types and quantities 					●
	<ul style="list-style-type: none"> Review Vancouver Charter authorities not previously exercised under City bylaw, for the purpose driving increased waste reduction and diversion 					●
Support	<ul style="list-style-type: none"> Leverage the city's 'food assets', increasing the community's capacity to grow and purchase fresh, unpackaged and untrimmed food 	●				
	<ul style="list-style-type: none"> Develop a network of 'food hubs' to fill gaps in food system infrastructure, such as transportation, product storage, and product processing supporting the consumption of fresh, unpackaged and untrimmed food and redistribution of edible food for value-added processing and donation 	●				
	<ul style="list-style-type: none"> Review, plan and develop community infrastructure for recovering healthy edible food (e.g. community fridges) 	●				
	<ul style="list-style-type: none"> Review commonly used building products to ensure buildings in the future can be deconstructed and components can be recycled 			●		
	<ul style="list-style-type: none"> Supporting the development of private and not-for-profit sector zero waste infrastructure. Examples for consideration include: <ul style="list-style-type: none"> - Maker-labs to encourage local production, reuse, repair, and distributive manufacturing - Collective resource banks to even out the demand and supply of materials - Digital applications to broker the exchange of goods, materials, and services - Lending libraries improving access to assets without ownership and greater resource utilization 	●	●	●		
	<ul style="list-style-type: none"> Explore opportunities to influence and promote zero waste behaviors with respect to: <ul style="list-style-type: none"> - Food planning and purchases - Addressing the stigma associated with rescued/donated food - 'Life transitions' (e.g. move in/out, family gets bigger/smaller, etc.) - Addressing the stigma associated with 'second-hand' products - Home and office/business maintenance and renovations 	●	●	●		
<ul style="list-style-type: none"> Conduct asset and system mapping and gap/opportunity analysis with respect to: <ul style="list-style-type: none"> - Food donation, storage, redistribution and processing - Zero waste education and skills-building resources - Product reuse, donation, repair and sharing - Zero waste education and skills-building resources - Underutilized uses/space in civic and other buildings 	●	●	●			

ACTION	FOOD & PACKAGING	PRODUCTS & PACKAGING	BUILT ENVIRONMENT	RESIDUALS / DISPOSAL	
<ul style="list-style-type: none"> Pursue opportunities to raise awareness of City zero waste policies and industry best practices, and enhance industry standards and practices with an increased focus on zero waste and circular economy, involving supply chain, design professions, academic institutions, and construction, manufacturing, salvage and recycling trade associations. Examples include: <ul style="list-style-type: none"> Consider options to digitize, lease and share instead of purchasing new; Avoid and reduce unnecessary/excess packaging; Increase reuse and sharing opportunities; Increase the recyclability of items and incorporation of recycled content in place of virgin materials; Consider flexible/multi-use and modular design; Design for repair-ability, disassembly/deconstruction at end-of-life 	●	●	●		
<ul style="list-style-type: none"> Review, plan and develop business development programs to pilot and scale up zero waste business models which promote dematerialization, reuse, repair and sharing 		●	●		
<ul style="list-style-type: none"> Review, plan and develop community events promoting reuse, share and repair through partnerships with local service providers and EPR stewardship organizations (e.g. enhanced KVS/zero waste drop off events) 		●	●		
<ul style="list-style-type: none"> Engage with Ministry of the Environment and EPR stewardship organizations on sharing data and piloting new and enhance existing programs, starting with items identified in the CCME's Canada Wide Action Plan for Extended Producer Responsibility 		●	●		
<ul style="list-style-type: none"> Review, plan and develop matchmaker programs which grow local circular relationships between organizations that have materials with those who need it (e.g. National Industrial Symbiosis Program) 		●	●	●	
<ul style="list-style-type: none"> Provide additional fixed and/or mobile depots/collection events, to receive, aggregate and transfer materials supporting new and existing source separation programs and improving access for residents and small businesses 				●	
<ul style="list-style-type: none"> Plan replacement of the current Vancouver South Transfer Station with a full scale facility designed to support zero waste 				●	
<ul style="list-style-type: none"> Provide feedstock and space for zero waste technology/process research and incubation 				●	●
<ul style="list-style-type: none"> Pilot new technologies, processes, materials and systems within City operations 					●
<ul style="list-style-type: none"> Convene industry to develop zero waste solutions to design out waste 					●
<ul style="list-style-type: none"> Research Circular Economy case studies, barriers, opportunities and strategies for Vancouver 					●
<ul style="list-style-type: none"> Conduct life-cycle analysis of material options to enable zero waste decision making 					●
<ul style="list-style-type: none"> Convene local government zero waste networks, forums, working groups and partnerships to engage with, provide leadership, share knowledge and scale opportunities 					●
<ul style="list-style-type: none"> Engage with Vancouver Economic Commission on evaluating, growing and developing new end use markets, attracting zero waste businesses and investor capital to Vancouver, track metrics, and plan and assess circular economic opportunities and strategies 					●
<ul style="list-style-type: none"> Engage with Vancouver School Board and other educational institutions on curriculum material pertaining to zero waste 					●
<ul style="list-style-type: none"> Engage with Social Enterprise organizations, Health Authorities, Business Improvement Associations, Tourism Vancouver, other industry associations to support current and pursue new zero waste collaboration opportunities 					●



ZERO WASTE 2040

WORKSHOP CONSULTATION SUMMARY



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OVERVIEW



The City of Vancouver is currently developing Zero Waste 2040, a long-term strategy to guide the decisions and waste management investments that are needed for Vancouver to achieve its zero waste goal. The Zero Waste 2040 strategy will provide a framework for Vancouver to reduce and ultimately eliminate waste disposed to landfill and incinerator.

In late 2016, residents, businesses, non-profit organizations, and other levels of government were invited to four Zero Waste 2040 workshops to provide industry expertise and public input. The input received from the workshops is currently being used alongside technical research and information from other public and stakeholder participation to inform the development of the Zero Waste 2040 strategy.

WORKSHOP SUMMARY



Over 230 people participated in four Zero Waste 2040 workshops to provide expertise and public input. The input received from residents, businesses, non-profit organizations and other levels of government during the workshop series is summarized in this document and will be used to inform the development of the Zero Waste 2040 Strategy.

The workshops covered four key systems that contribute to solid waste disposed to landfill and incinerator:

1. **Products:** consumer goods and associated packaging
2. **Food:** raw, processed and cooked food and associated packaging
3. **Buildings and Assets:** construction, building resources and municipal infrastructure
4. **Waste Management:** resources managed after the point of disposal in the systems above

The City hosted an additional workshop as part of the development of a Single Use Item Strategy. A summary of that workshop can be found at vancouver.ca/zerowaste.

WORKSHOPS

DATE	TOPICS	NUMBER OF PARTICIPANTS
September 23, 2016	PRODUCT WASTE Packaging, household appliances, clothing, household hygiene, and electronics	60
September 30, 2016	FOOD WASTE Food production, manufacturing, distribution, sales, and consumption	65
October 7, 2016	BUILDING AND ASSET MANAGEMENT WASTE Buildings and municipal infrastructure (roads, pipes, etc.)	55
October 14, 2016	WASTE MANAGEMENT Various streams of material with a post-consumer focus	54

Purpose

The purpose of the workshops were to:

- Develop a shared understanding of the current state of each system and their impact on solid waste
- Develop a high level vision for zero waste by 2040
- Identify challenges and opportunities to achieving zero waste by 2040
- Identify and share priorities and actions for how to achieve zero waste by 2040
- Invite participants to take a role in a zero waste community and future initiatives

Approach

The workshops were designed around a “now, wow, how” planning framework blended with systems thinking methods. The approach and activities in the workshops focused on:

1. System Mapping: What is the current state of waste generated in each system?
2. Visioning: What could a zero waste Vancouver look like in 2040?
3. Action Planning: How can we achieve zero waste by 2040?

WHAT WE HEARD

In the workshops, we heard healthy debate and discussion on many zero waste topics. Participants discussed a vision of what Vancouver could look like as a zero waste community by 2040, guiding principles that will shape our thinking for getting to zero waste, opportunities and challenges we may face along the way, and key priorities and actions to move forward with. Overall, seven themes emerged across all four workshops and systems.

1. TAKE A COLLABORATIVE SYSTEMS-WIDE APPROACH

Achieving zero waste is complex. It involves change through multiple layers of stakeholders, across organizational boundaries, and is beyond the ability of any one organization to effectively address it by themselves. Problems and opportunities related to zero waste require total systems changes, including collaboration between those who act locally and are impacting change globally. Participants told us that the Zero Waste 2040 Strategy needs a collaborative approach, engaging with and building on the capacity of people and organizations across key systems to collectively solve problems, pursue opportunities and transition to zero waste by 2040.

2. FOSTER A ZERO WASTE CULTURE

Vancouver is defined by its residents and their diversity, values, norms, lifestyles and ability to adapt, look forward, and be involved in shaping the city. Participants recognized the importance of these traits as both barriers to and opportunities for achieving zero waste. Participants told us that achieving zero waste will require people to be more considerate of their waste impacts and shift away from disposable consumption to a “lighter” footprint culture. Everything we need comes from the planet and the amount of productive land and resources we use to meet our needs is called our “ecological footprint”. A “lighter footprint” is about living within our ecological limits, treating waste as a resource, enhancing social equity and addressing climate change.

3. TRANSITION TO A STRONG CIRCULAR ECONOMY

Transitioning to the circular economy may be one of the biggest opportunities for re-shaping how we organize production and consumption and achieve zero waste. The circular economy represents a new way of looking at the relationships between policy, markets, people and resources. Participants in every workshop identified the need for a strong local circular economy to shift us to zero waste by 2040. A circular economy is one that values waste as a resource, is restorative and regenerative by design, keeps products, components and materials at their highest utility and value at all times, and considers social equity, affordability, accessibility and convenience in accessing circular products and services.

4. FOSTER ZERO WASTE INNOVATION

Zero waste is a philosophy, visionary goal and also an innovation. Participants recognized the need to foster innovation by enabling unconventional solutions that challenge current business models. They identified the need to create policies, services, programs, infrastructure and technology through unconventional solutions that would be effective at achieving zero waste. Participants discussed the need for us to support innovation in a wide range of sectors, including the design and management of eliminating or reducing toxic waste, increasing opportunities to conserve or recover resources, and creating solutions that don't require us to bury or burn materials.

5. SUPPORT ZERO WASTE INFRASTRUCTURE & TECHNOLOGY

New and updated government policies, programs and business models can offer options for embracing the circular economy. But as participants recognized in every workshop, it will not be possible to achieve zero waste without the necessary infrastructure, services, and information available for public and private sector use. Participants identified the need for infrastructure and technology to consider social equity, affordability, neighbourhood accessibility, and convenience.

6. DEVELOP SUPPORTIVE AND ENABLING ZERO WASTE POLICY & REGULATION

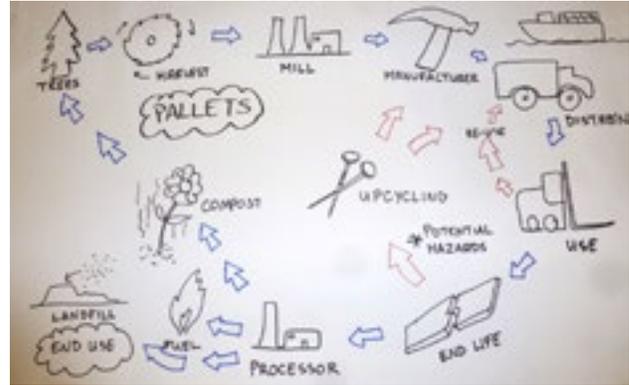
Governments have an important role to play in the shift towards zero waste. Participants expressed interest in every workshop for government policy and regulation to be streamlined and harmonized across governments, to support the transition to zero waste and local circular economies, and to balance the protection of the environment while enhancing human health and safety.

7. IMPROVING DATA COLLECTION, RESEARCH & ACCESSIBILITY

Accessible data about waste and a materials life cycle will continue to be a valuable resource in helping others to understand the importance of working towards zero waste. Participants identified the need to improve access to better information on a materials life cycle and waste to be able to better understand and then build public awareness about how to achieve zero waste. Participants told us that more comprehensive data on solid waste would help to support informed, cost-effective solutions for policies, programs and initiatives. Specifically, participants discussed the importance of improving data collection, research and information sharing on the composition, use and life cycle of materials and the measurable data that can monitor the zero waste progress made by policies, programs and services over time.

INSIDE LOOK: SYSTEMS MAPPING

To spark discussion about reducing and eliminating waste from each system, workshop participants created a system map for particular resources or materials. Each system map included the life cycle of the given resource or material, the sources of solid waste, the players in the system and levers for change. This activity allowed participants to better understand the current state of waste in each system before visioning and planning for a zero waste future.



WHAT WE HEARD

VISION OF A ZERO WASTE FUTURE

Participants were asked to envision what a zero waste Vancouver would look like in 2040.

Workshop participants provided over 100 ideas and the feedback gathered through the visioning exercise is summarized across the emerging seven key themes from all Zero Waste 2040 workshops below.

VANCOUVER WILL HAVE A COLLABORATIVE SYSTEMS-WIDE APPROACH TO ZERO WASTE

- Waste policies, programs and services are cohesive and streamlined across all governments
- Business community, residents, non-profit organizations and governments work together to take action
- Systems-wide collaboration and coordination
- People are connected to every stage of the food, product, and building cycle

VANCOUVER WILL HAVE A ZERO WASTE CULTURE

- The public are empowered by City and community led initiatives to take action towards zero waste
- Effective marketing, technology and infrastructure enables people to eat, buy, move and live in a lighter way
- Zero waste principles are integrated into all levels of public education
- People are empowered to shop differently, use reusable materials, to consume and waste less.

VANCOUVER WILL HAVE A STRONG CIRCULAR ECONOMY

- Organizational supply chains have evolved from the 'take, make, dispose' model to something circular
- "a reusable world" without single use disposable materials
- manufacturers use, design and produce only recyclable and reusable items
- Packaging for products are standardized and reusable/recyclable
- Planned Obsolescence is obsolete
- Extending the life of products
- A thriving repair, sharing and reuse economy with involvement of the whole city and new technology to support it
- The most affordable, cost effective products and services are zero waste

VANCOUVER WILL HAVE EFFECTIVE ZERO WASTE INFRASTRUCTURE AND TECHNOLOGY

- Digital innovations such as cloud computing, modular design technologies, and machine to machine
- communication have dematerialized many of today's wasted resources
- Advanced trace, return and recycling infrastructure and technology diverts any remaining material disposed from landfill and incinerator

VANCOUVER WILL HAVE SUPPORTIVE AND ENABLING ZERO WASTE POLICIES & REGULATIONS

- Extended Producer Responsibility programs are established for all material types requiring industry to account for their solid waste impact
- Local incentives are established which promote circular economy behaviour and the elimination of waste
- Enable local government to produce goods and services in a zero waste manner
- Material standards on zero waste that businesses adhere to i.e. the same procedures or product specifications to ease logistics, standardized packaging across product lines, standards to facilitate reuse and recycling etc.

VANCOUVER WILL HAVE CLEAR, ACCESSIBLE AND TRANSPARENT DATA COLLECTION AND RESEARCH SYSTEMS

- A labeling system indicate the composition of a material, component, process or service, its compliance with a zero waste standard and a symbol of the reuse / recycling stream in which it belongs
- Technologies enable communities, businesses and governments to monitor, analyze data and share information with the public
- Consumers understand how and where to dispose of an item and the implications of that decision

WHAT WE HEARD

GUIDING PRINCIPLES FOR ZERO WASTE

The City's mission statement is "to create a great city of communities that cares about its people, its environment, and the opportunities to live, work, and prosper." To guide the development of the Zero Waste 2040 Strategy, the City prepared preliminary Guiding Principles for pursuing zero waste in a sustainable manner across three pillars:

1	PEOPLE
1.1	Work collaboratively to connect and support people and achieve circular networks amongst businesses, institutions and communities
1.2	Support positive cultural changes and shared values to build a zero waste community
1.3	Engage, build awareness and educate all generations
1.4	Develop systems that are mindful of and include planning to meet the needs of all groups, including Vancouver's most vulnerable
2	PROSPERITY
2.1	Create Green Jobs and strive to become a global hub for zero waste innovation
2.2	Maintain affordability of services
2.3	Support circular economic systems and markets that 'close the loop' on wasteful systems, are restorative and regenerative by design.
2.4	Support sustainable business opportunities to eliminate, reduce and repurpose waste as resources
3	ENVIRONMENT
3.1	Give priority to waste prevention and reduction over recycling and disposal
3.2	Value waste as a resource and manage to its highest best use, and with consideration to life-cycle impacts
3.3	Consider global impacts due to local changes
3.4	Strive to manage waste locally
3.5	Protect the environment by preventing and reducing harmful environmental impacts
3.6	Support actions which achieve a lighter ecological footprint

There was robust discussion by participants' in each workshop when asked to provide ideas, input and feedback on the Guiding Principles. We collected over 100 comments for consideration including the following common concepts:

- Treat waste as a resource
- Net positivity over zero waste
- Systems thinking
- Culture shift and education
- Empowering the entire community, including all ages, generations, diverse groups, and visitors, to take action
- Indigenous inclusion and reconciliation
- Social equity and fairness
- Balance practical and ambitious circular economy opportunities
- Accessibility, affordability and convenience
- Transparent policies, programs and services
- Precautionary principle
- Protect and enhance public health, safety and the environment
- Mitigate climate change
- Adaptable and resilient policies, programs and services
- Accountability, compliance and enforcement

We are continuing to analyze and incorporate these comments into the final Guiding Principles that will be included in the Zero Waste 2040 Strategy.



WHAT WE HEARD

PRODUCT WASTE

CURRENT STATE OF PRODUCT WASTE

Products, such as toys, packaging, paper, textiles and electronics are everywhere. Product designers, manufacturers and retailers are continuously evolving their products or product offerings to meet consumer needs. When consumers are done with a product, these products are either distributed for reuse, repaired or recycled and are often disposed of as garbage.

The Recycling Regulation under authority of the Environmental Management Act sets out the requirements for Product Stewardship and Extended Producer Responsibility (EPR) in British Columbia. Over the past two decades, B.C. has introduced EPR programs for beverage containers, electronics, paint, used oil, tires, batteries, and more recently packaging and printed paper from the residential sector. In each of these EPR programs, companies are required to set up and pay for recycling programs for the products and packaging they make and sell.

Product waste makes up about 24 per cent of waste that is recycled in the region. Thirty five per cent of recycled product related waste are captured by EPR programs, 46 per cent are from institutional, commercial and industrial sector recycling, and 19 per cent are from residential and recycling depot drop offs. Of all product waste disposed to landfill and incinerator, the majority is paper (13 per cent), plastic (13 per cent) and a diversity of other materials.



CURRENT ZERO PRODUCT WASTE INITIATIVES

- Local business partnership that collects, processes, and recycles textiles locally, with a goal to have no textiles disposed of to the landfill
- Sharing businesses like tool libraries
- Coffee bag take back program
- Take-out container exchange program

HOW CAN WE GET TO ZERO PRODUCT WASTE BY 2040?

Challenges

- Consumer drive for the latest goods, technologies and products that are designed with planned obsolescence
- Current regional economy does not include all aspects of a products life cycle which is important for a circular economy
- Lack of regional economy that includes all parts of a products life cycle
- Knowledge disconnect between designers, producers and waste managers
- Gaps in zero waste business investment and innovation
- Disconnect exists between the current infrastructure and technology to dispose of materials and the upstream development of products

Opportunities

- Foster a zero waste culture that includes rethinking waste and changing behaviour
- Support regional circular economy and local businesses that include all parts of a product's life cycle (Silicon Valley of Zero Waste)
- Close the loop by connecting designers with disposal
- Foster zero waste business investment and innovation through collaborative approaches and partnerships
- Address the "inconvenience" of zero waste by investing in infrastructure and technology to make zero waste accessible for all
- Create or update regulations and policies that incentivize zero waste, reuse and recycling businesses, services and programs
- Gather clear and comprehensive data on products and product waste to be shared as a multi-lingual resource with consumers and businesses

PRODUCT WASTE: PROPOSED OBJECTIVES AND PRIORITIES

1	TAKE A SYSTEMS WIDE APPROACH THAT ENABLES COLLABORATIVE GOVERNANCE MODELS AND WASTE REDUCTION
1.1	Set up accountable governance systems to support zero waste policy and regulations
1.2	Foster innovation through collaborative models of planning and communication
2	SUPPORT ZERO WASTE CULTURE & COMMUNITY TO DRIVE BEHAVIOR CHANGE
2.1	Set clear principles
2.2	Create zero waste and waste reduction strategy
2.3	Support zero waste product manufacturing systems
2.4	Develop integrated communications strategies across local, regional and provincial governments
2.5	Connect like-minded groups; promote and fund local zero waste initiatives
2.6	Incentivize and educate local businesses on zero waste culture to spark a shift in practices and products
2.7	Connect consumers with easily accessible information about the natural resources used to create products, and their ultimate environmental impact.
3	STRENGTHEN LOCAL CIRCULAR ECONOMY
3.1	Foster social innovation and pilot programs to enable the circular economy
3.2	Broaden the types of EPR programs to include all materials
3.3	Provide employment/ entrepreneurial opportunities for vulnerable and low income communities
3.4	Support product sharing and re-use (i.e. the "sharing economy")
3.5	Additional support and relaxation of rules for small scale manufacturing operations
3.6	Review, update and educate businesses on the reduction of packaging waste
3.7	Increase demand for local and reused materials and products
4	CONNECT DESIGNERS TO DISPOSAL TO CLOSE THE LOOP
4.1	Support the development of a closed loop system with local designers and manufacturers
4.2	Build an understanding and share information on the impact of material and product waste
4.3	Create financial incentives for closed loop products
4.4	Create closed loop diversion programs that are tailored to specific waste streams
4.5	Develop standards, labels, certifications and regulations for closed loop manufacturing of products and packaging



PRODUCT WASTE: PROPOSED OBJECTIVES AND PRIORITIES

5	FOSTER ZERO WASTE INNOVATION
5.1	Create zero waste hub and community that shares information, communicates with public and collaborates on innovative solutions
5.2	Foster innovation through programs and initiatives that incubate and scale up new solutions
5.3	Set zero waste policies for government and businesses to support/enable/incentivize zero waste practices
5.4	Build an understanding and share information on the impact of material and product waste
5.5	Foster recognition and celebration of innovation, innovators and zero waste leaders
6	INCREASE COLLECTION THROUGH ZERO WASTE INFRASTRUCTURE AND TECHNOLOGY
6.1	Identify infrastructure needs and areas to be developed
6.2	Create systems to transfer knowledge between producers and consumers
6.3	Collaborate on local and non-local non-profit zero waste initiatives
6.4	Review and improve building codes, design and bylaws
6.5	Create shared infrastructure that is public and private, centralized and decentralized
6.6	Invest in research and development for new zero waste products
6.7	Develop education programs for K-12 schools
7	ENABLING ZERO WASTE SUPPORTIVE POLICY AND REGULATION
7.1	Accountable governance where government and industry work together
7.2	Product manufacturer EPR - Strengthen regulations to enforce and produce intended outcomes
7.3	Support healthy family policies that encourage zero waste actions
7.4	Review policies and regulations which could require food packaging materials to be recyclable or compostable
7.5	Review and improve land use policies
7.6	Work across diverse populations to enable zero waste
7.7	Pre-plan: map systems in depth and work with other orders of government on new policies
8	PROVIDE CLEAR & ACCESSIBLE INFORMATION TO ENABLE ZERO WASTE DECISIONS
8.1	Use digital tools and innovations to track, trace and recycle products
8.2	Develop education strategies and programs for businesses and consumers on best practices, how-to's, etc.
8.3	Provide incentives for consumers to reduce and ultimately eliminate their product waste
8.4	Establish transparency on the life cycle of products and communicate how to get to or achieve zero waste
8.5	Review and update regulations on product packaging labeling, standards and health and safety



WHAT WE HEARD

FOOD WASTE

CURRENT STATE OF FOOD WASTE IN VANCOUVER

On many levels, Vancouver's food system is very robust. The City, in partnership with the Vancouver Food Policy Council and countless community organizations, has been working to create a just and sustainable food system for the past decade.

From a waste perspective, food scraps have been banned from disposal as garbage since 2015 and all properties in Vancouver are required under by-law to have an organics diversion plan in place. Participation in the City's Green Bin food scraps program and compliance with the disposal ban is generally high. Still, nearly 16% of all material disposed of at the landfill or incinerator is food waste, demonstrating that there is still a lot of room for improvement to reduce food waste in general and to ensure that when food is no longer edible, that it is properly disposed of.

CURRENT ZERO FOOD WASTE INITIATIVES

- K-12 educational courses on local and sustainable food, food waste reduction, and food recycling
- Business Improvement Area (BIA) efforts to engage restaurants in zero waste initiatives through the Metro Vancouver Zero Waste Challenge
- Urban farms and food distributors linking retailers and consumers with local and sustainable food suppliers
- Technological improvements to composting methods to reduce associated odour and increase general use in homes and for businesses
- Businesses using on-site composters
- Organics waste disposal ban, the City's Green Bin program and numerous private waste hauling businesses now offering food scraps collection for composting

HOW CAN WE GET TO ZERO FOOD WASTE BY 2040?

Challenges

- A grab-and-go and ready-made culture that increases the use of single service containers, plastic wrap, dishware, etc.
- Lack of knowledge on how to reduce food waste
- Global food markets result in a disconnect between consumers and the life cycle of foods



- Gaps in zero waste business investment and innovation
- Lack of adequate infrastructure and technology to support zero food waste initiatives
- Inconsistent and costly regulations and policies across governments
- Lack of clear and comprehensive information on our food systems and their contributions to food related waste

Opportunities

- Foster a zero waste culture that includes rethinking waste and changing behaviour
- Increase knowledge and capacity for zero waste amongst all generations and all sectors
- Connect communities with every aspect of the life cycle of food
- Foster business investment and innovation
- Invest in local infrastructure and technology to make zero wasted food the new norm
- Collaborate on new and updated regulations and policies, such as Packaging and Food Safety Regulations, that incentivize zero waste and consider social and economic costs to residents and businesses
- Develop clear and comprehensive data research, collection and sharing systems on food and food waste

FOOD WASTE: PROPOSED OBJECTIVES AND PRIORITIES

1	SHIFT CULTURE AROUND FOOD AND FOOD WASTE
1.1	Instill a sense of ownership in food systems through programs, services and businesses
1.2	Develop education strategies to create empathy and action amongst all generations
1.3	Develop marketing and communications strategies for zero waste values and lifestyles
1.4	Take a collaborative approach to shifting culture
2	CONNECT THE COMMUNITY WITH EVERY ASPECT OF FOOD
2.1	Support community composting initiatives
2.2	Expand education for children and youth
2.3	Develop food nutrition literacy programs
2.4	Review and expand food assets and recovery infrastructure to improve access to food
2.5	Connect people to food systems through the economy, jobs and community food assets
3	CREATE EDUCATION SYSTEMS THAT VALUE FOOD
3.1	Collaborate with academia and businesses to foster innovation and action
3.2	Review and expand sharing economy businesses, programs and services
3.3	Support behaviour change initiatives through education programs in schools
3.4	Develop awareness and behaviour change campaigns
3.5	Celebrate and encourage champions
4	STRENGTHEN LOCAL CIRCULAR FOOD ECONOMY AND INFRASTRUCTURE
4.1	Review and improve food redistribution systems and infrastructure
4.2	Support local food economy throughout its life cycle in the region
4.3	Experiment with decentralized community food assets and zero waste infrastructure
4.4	Research the life cycle of food and waste streams
4.5	Create regulations that support zero waste standards for food and food packaging
5	DRIVE BUSINESS INNOVATION
5.1	Create a zero waste certification program for food related businesses
5.2	Identify and support opportunities for collaboration and business incubation
5.3	Research best practices and share across the business community
5.4	Develop a multi-sector Advisory Committee to inform zero waste strategies and solutions
6	REVIEW AND IMPROVE REGULATIONS AND POLICIES
6.1	Update health and safety policies related to food and food packaging to support zero waste initiatives
6.2	Review and update building and land use policies to support local food systems and zero waste initiatives
6.3	Research regulations from other North American cities to create recommendations for improvement
6.4	Research and develop incentive based systems that support zero waste policies
6.5	Explore options to support zero waste policies through new enforcements systems
7	REVIEW AND UPDATE PACKAGING AND FOOD SAFETY REGULATIONS
7.1	Review expiry date regulations and provide recommendations
7.2	Develop packaging policies that focus on waste reduction, promote reuse and protect health and safety
7.3	Collaborate with regulatory bodies to create policies, guidelines and best practices that balance food safety with the reduction of food waste
7.4	Introduce region-wide innovative policies that support the reduction of packaging waste
7.5	Create a plan to reduce packaging and single use item waste
8	IMPROVE DATA AND INFORMATION SYSTEMS
8.1	Gather and share data on the status of food waste at every stage of life cycle
8.2	Partner with the community and academics on research
8.3	Make information and research accessible to businesses and public through publications, certification systems, labels etc.
8.4	Collect data from businesses on the amount of waste generated

WHAT WE HEARD

BUILDING AND ASSET WASTE

CURRENT STATE OF BUILDING AND ASSET WASTE IN VANCOUVER

As new buildings and infrastructure are constructed and the old are demolished, maintained or renovated, resources are left unutilized afterwards. Many of these resources are reused or recycled on other projects, but a portion is disposed to landfill and incinerator. There are many different types of wasted resources generated from these activities, including concrete, bricks, gypsum, wood, glass, metals, plastic, asbestos and excavated soil.

Demolition, land-clearing and construction (DLC) waste accounts for approximately 32 per cent of all waste disposed to landfill and incinerator and 58 per cent of all waste recycled in Vancouver. In 2015, Metro Vancouver and member municipalities, including the City of Vancouver, introduced the new Clean Wood Disposal Ban. The City also introduced a Green Demolition Permit Program with minimum reuse and recycling requirements for demolition waste on houses built before 1940 and opt-in requirements on houses built in or after 1940.

CURRENT ZERO BUILDING AND ASSET WASTE INITIATIVES

- Reclamation of wood in building demolition
- Promoting sustainability through the use of reclaimed materials in new building design and construction
- Use of European technology for life cycle assessments of building performance and waste implications, and technology for the separation and recovery of construction and demolition waste is well established
- Regional government targeting 100% diversion of clean wood waste with Clean Wood Waste Ban
- City of Vancouver Green Demolition Program

HOW CAN WE GET TO ZERO BUILDING AND ASSET WASTE BY 2040?

Challenges

- Lack of consumer knowledge and trade capacity to support zero waste buildings
- Lack of robust regional markets for the reuse and recycling of materials from demolished buildings



- Expensive land, resources and processes to build buildings and assets
- Lack of land and resources available to collect, store, reuse, remanufacture and resell building materials
- Lack of information on building waste and how to reduce /eliminate building waste in design, operations and deconstruction

Opportunities

- Establish collaborative governance models and capacity building programs through oversight bodies, industry stewardship groups, researchers and educational institutions
- Shift culture by valuing reusable, recyclable materials and creating consumer demand for sustainable construction and deconstruction
- Build capacity in key players, such as architects, designers, developers and real estate agents, to support, design and construct zero waste buildings
- Support zero waste building through policies, funding, programs and services
- Establish standards that support building disassembly and the reuse or recycling of building materials
- Develop research and information systems that can be used to communicate how to create zero waste buildings for all trades

BUILDING AND ASSET WASTE: PROPOSED OBJECTIVE AND PRIORITIES

1	TAKE SYSTEMS-WIDE COLLABORATIVE APPROACH TO BUILD CAPACITY FOR ZERO WASTE IN PRIVATE SECTOR
1.1	Create standardized policy across all levels of government that enable zero waste initiatives
1.2	Build partnerships, infrastructure and capacity for industry to work together to close the loop
1.3	Support the adoption of alternative material sourcing to connect construction to deconstruction
1.4	Create industry-wide collaborative that shares best practices, standardizes practices, and implements new C&D processes
1.5	Work to introduce the zero waste cultural shift with the labour force
2	FOSTER ZERO WASTE CULTURE AND COMMUNITY SO THAT THERE IS A DEMAND FOR ZERO WASTE
2.1	Support initiatives that value reduction and reuse over recycling and disposal
2.2	Support zero waste corporate leadership and policies
2.3	Educate the public and trades on zero waste building culture and initiatives
2.4	Develop policy that requires zero waste designs and C&D practices
2.5	Create clear zero waste targets, indicators and measurement tools and implement with certification systems, incentives and labeling
3	FOSTER STRONG CIRCULAR ECONOMY THAT VALUES MATERIALS AS A RESOURCE
3.1	Update business and public procurement policies
3.2	Review building code and use forward thinking certification systems like the Living Building Challenge
3.3	Provide incentives for architects, designers, and manufacturers to maximize the lifespan of built assets while valuing the re-usability of materials at the end of a buildings life
3.4	Create zero waste construction policies that encourage more sourcing of reused/recycled materials
3.5	Create collaborative for development and deconstruction research
3.6	Review and update local, provincial and federal policies on EPR, hazardous materials and deconstruction
3.7	Develop zero waste education strategies and programs for trades
3.8	Fund Cradle to Cradle research, training and development
3.9	Provide space and facilities for local manufacturing and deconstruction
4	ZERO WASTE INNOVATION SUPPORTS BUILDINGS THAT CAN BE FULLY DISASSEMBLED AND PARTS REUSED
4.1	Develop standards and certification systems for mechanical connections and other building parts in construction to enable modular systems, safe adhesives and easier deconstruction
4.2	Create standards for building components to be reused and recycled such as solar panels
4.3	Research and develop clear design disassembly policy that can be integrated into the building code and rezoning policies
4.4	Support disassembly through market levers like take back programs, EPR, and circular business models
4.5	Research and educate trades on "construction to assemble"
4.6	Enable the preservation of existing quality housing stock to reduce waste from redevelopment
4.7	Explore incentives and disincentives to support buildings that can be easily disassembled such as FSR exclusions, fees, bans, etc.
5	ZERO WASTE TECHNOLOGY AND INNOVATION USED FOR BUILDING DECONSTRUCTION
5.1	Review and improve permitting process to incentivize/disincentive deconstruction
5.2	Work with industry to expand land access, facilities and infrastructure for deconstruction
5.3	Integrate zero waste considerations into planning policies and bylaws
5.4	Support research on deconstruction, training and monitoring of waste reduction
5.5	Support market mechanisms that increase deconstruction including labeling of building materials, rating systems for materials based on recyclability/deconstructability, public procurement policies and incentives
6	BUILDING OPERATIONS SUPPORT ZERO WASTE
6.1	Review and update building planning and design requirements for new buildings
6.2	Engage industry and the public on the amount of waste created throughout a buildings life cycle
6.3	Create clear targets and evaluation and monitoring systems to track waste along the life cycle of a building
6.4	Provide incentives to go zero waste
6.5	Review and update purchasing policies

WHAT WE HEARD

WASTE MANAGEMENT

CURRENT STATE OF WASTE MANAGEMENT IN VANCOUVER

Vancouver is part of a regional waste system managed by Metro Vancouver, under Provincial regulation that combines private and public haulage and disposal. Residential waste collection and disposal in Vancouver is managed in part by the City through its own collections and the City's Vancouver Landfill in Delta, with private haulers playing an important role in the collection, processing and disposal of materials primarily from the multi-family, commercial and institutional sectors. In 2015, Vancouver's residents, businesses, organizations and government disposed of approximately 370,000 tonnes of material to landfill and incinerator.

CURRENT ZERO WASTE INITIATIVES

- National Zero Waste Council
- Regional and Provincial collaborated Extended Producer Responsibility programs
- Master Recycling Program educates Vancouverites to become master recyclers who then educate their community on how they can increase recycling rates
- The Binners' Project supports socially inclusive waste diversion programs
- Mobile Application to educate and help navigate the complexity of the waste management system (e.g. Waste Wizard)
- Advances in mechanical sorting technologies at landfill and recycling facilities to reduce contamination

HOW CAN WE GET TO ZERO WASTE IN VANCOUVER'S WASTE MANAGEMENT SYSTEMS BY 2040?

Challenges

- A culture that sees garbage as an inevitable part of our lives and does not view garbage as wasted resources
- Wasteful 'take, make, dispose' economic model that reaches beyond Vancouver and spans the globe
- Industries and technologies that support greater material diversion and reuse are still maturing



- Lack of neighbourhood based facilities and depots to make reuse, repair, sharing and recycling materials convenient, affordable and accessible
- Disconnect between material design and disposal technology, with no national standardization in the industry
- The costs associated with current waste prevention, reduction and recycling processes

Opportunities

- Foster social and cultural shift towards zero waste through education, capacity building around reuse, repairing and remanufacturing
- Support regional circular economy business models, practices and services that illustrate economic feasibility of waste to resources and material recovery
- Invest in innovations that grow local green and zero waste industries and drive job creation locally while demonstrating leadership internationally
- Establish neighbourhood centres, depots or hubs that make reuse, repair, sharing and recycling materials convenient, affordable and accessible
- Support new reuse and recycling infrastructure and technology through financial incentives for local businesses
- Review and update policies and incentives / disincentives that maximize and expand Extended Producer Responsibility Programs and integrate zero waste into material designs

WASTE MANAGEMENT: PROPOSED OBJECTIVES AND PRIORITIES

1 FOSTER ZERO WASTE CULTURE & COMMUNITY THROUGH EDUCATION AND POLICY	
1.1	Support public education strategies that use innovative tools and techniques (i.e. digital innovations, pilot programs, school competitions, landfill visits)
1.2	Support industry education strategies that increase waste diversion and circular practices, such as workshops, incentives, waste audits, tracking systems to monitor and evaluate industry progress
1.3	Collaborate with private industry to research and implement best practices in waste elimination
1.4	Research and update policies that make individuals and industry accountable for waste including bans, fees and incentives
1.5	Explore grassroots community action to educate consumers on the importance of treating waste as a resource and shift consumption behaviours
1.6	Engage diverse communities to better understand how to align values with zero waste culture
1.7	Create K-12 education programs on cause and effect of what we waste
1.8	Develop public "Carrot education" with clear labeling and rating systems on recyclability of products and packaging
1.9	Develop clear communications strategy to educate public in different languages about how to properly sort and dispose of waste
2 SUPPORT A SHIFT IN CULTURAL MINDSET TO CREATE CAPACITY AND DEMAND FOR ZERO WASTE	
2.1	Support initiatives that value reduction and reuse over recycling and disposal in messaging
2.2	Support leadership of organizations using and providing zero waste services and products
2.3	Research and update policies to require recycling of all materials
2.4	Create clear steps to effect change: set targets, create measurement tools, implement change through standards, labels, certification systems and other visual aids
3 THROUGH INNOVATION, FOSTER A ZERO WASTE INDUSTRY THAT DRIVES JOB CREATION AND CAN BE SHARED GLOBALLY	
3.1	Create a local/global zero waste certification system that would acknowledge and challenge companies, cities and regions to achieve zero waste
3.2	Support research that helps to identify the current situation of waste, barriers to waste reduction and opportunities for increased diversion
3.3	Review and update regulations and policies to foster innovation through incentives, local land use planning, and business licensing
3.4	Provide financial levers to enable innovation in the circular economy through grants, awards, competitions, investments etc.
3.5	Collaborate with industry to develop certification, labeling systems and awards for zero waste and circular economy initiatives
3.6	Partner with education institutions to provide curriculum and programs on the circular economy
3.7	Create forums for collaboration between academia, industry and government
3.8	Set up innovation incubation programs such as mentorship programs for start-ups, allocating space at the landfill for a research and material recovery facility, and innovation hubs
3.9	Through the circular economy consider opportunities to address issues of social inequity, affordability, accessibility and convenience



WASTE MANAGEMENT: PROPOSED OBJECTIVES AND PRIORITIES

4 SUPPORT DEVELOPMENT OF LOCAL ZERO WASTE INFRASTRUCTURE AND TECHNOLOGY	
4.1	Update or create policies that support community based zero waste infrastructure, such as re-use and recycling days pick-up services for special items, building codes that enable these facilities, etc.
4.2	Support zero waste activities through incentives or disincentives, such as charging for garbage collection by weight and tax breaks for zero waste infrastructure
4.3	Invest in zero waste companies, research, infrastructure and transportation networks
4.4	Use digital technologies, labeling and certification systems, competitions and city-to-city partnerships to educate the public and businesses on zero waste
4.5	Review current waste management physical infrastructure in region and improve through different strategies such as innovation hubs, upgraded reuse and recycling infrastructure in community and at landfill and distribution networks to get recyclables back into market
4.6	Research and develop technology that vertically integrates recycling processes, standardizes plastics for recycling and expands ways to convert waste to new materials
4.7	Create a collaborative task force that will review the challenges with our current waste system and enable technology that addresses those challenges
5 ALIGN POLICIES AND INCENTIVES TO INITIATIVES THAT ELIMINATE BARRIERS TO ACHIEVING ZERO WASTE	
5.1	Develop policies that promote and regulate source separation, reduce public confusion and keeps waste in the region for reuse/recycling
5.2	Evaluate and update EPR programs
5.4	Foster zero waste innovation and practices through cost structures, rebate programs, grants, etc.
5.5	Create financial incentives and disincentives to promote zero waste business including tax breaks, fees for non-compliance, and investment in research and development on products that can be reused / recycled
5.6	Develop clear communications strategy to educate public in different languages about how to properly sort and dispose of waste
5.7	Establish clear measurement tools to audit and track waste reduction at city, business and resident level and enforce violations
5.8	Review and update policies on zero waste infrastructure, facilities, technology and transportation systems, as well as measurement, tracking and benchmarking tools
5.9	Provide incentives for industry that are responsive to zero waste strategy targets, such as investing in new projects, tax breaks, rewards for innovators, access to infrastructure to collect/recycle materials



WORKSHOP PARTICIPANTS

Here is a list of organizations who had a representative present at one or more of the four workshops. There were also other members of the general public in attendance.

1-800-GOT-JUNK?	Food Lens Consulting	Project4 Living Systems
Action Environmental Services Inc	FPIInnovations	Quupe
Adaptation to Climate Change Team (SFU)	Fraser Health Authority	Ramsay Worden Architects
ARA Mental Health	Fraser Valley Regional District	Recycling Council of BC
Aramark Canada Ltd.	Free Geek Vancouver	Recollective Consulting
Aslin Canada Trading	Gente Strategies Inc.	RecSquared
Atira	Greater Vancouver Food Bank	Recycling Alternative
BC Bottle and Recycling Depot Association	Green	Recycling Council of BC
BC Housing	Green Bricks Education Society	Repurpose
BCIT	Green century enterprises.	Revolution Health
Be The Change Earth Alliance	Green Demo Inc.	Revolution Resource Recovery
Bidders Project	Growing City	Salvation Army
Bioland Environmental Solutions	Habitat For Humanity Greater Vancouver	Self-employed
Biomass supply chain consulting co.	Harvest Power	Simon Fraser University
Bokoeco	Hastings Community Association	Sodexo Canada
BOMA BC	Homestead Junction	South Hill Business Association
BSI Biodegradable Solutions	IKEA	South Vancouver Neighbourhood House
Buy-Low Foods / Associated Grocers	Institute for Sustainable Food Systems / Vancouver Food Policy Council	SPEC
Canadian Diabetes Association	Kendor Textiles	Sustainable Food, Attainable Health
Cascades Recovery Inc.	Keystorm Solutions	Tetra Tech Canada
CESA	Kwanten Polytechnic University	The Bidders' Project
Chambar Restaurant	Lafarge Homes	The District of Squamish
ChopSwap	LaneFab	The Launch Box
City of Vancouver Board of Parks and Recreation	Light Touch Energy Healing	Tourism Vancouver
Clean It Recycling Solutions Inc.	Litchfield	Trans-Continental Textile Recycling Ltd.
Climate Smart	Marcon Construction Ltd.	Translink
Cloverdale Fuel	Mattress RecyclingTM	UBC Botanical Garden
Club Monaco	MEC	UBC/ SPEC
Concert Properties	Merlin Plastics	University of Alberta
Cork It Manufacturing Inc.	Mesh Food Exchange	University of British Columbia
Creative Energy	Metro Vancouver	University of British Columbia & Qu Biologics
Dillon Consulting Limited	Mosaic Homes	Upcycle Obsessions
Discovery organics	Mount Pleasant Neighbourhood House	Uproot
DTES Kitchen Tables, Potluck Cafe Society	Multi-Material BC (MMBC)	Urban Development Institute
Earnest Ice Cream	Naturally Crafted	Urban Impact Recycling Ltd
Eclipse Awards	Nature's Path Foods	Vancouver Aquarium Marine Science Centre
EcoSafe	Net Zero Waste	Vancouver Board of Parks and Recreation
Ecowaste Industries Ltd.	New West Gypsum	Vancouver Coastal Health
Edible Canada	Nexterra Systems Corp.	Vancouver School Board
Elements Society	Northwest Hydraulic Consultants	VIVE Collective
Emily Carr University	Ocean Wise/Vancouver Aquarium	Walas Concepts
Encorp Pacific Canada	Octiscapes	Waste Management Association of BC
Enviro Smart Organics Ltd.	Overwaitea Food Group	Wild Mama
Fairware	Pac Recycling	Wilson School of Design
Fernwood Neighbourhood Resource Group	Potluck Cafe Society	Women's and Children's Hospital
FiFo Dot Enterprises	Product Care	XeroWaste Solutions Inc.
Food Connections / Feeding the 5000	Progressive Waste Solutions	YVR
		Zero Waste Market