Supports Item No. 3
P&E Committee Agenda
July 8, 2010

CITY OF VANCOUVER

ADMINISTRATIVE REPORT

Report Date: June 29, 2010
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Meeting Date: July 8, 2010

TO: Standing Committee on Planning and Environment

FROM: General Manager of Engineering Services

SUBJECT: Regional Integrated Solid Waste and Resource Management Plan & Progress Update on GCAT Zero Waste Recommendations

RECOMMENDATION

A. THAT Council forward comments on the April 28, 2010 draft regional Integrated Solid Waste and Resource Management Plan (ISWRMP) to Metro Vancouver summarized generally as follows, and specifically as listed in Appendix 1 and further described in this report:

- It is considered premature to seek Provincial approval on the ISWRMP prior to completing comprehensive analysis of social, environmental and economic impacts and confirmation of net-benefits of proposed ISWRMP strategies and actions;
- Additional actions with respect to waste reduction and diversion are recommended, including strengthened goals and performance measures, increased utilization of Extended Producer Responsibility (EPR) policy and regulatory options, and expansion of regional material recovery capacity;
- The long-term viability of funding waste diversion initiatives with surplus tipping fee revenue derived from reducing quantities of waste requiring disposal needs to be monitored closely; contingency options should be developed fully;
- Further assessment of mass burn incineration with energy recovery is required, including an independent review of current findings and recommendations; pursuit of WTE should be subject to an open market request for proposals for all site-specific options;
- It is considered critically important that waste disposal bridging and contingency strategies be fully developed relative to timelines proposed within the plan;
- Actions which propose regulatory oversight of the Vancouver Landfill by Metro Vancouver should be removed from the ISWRMP given these are Provincial responsibilities.

B. THAT Council reaffirm that as a condition of its participation in a Regional Solid Waste Management Plan, Vancouver maintains autonomy in the disposal of its solid waste by providing and operating its own facilities, including the Vancouver Landfill and Vancouver South Transfer Station.

C. THAT Council invite the Corporation of Delta and Metro Vancouver to discuss a goal of setting maximum annual disposal tonnage targets at the Vancouver Landfill which reduce over time and which are less than the Landfill's permitted annual disposal capacity of 750,000 tonnes.

D. THAT Council direct staff to develop strategies and report back with recommendations for banning the disposal of food scraps and clean wood waste at the Vancouver South Transfer Station and the Vancouver Landfill.

E. THAT Council direct staff to review options and report back with recommendations for increasing penalties for non-compliance with material disposal bans.

F. THAT Council receive for information the enclosed draft *Solid Waste Stewardship 2020* visioning document dated June 15, 2010.

COUNCIL POLICY

In the establishment of the 1989 Tripartite Agreement between the City of Vancouver, the Corporation of Delta and the Greater Vancouver Sewerage & Drainage District, Council resolved that as a condition to its participation in the regional Solid Waste Management Plan, Vancouver maintain autonomy in the disposal of its solid waste by providing and operating its own facilities, including the Vancouver Landfill.

On March 27, 1990, Council approved not proceeding with a Downtown Resource Recovery Plant at the present time, and directed staff to develop various waste reduction, reuse and recycling initiatives focussed on recyclables separated from garbage at their source of generation.

On May 3, 1994, Council agreed to provide qualified support to the Greater Vancouver Regional Solid Waste Management Plan. That plan was later approved by the Province pursuant to the British Columbia Waste Management Act.

On April 5, 2007, Council recommended to Metro Vancouver that in the implementation of the regional Zero Waste Challenge and development of an amended solid waste management plan, it adopt an initial target of 75 percent diversion of waste through the elimination of wood, paper, cardboard, and yard waste from the residual waste stream.

Also on April 5, 2007, Council recommended the Provincial Government be urged to adopt full product stewardship standards.

On May 5, 2009, Council received the Greenest City Action Team's *Quick Start Recommendations* report, and on October 2009 the *Vancouver 2020 A Bright Green*

Future report, and tasked staff with developing an implementation strategy. Both of these reports include recommended Zero Waste targets and actions.

PURPOSE

The purpose of this report is to provide Council with information and comments on Metro Vancouver's April 28, 2010 draft regional Integrated Solid Waste and Resource Management Plan (ISWRMP), which Metro Vancouver is inviting comments on by July 14, 2010.

This report also provides a progress update and initial recommendations regarding waste diversion subsequent to Council receiving the GCAT's Bright Green Future report and directing staff to proceed with the development of implementation plans.

SUMMARY

Metro Vancouver Draft Integrated Solid Waste and Resource Management Plan

This report provides staff's comments and recommendations on Metro Vancouver's draft Integrated Solid Waste and Resource Management Plan (ISWRMP) dated April 28, 2010 (Attachment 1), in response to MV's request for comments no later than July 14, 2010. General concerns with respect to MV seeking Provincial approval of the ISWRMP prior to comprehensive analysis of social, environmental and economic impacts and confirmation of net-benefits of proposed strategies and actions are noted. Specific comments and recommendations are summarized as follows:

- It is recommended that the ISWRMP indicate that waste reduction and diversion efforts will continue if the goal of 70% is reached early;
- Additional performance measures are recommended, including tracking waste by sector and by Extended Producer Responsibility (EPR) material category;
- Additional work with respect to EPR is recommended, including advocating that the Province accelerate the expansion of EPR programs to include packaging materials, assessing the effectiveness of EPR as the primary waste reduction strategy in the plan, determining the sensitivity of MV's current waste generation forecasts based on expected EPR program expansions, and including product stewardship industries in a MV Eco-Centre business plan;
- The ISWRMP should be strengthen to drive increased recycling market demand by including commitments to expand materials disposal bans and penalties by 2015;
- Increased demolition, landclearing and construction (DLC) waste diversion may be possible through revisions to GVS&DD By-laws 181 and 183 and by MV working with the Province to limit the export of DLC waste out of the region;
- Clean wood waste should be diverted from landfill and incineration to recycling and composting, and the environmental impact of using treated wood waste in the various WTE technologies considered in the draft plan should be assessed;
- The long-term viability of funding waste diversion initiatives with surplus tipping fee revenue derived from reducing quantities of waste requiring disposal needs to be monitored closely; contingency options should be developed fully;
- Opportunities for expanding material recovery capacity in the region need to be pursued for the purpose of maximizing the diversion of recyclable materials still

remaining in the garbage after recycling strategies and actions focussed at the point of waste generation are maximized;

- Further assessment of mass burn incineration with energy recovery is required, including an independent review of MV's current findings and recommendations; pursuit of WTE should be subject to an open market request for proposals for all site specific options;
- It is recommended that waste disposal bridging and contingency strategies be developed, for dealing with residuals after the closure of the Cache Creek Annex and relative to timelines proposed within the plan;
- Actions which propose regulatory oversight of the Vancouver Landfill by Metro Vancouver should be removed from the ISWRMP given these are Provincial responsibilities.

The overall financial impact of the draft plan across the region is anticipated to be significant and includes capital and operating costs for new facilities, and potentially an increase in the Waste Reduction and Recycling Rate to fund regional waste diversion promotions and programs. Once the plan is finalized and full details are available, staff will report to Council with a complete description of financial impacts specific to Vancouver.

With these comments, staff support Metro Vancouver's efforts to finalize a new regional solid waste management plan.

Progress Update on Development of a City of Vancouver Zero Waste Strategy

This report also provides Council with an update on work completed subsequent to Council receiving the GCAT's recommendations and presents a draft visioning document titled *Solid Waste Stewardship 2020* (Attachment 5) for information. Public comment on this draft document will be sought during upcoming public consultation. The results of that process will help inform the development of a detailed Zero Waste implementation plan, which will be reported back to Council. To take advantage of increased near-term waste diversion opportunities, this report also recommends staff develop strategies for banning food scraps and clean wood from Vancouver Landfill disposal, increasing disposal ban penalties, and reducing the annual maximum amount of material disposed at the Landfill.

BACKGROUND

Since 2009, Metro Vancouver (MV) has proceeded with the development of a new regional solid waste management plan (SWMP) and subsequently released the draft Integrated Solid Waste and Resource Management Plan (ISWRMP) for consultation. Once approved by the Ministry of Environment the ISWRMP will commit Vancouver to participating in a regional strategy to increase waste diversion to 70 percent by 2015.

Reports to Council on Development of a SWMP

This report is the sixth report to Council on the development of a new SWMP to replace the current SWMP approved in 1995. Previous reports are summarized briefly as follows:

i) On January 29, 2008 Council considered a staff report outlining risks to the City from a MV proposal to use the Vancouver Landfill as a long-term residual disposal

facility for the entire Region, and as an interim solution for regional waste disposal needs from the time the Cache Creek Landfill is full until such time as long-term waste to energy (WTE) alternatives are implemented. Council resolved to inform the Commissioner of MV that the City will not accept regional waste quantities in excess of the SWMP or the Vancouver Landfill Operational Certificate (allows a maximum of 750,000 tonnes per annum), unless those are first amended, and that the City will not apply for an Operational Certificate amendment until Council has had the opportunity to assess the implications to Vancouver.

ii) In a report presented to the Standing Committee on City Services and Budgets on April 17, 2008 Council was advised of staff's concerns with MV's then planned abbreviated process for amending the 1995 SWMP, and their proposal to utilize mass burn waste incineration as the sole means of waste disposal for the Region and close the Vancouver Landfill by 2020 to all but incinerator ash. Council resolved to advise MV and the BC Minister of Environment that the City does not support MV's SWMP amendment process or content. (MV subsequently revised both the process and content of the plan. The new process has provided a greater opportunity for public input and the content of the current draft plan is the subject of this report.)

iii) On March 26, 2009 Council received a report from staff on the findings of consulting studies to determine the value of the Vancouver Landfill to taxpayers, to assess the financial implications for Vancouver and its ratepayers of changing the role of the Landfill within the regional solid waste system, and to estimate and compare greenhouse gas (GHG) emissions from the Landfill to MV's proposed expanded use of waste incineration. Key findings from that work (the Deloitte report) were:

- The Vancouver Landfill is a significant financial asset to Vancouver and its residents with a net present value to Vancouver taxpayers of $700 million based on a comparison of the cost of continuing to landfill versus joining the regional system and paying the regional rate.
- Vancouver's best course of action from a financial perspective is to extend the life of the Landfill by reducing and diverting waste.

iv) On May 17, 2010 Council was provided a memo report with information on MV's current public consultation process on the draft ISWRMP. Staff indicated general support of the waste diversion actions and strategies proposed under the draft plan, and noted there to be good alignment with the GCAT's Zero Waste recommendations. Conversely, staff noted risk and uncertainty with what is proposed with respect to energy recovery from waste via mass burn incineration.

v) For the purpose of providing Council with a broader perspective on alternatives to mass burn waste incineration, on May 19, 2010 staff provided Council with a memo report with information on various waste conversion technologies (i.e. non-combustion thermal, biological and chemical WTE processes).

In order to provide context within which the draft ISWRMP and staff's comments have been developed, the following summary of historical and other key information is provided.

Historical Summary

The history of solid waste management within Vancouver and the rest of the region influence current operations and planning. Highlights of that history are summarized as follows:

- In the early 1970's the Greater Vancouver Sewerage and Drainage District (GVS&DD) Administration Board considered an Engineering Board of Review report that concluded that waste in the region could be handled at a lower cost on an inter-municipal basis rather than continuing the practice of each municipality managing their waste independently. Shortly thereafter, the GVS&DD Act was amended by the Province establishing the GVS&DD as the regional agency for solid waste management, and the first regional landfill was established in Coquitlam to serve eastern municipalities (later closed in 1983).
- Due to changing public attitudes to solid waste management, in 1979 the GVS&DD Board commissioned a review of alternatives to landfilling and in 1981 adopted a revised solid waste planning policy known as the *Five-Part Plan*. That plan, among other things, provided for increased recycling, led to the development of the current Tripartite Agreement between Vancouver, Delta and the GVS&DD for the disposal of regional waste at the Vancouver Landfill, and fostered the eventual development of the current WTE mass burn incinerator in Burnaby.
- After a failed effort in the early 1980's to develop an overall solution to solid waste disposal for the entire lower mainland (the *Lower Mainland Refuse Project*), in April 1985 the GVS&DD Board struck the Solid Waste Committee to develop a plan specific to the Region. The subsequent regional SWMP was approved by the Ministry of Environment in 1985 and incorporated both the Vancouver Landfill and the then Port Mann Landfill in Surrey as long and short-term disposal facilities, respectively. This 1985 SWMP also resulted in the establishment of the Cache Creek Landfill to provide longer-term eastern regional waste disposal capacity.
- Increased emphasis on waste reduction and recycling was the focus of the *Recycling Action Pan* approved by the GVS&DD Board in September 1989, which established the goal of an additional 20 percent reduction in waste by 1995 to reach a target of 30 percent total diversion.
- Also in 1989 the then Provincial Waste Management Act was amended to make Regional Districts responsible for solid waste planning and management. Subsequently the Province set a goal of 50 percent reduction by 2000, which led to the development of the current regional SWMP approved by the BC Minister of Environment in November 1995 (the 1995 SWMP). The 50 percent goal was reached early, in 1998, and has consistently remained at or above 50 percent since about 2006. MV reports that the current regional diversion rate is approximately 55 percent.
- Between 1992 until present, MV made considerable efforts to replace the Cache Creek Landfill which was scheduled to close in 2010. In 2009 the Province approved the Cache Creek Annex, which extends the life of the facility to 2012. A full timeline and description of this work was recently provided by MV staff to the GVS&DD Board and is included as Attachment 2.

Governance

SWMPs are a requirement under the BC Environmental Management Act (Act). An approved SWMP is legally binding on municipalities and Regional Districts who are required under the Act to meet the commitments of the plan.

Metro Vancouver and the City's solid waste systems and facilities operate under the current 1995 SWMP. MV member municipalities are party to the SWMP and the plan identifies the Vancouver Landfill as a long-term disposal facility. The Landfill's Operational Certificate is issued by the Province in accordance with the approved SWMP.

Through a network of six transfer stations, the Cache Creek Landfill and the Burnaby WTE facility, MV provides the majority of regional transfer and disposal capacity, and leads the development and implementation of waste diversion initiatives covering all sectors. Long-term solid waste management and diversion planning using a regionally centralized management model is considered rational and cost effective - it avoids a duplication of effort by individual municipalities and ensures reasonable consistency with program design and implementation across the region with an objective of maximized shared benefits.

The centralized waste reduction and recycling function that MV is responsible for is funded by the Regional Waste Reduction and Recycling Rate. The Rate is currently $2.20 per tonne and is levied on all municipal solid waste disposed in the regional solid waste system, including that which is disposed through the Vancouver South Transfer Station and the Vancouver Landfill. The current annual revenue generated from this Rate is approximately $3.3 million, of which Vancouver's share is approximately $740,000 (i.e. based on municipal solid waste originating from Vancouver).

The Ministry of Environment also plays a critical role in the stewardship of waste materials through Extended Producer Responsibility (EPR) under the Provincial Recycling Regulation. EPR is a policy approach whereby producers and consumers of products are held responsible for the end-of-life impacts of those items, instead of local government and the general taxpayer. The continued regulation and operation of existing EPR programs, along with the implementation of new and expanded EPR initiatives is integral to the success of local government's achieving aggressive diversion targets. It is considered rational and cost effective for senior government to lead EPR policy and programs given their overarching regulatory authority and since the flow of commodities covered by EPR programs do not recognize local government borders.

Vancouver Landfill Agreements

Vancouver has historically entered into operating agreements with the Corporation of Delta, the host municipality for the Vancouver Landfill, providing them with royalties and other benefits. Staff estimate that in 2009 Delta received total benefits equivalent to approximately $4 million, consisting of payments from the City and the value of avoided disposal costs. The current Vancouver–Delta agreement came into effect on November 2, 1996 and expires December 31, 2037, or earlier upon certain conditions.

The 1989 Tripartite Agreement between Vancouver, Delta and the GVS&DD establishes, among other things, various operational and financial covenants including how regional solid waste requiring disposal is allocated. An important feature of this agreement is that it acknowledges Vancouver maintains autonomy in the disposal of its solid waste and operation of its disposal facilities, as a condition of Vancouver's participation in the regional Solid Waste Management Plan. Terms governing the expiry of the Tripartite Agreement are similar to those in the Vancouver-Delta agreement.

Draft New Solid Waste Management Plan

Beginning in January 2008, MV proposed amendments to the 1995 SWMP to achieve aggressive new waste diversion targets and secure new disposal capacity. Work that ensued resulted in the April 28, 2010 draft ISWRMP, which is to replace the current 1995 SWMP. A copy of the draft ISWRMP is included as Attachment 1. It is this document which MV is seeking comments on by July 14th.

The draft ISWRMP consists of four goals that are consistent with the internationally recognized waste management hierarchy: 1) minimize waste generation; 2) maximize reuse, recycling and material recovery; 3) recover energy from the waste stream after material recycling; and 4) dispose all remaining waste in landfill, after recycling and energy recovery.

The plan is organized with strategies and actions under each goal. The waste diversion target identified by Goals 1 and 2 is 70 percent by 2015, which represents the diversion of an additional 600,000 tonnes of material annually from incineration and landfills (Table 1). This target is consistent with the GVS&DD Board previously approved target for the regional Zero Waste Challenge launched in September 2006.

Table 1: Summary of Metro's Planned Diversion Strategy to Reach 70%

Material	Currently Disposed (tonnes)	Planned Diversion Program(s)	Planned Diversion (tonnes)
Organic Waste (food waste, paper & paperboard, yard waste)	725,000	Composting, biofuel, disposal bans	395,000
Wood Waste	240,000	Modify permit process, wood drop-off at transfer stations & Eco-Centres	155,000
Plastic Waste	190,000	Expansion of plastics recycling	30,000
E-Waste & Small Appliances	27,500	Extended producer responsibility	20,000
TOTAL	**1,182,500**		**600,000**

Source: Metro Vancouver

MV reports that even with aggressive new waste diversion initiatives, with population growth over the next five years over a million tonnes of garbage will require disposal in 2015. To determine a preferred option for managing this remaining waste after waste reduction and recycling, MV retained consultants to study three basic options: 1) landfill; 2) mass burn incineration with energy recovery; and 3) waste treatment prior to landfilling or incineration, referred to as mechanical biological treatment (MBT). The findings of that work (the AECOM study) point to mass burn incineration with energy recovery for use in district heating as the recommended approach for managing residuals. Accordingly, MV has proposed that 500,000 tonnes per year of WTE capacity be developed within the region by 2015.

DISCUSSION

Metro Vancouver Draft Integrated Solid Waste and Resource Management Plan

Public consultation on Metro Vancouver's current draft plan began in early May and concludes in mid June. It is staff's understanding that a final proposed plan based on

MV's public consultation process will be presented for approval to a GVS&DD Special Waste Management Committee meeting on July 21st and then the GVS&DD Board on July 30th. Following Board endorsement, MV will submit the plan to the Ministry of Environment for review and approval. At the same time, member municipalities will be asked to endorse the ISWRMP based on the municipal commitments contained in the plan. It is understood that any changes to the plan made by the Province will be unilateral and binding.

As reported to Council in staff's May 17, 2010 memo, there has been considerable involvement by staff through the Regional Engineers Advisory Committee (REAC) and the REAC Solid Waste Subcommittee in the development of the strategies and actions related to Goals 1 and 2 (waste reduction and diversion). Conversely, there has been less time and involvement by municipal staff on Goal 3 (energy recovery from waste) and Goal 4 (landfill residuals).

A series of public meetings have been held throughout the lower mainland during the current public consultation process. A workshop for Vancouver Council and staff was held on May 19th at which time a number of questions submitted to MV staff were discussed. A copy of those questions and MV's response received June 8th is included as Attachment 3. On June 3rd MV hosted a local government staff technical forum, which included an overview presentation by MV staff (Attachment 4) and a workshop inviting staff discussion and input.

Municipal Comments

Based on a review of the April 28, 2010 draft ISWRMP and additional information provided by MV, staff's comments are as follows:

General:

- The ISWRMP is intended to provide strategic direction based on planning level assumptions and estimates. Accordingly, strategies and actions proposed in the draft plan are not based on cost-benefit or triple bottom line (economic, environmental and social) analysis, site specific conditions, competitive market based assessment, broad public acceptance, and a determination of affordability. It is estimated that the cost to implement the draft ISWRMP will be in the hundreds of millions of dollars. Once approved by the Province, the ISWRMP will be legally binding. Staff consider there to be significant uncertainty and risk by proceeding to Ministerial approval with the current high-level strategic document without a full assessment of impacts and confirmation of net-benefits.
- 70 percent diversion by 2015 is considered an aggressive target. Regardless, staff consider that the draft ISWRMP could be strengthened by indicating that waste diversion efforts will continue if the goal of 70 percent diversion is reached early.
- In addition to establishing 70 percent diversion as the key metric for regulatory compliance, the draft ISWRMP proposes various metrics to monitor performance. While staff acknowledge there are challenges with accurately tracking waste generation and diversion by individual sector (because, for example, garbage from commercial and multi-family properties is collected in the same vehicle), staff recommend the ISWRMP include additional metrics which enable the monitoring and comparison of performance by sector and/or

waste stream. Staff also recommend the addition of performance metrics which help estimate the success of EPR programs, such as the quantity of material covered by EPR initiatives that is captured in municipal garbage and recycling collection programs. The purpose of adding these metrics would be to assist with future solid waste planning and diversion policy development, and enable strategic decision making on issues such as how and where to best to allocate limited waste diversion resources.

Goals 1 and 2 (Reduce, Reuse, Recycle):

- Staff are generally supportive of Goals 1 and 2 in terms of how strategies and actions are prioritized within the draft ISWRMP, and how EPR is emphasized as the key driver for achieving waste diversion. The primary benefit of expanded EPR for Vancouver and other municipalities is that it continues to shift the responsibility of managing discarded products and packaging materials away from local government to producers and direct consumers. However, positioning EPR in the ISWRMP as the primary strategy for avoiding the generation of waste in the first place (Goal 1) is based on the assumption that EPR is the most effective policy tool in this regard. This may be an objective of EPR policy, but it is staff's understanding that this has not been demonstrated as an outcome. Accordingly, staff recommend MV apply an evidence-based approach to confirm the accuracy of this assumption after implementation of the ISWRMP. Depending on the results of such analysis, the development of alternative or complementary strategies for achieving waste minimization may be required, given waste reduction is the plan's highest priority and there are relatively few strategies and actions under this goal in the current draft ISWRMP.
- Goal 2 in the draft ISWRMP proposes the establishment of Eco-Centres throughout the region. These are envisioned as comprehensive one-stop-drop recycling depots that could potentially also include a commodity reuse component. MV reports the estimated capital cost to implement one Eco-Centre is upwards of $14 million. Annual operating costs are estimated to range from $0.2 to $0.5 million per site and may be offset by recycling commodity revenues, depending on factors such as market conditions, material quality and degree of contamination. While staff support the anticipated merits of this proposal based on an objective of providing convenient recycling drop-off locations for citizens, the following concerns are noted:
  - This proposal is based on conceptual planning and high-level estimates. This results in two concerns, given the ISWRMP will be legally binding upon approval by the Province: 1) the region would be committed to making a sizable, long-term investment prior to the development of a business plan for Eco-Centres and a clear understanding of expected returns; 2) the locations, types of materials to be collected, total number of Eco-Centres required, and the specific role of municipalities and industry product stewards, if any, in the sharing of costs and/or operational responsibilities have not been determined.
  - How capital and operating costs of Eco-Centres will be funded is unclear. MV has indicated funding is anticipated to be by MV and partially offset by lower capital and operating costs for transfer stations. However, since Vancouver is the only municipality in the region that operates its own

transfer station, MV's proposed funding model results in financial risk that is unique to Vancouver compared to the rest of the region.

- Given one of the Plan's highest priorities is waste diversion through expanded EPR, in staff's opinion it would be rational for industry product stewards to share or have complete responsibility for the funding and/or operations of Eco-Centres which accept materials covered by EPR legislation. The development of an Eco-Centre funding model potentially involving product stewardship industries has been mentioned by MV staff as a possibility. However, it is City staff opinion that the ISWRMP should explicitly indicate that the preferred business model for Eco-Centres is one that involves product stewards.
- It is understood that plans are already underway to establish the first Eco-Centre in the City of Surrey, and that future locations will be based on negotiation and terms and conditions developed by a work group comprised of municipal and regional staff after the approval of the ISWRMP. This proposed planning process, along with limited funding, results in a risk of opportunistic and inequitable decision making.

- The implementation of new disposal bans is included in the draft ISWRMP. However, the historical approach taken by MV is to implement disposal bans after recycling market capacity develops to the extent that it at least matches the available supply of material. Staff recommend the ISWRMP take a more aggressive approach with disposal bans for the purpose of driving new recycling market demand. For example, the ISWRMP could indicate that it is the region's aim to implement bans on the disposal of compostable organics and clean wood waste no later than 2015, for the purpose of sending a strong signal to the private sector and generating a recycling market expansion incentive.

- Strategy 2.2 of the draft ISWRMP proposes the continued monitoring and enforcement of disposal bans, and analysis of the effectiveness of bans. Strategy 2.2 also proposes possible alternative enforcement models, including enforcement at source. Staff support these proposals and recommend that increased penalties for non-compliance with disposal bans also be considered as an additional deterrent.

- Strategy 2.4 addresses diversion of demolition, landclearing and construction (DLC) waste, and the draft ISWRMP targets the diversion of about 65 percent of wood waste currently disposed. It is understood that in 2008 approximately 90,000 tonnes of DLC waste was disposed in GVS&DD licensed private landfills, and about 30,000 tonnes was exported out of the region. Staff recommend MV consider opportunities to strengthen GVS&DD By-laws 181 and 183 for the purpose of diverting clean wood waste from disposal in private landfills. Further, in addition to implementing actions focussed on DLC waste diversion at regional facilities, staff recommend MV work with the Ministry of Environment for the purpose of developing options to eliminate the export of DLC waste to out of region landfills and increase the diversion of recyclable DLC material from this waste stream.

- To achieve 70 percent waste diversion by 2015, the draft ISWRMP indicates that recycling net expenditures will increase by 42 percent (from $190 to $270 million/yr) and will be higher than garbage disposal costs estimated as $220 million/yr. To ensure a financial incentive to encourage recycling the draft ISWRMP proposes setting garbage disposal pricing higher than recycling pricing.

This strategy allows recycling costs to be subsidized with surplus revenue generated from garbage tipping fees set higher than cost. While this strategy is generally consistent with current practice, staff note that with reduced waste requiring disposal in the long-term, this strategy results in diminishing returns and may be economically unsustainable. To ensure a stable long-term waste diversion funding source, it is understood that MV's strategy assumes profit will eventually be generated from lower waste disposal operating costs, after debt capital from WTE expansion is retired and when energy revenue increases from expanded WTE district heating systems. However, if this strategy does not materialize, higher than forecasted regional tipping fees will be required to generate a profit. High tipping fees risk leakage of waste out of the regional system, thereby causing an erosion of the region's primary source of waste diversion funding.

The purpose of commenting on this aspect of the draft ISWRMP is to highlight the potential risk associated with this waste diversion funding strategy. In order to mitigate this risk, staff recommend MV:

- determine the price-elasticity of demand of commercial tipping fees;
- assess the performance of this funding strategy upon implementation;
- develop contingency funding options for implementation if waste diversion funding fails to materialized with the current proposed pricing strategy; and
- develop in more detail strategies for controlling commercial waste flow, such as hauler licensing, franchising commercial waste collections, and the 1995 SWMP proposed "split fee" system (details included in Attachment 3).

- As previously indicated in Table 1, the draft ISWRMP targets the diversion of 600,000 tonnes of material for the purpose of attaining an overall diversion goal of 70 percent by 2015. This results in about 600,000 tonnes of primarily recyclable materials still requiring disposal. This proposal is based primarily on the following two key assumptions:
  - that only about one-half of recyclable materials currently disposed as garbage can be captured for recycling, based on the assumption that 70 percent of individuals will recycle 70 percent of the time; and
  - waste diversion efforts will continue to be focussed "at source" (where materials are generated as waste), which requires the collection of different streams of materials.

  In the drafting of the ISWRMP, the option of recovering recyclable materials from mixed waste streams for the purpose of increased waste diversion, but without biological treatment and production of refuse derived fuel (RDF) for incineration was <u>not</u> considered (MV's AECOM study reviewed mechanical, biological treatment (MBT) of waste with and without incineration of RDF). While staff recognize the benefits of multi-sort or "separation at source" recycling systems, staff consider the absence of sufficient material recovery capacity in the region as a significant barrier to achieving a diversion rate beyond 70 percent. That is, there are no "dirty" MRFs (i.e. "material recovery facilities" – operations which involve manual and mechanical separation of recyclable from non-recyclable materials in loads of mixed waste) in operation in the region, and the available capacity of "clean" MRFs (facilities that separate commingled recyclables) remains limited. Accordingly, similar to

what was contemplated but then put on hold in the late 1980s, staff recommend MV assess the:

- environmental, social and economic impacts of developing material recovery capacity in the region;
- advantages and disadvantages of different ownership models; and
- costs and benefits of beneficially utilizing specific residuals resulting from material recovery facilities in different waste conversion technology applications.

Goal 3 (Recover Energy):

- Material provided by MV as part of the ISWRMP consultation process has indicated a preference towards mass burn incineration with energy recovery as the primary strategy for achieving Goal 3. It is staff's understanding that this inclination is the result of MV's experience with the Burnaby WTE mass burn facility, the demonstrated commercial viability of mass burn incineration, and the results of the previously mentioned AECOM study; however, staff note the following concerns:
  - with the recent revision of action 3.1.2 in the draft ISWRMP to include a broad definition of WTE, there is now a disconnect between the current draft plan and the results of the AECOM research since that study did not include a comprehensive review of the costs and benefits of a broad range of WTE technologies;
  - large scale public acceptance of in-region mass burn incineration remains a concern, particularly for residents of the Fraser Valley;
  - the implementation schedule appears optimistic. In staff's opinion, full commissioning of an in-region WTE facility in less than five years does not seem achievable, particularly given the concerns with public acceptance;
  - the current in-region mass burn incineration with district energy recovery proposal is based on planning level estimates and assumptions. In staff's opinion an energy recovery strategy founded on these current estimates and assumptions results in considerable risk. For example, it is understood that seasonal impacts on district heating demand were not considered in the financial analysis, and that modelling assumed a facility will generate revenue at commencement with district energy uptake starting at 50 percent and increasing five percent a year to a maximum of 90 percent, and that BC Hydro will pay a favourable price for electricity. To mitigate uncertainty and risk, current estimates and assumptions should be verified based on commercial conditions.

  Accordingly, staff recommend that MV:

  - undertake an independent review of current estimates, assumptions, sensitivities and risks, including costs, revenues and impacts on air quality and human health with respect to in and out of region mass burn incineration;
  - issue an open market, site specific proposal call for all energy recovery and residuals disposal options;
  - establish an objective and comprehensive proposal evaluation process that considers, among other things, the social, environmental and economic impacts of a wide range of thermal and non-thermal energy recovery technologies;

  - consider the total net-benefit of a suite of different technologies. For example, the benefits of higher risk technologies, in terms of economic development opportunities and potentially greater social acceptability, should be considered in combination with technologies which may result in less economic and technical risk, but may not receive wide ranging public support; and
  - prepare a contingency plan for dealing with residuals if commissioning of WTE capacity is not successful by 2015.

- Action 3.3.2 proposes banning wood waste from "*landfill disposal*". It is understood that the purpose of this action is to divert all wood waste away from landfills for utilization as WTE fuel. Given waste recycling (including composting) is a higher priority over energy recovery, staff recommend this action be deleted and replaced with, "*Ban untreated, clean wood waste from WTE and landfill disposal*" under Goal 2, Strategy 2.4. Further, until a full assessment is made on air quality and other environmental impacts resulting from using treated wood waste as a feedstock material in all of the WTE technologies now listed under ISWRMP action 3.1.2 (including, for example, anaerobic digestion), staff consider it premature to indicate that this material should be used as a WTE feedstock.

- It is understood that in MV's 35 year modelling of waste generation and diversion it was assumed further gains in waste reduction after 2015 will be offset by population growth, resulting in relatively consistent waste quantities requiring disposal. This therefore assumes that per capita waste generation will remain relatively constant starting in 2015. Depending on the extent of current population growth forecasts, this may be considered an overly conservative estimate and one that is contributing to current public concerns regarding "the need to feed" new mass burn incineration capacity, and the apparent contradiction with the plan's highest priority (waste reduction) and emphasis on EPR. As such, staff recommend that the sensitivity of waste generation and reduction be assessed relative to population growth and assumed EPR program expansion to include all packaging materials.

Goal 4 (Residuals Management):

- A critically important issue that is not addressed in the draft plan is a bridging strategy for dealing with residuals after the closure of the Cache Creek Landfill Annex in 2012 and the commissioning of proposed new WTE capacity. Staff recommend that the development of this strategy be given the highest priority. A bridging strategy which proposes the use of the Vancouver Landfill beyond its permitted annual capacity would not be considered acceptable by the City in accordance with what Council resolved in January 2008.

- Regulatory oversight of the Vancouver Landfill is the responsibility of the Ministry of Environment, not Metro Vancouver. Actions 3.2.1 and 4.1.1 propose new and somewhat duplicate regulatory oversight, which adds to the overall cost of implementing the ISWRMP. As such, staff recommend these sections not be included in the ISWRMP.

- The future role of the Vancouver Landfill has been a point of discussion during the recent ISWRMP consultation process. In this regard, there are two issues which staff consider significant:

- As discussed previously, a critically important feature of the GVS&DD-Vancouver-Delta (Tripartite) Agreement is that Vancouver maintains autonomy in the disposal of its solid waste and operation of its disposal facilities, as a condition of Vancouver's participation in the regional SWMP. Autonomy provides Vancouver increased opportunity to pursue new waste diversion initiatives and flexibility with how we manage our waste. Examples of what this autonomy has allowed in the past include the Vancouver Landfill composting facility and the comprehensive recycling depots at both the Vancouver South Transfer Station and Vancouver Landfill. For those reasons and also because of the significant value of the Vancouver Landfill to the City and its residents as confirmed by the previously mentioned 2009 Deloitte report, staff recommend that Council reaffirm this position with respect to the proposed ISWRMP.
- Further, as reported to Council in March 2009, reduced use of the Landfill provides the greatest financial benefit to Vancouver and Delta. Maximizing waste reduction and diversion efforts to extend the life of the Landfill should therefore be key priorities in the Plan. Since maximizing efforts to reduce per capita waste disposed is also consistent with the GCAT's Zero Waste objectives, staff recommend Vancouver, in consultation with the Corporation of Delta and Metro Vancouver, work towards a goal of setting maximum annual disposal tonnage targets which reduce over time and which are less than the Landfill's current permitted annual disposal capacity of 750,000 tonnes. Involving Delta and MV in the development of such a strategy is necessary due to the potential implications with the Vancouver-Delta Agreement, the Tripartite Agreement and a new solid waste management plan.

Progress Update on Development of a City of Vancouver Zero Waste Strategy

In 2009 Council received various Zero Waste recommendations from the Mayor's Greenest City Action Team (GCAT) for Vancouver to significantly reduce solid waste going to landfill or incineration by 2020, and directed staff to develop an implementation strategy. Following Council's direction a staff Steering Committee was formed along with various working groups, including the Zero Waste Working Group comprised of staff from Engineering, Facilities Design and Management, Environmental Protection, Sustainability Group and Legal Services. Work completed by this working group includes a review of GCAT's targets and recommendations, the development of implementation options, and the formation of an External Advisory Group.

Given the implications of the proposed new regional solid waste management plan combined with the need to develop a Zero Waste implementation strategy specific to Vancouver in response to the GCAT's recommendations, in early 2010 staff concluded that an overall vision for solid waste management for Vancouver was required. This led to the recent drafting of the *Solid Waste Stewardship 2020* visioning document enclosed as Attachment 5 and presented herein for information.

An objective in the development of this draft document was to connect GCAT's Zero Waste goals with specific strengths of the proposed new regional solid waste management plan (the ISWRMP). However, the visioning document is intended to serve as a 'made-for-Vancouver solution' for the purpose of aligning with Council's Greenest City goal and assisting with staff's development of a GCAT Zero Waste implementation plan.

The draft *Solid Waste Stewardship 2020* document is comprised of a 10 point plan with specific actions organized under the headings *leadership*, *progressive stewardship*, *community empowerment* and *strategic enforcement*. As an overarching target the stewardship plan proposes that Vancouver become world-class by 2020 in terms of solid waste policies and practices.

Public comment on this draft document will be sought during upcoming public consultation. The results of that process will help inform the development of a detailed Zero Waste implementation plan. Among other things, this plan will include details on estimated waste diversion, implementation costs, benefits, resources, source of funding and timelines, and will be reported back to Council for approval. To assist with the completion of this work a consultant with specific expertise in waste diversion planning and EPR policy development will be retained.

Further, staff consider that there are some specific near term waste diversion opportunities that should be developed with respect to the Vancouver South Transfer Station and Vancouver Landfill. Accordingly, staff recommend the development of:
- strategies for banning the disposal of food scraps and clean wood waste; and
- options for increased penalties for non-compliance with disposal bans.

FINANCIAL IMPLICATIONS

The recommendations contained in this report pose no immediate financial implications.

Following consultation with the Zero Waste External Advisory Committee and preparation of a GCAT Zero Waste implementation plan with full analysis of costs, benefits and source of funding, staff will report back to Council with recommendations and details on financial implications.

With respect to the proposed ISWRMP, the commitments contained in the plan are expected to result significant financial implications to the region and member municipalities. These are summarized in Table 2. Once the ISWRMP is finalized, staff will complete a full review of financial impacts to Vancouver and report back to Council as part of future budget discussions.

Table 2: Summary of Estimated Financial Implications of Draft ISWRMP

Capital Costs*	Gross Operating Costs*	Comments
Goals 1 and 2 – Waste Diversion:		
$170 million	$67/tonne, or $40 million/yr	- Proposed capital expenditures include establishing a network of Eco-Centres, and expanding organic processing

	@ 600,000 tonnes/yr additional material diverted (i.e. 55% to 70% diversion)	capacity and related infrastructure. - Proposed source of operating funding is surplus garbage tipping fee revenue. Vancouver's current contribution to regional recycling expenditures is based on the $2.20 per tonne Regional Waste Reduction and Recycling Rate levied on municipal solid waste disposed and originating from Vancouver. This rate may increase to fund increased regional recycling expenditures, but the extent and full impact of an increase is not currently known. - It is uncertain at this time if City of Vancouver funding will be required for Eco-Centre and/or organic processing facility capital and operating costs.
Goals 3 & 4 – Energy Recovery & Disposal:		
$440 million	$40/tonne, $20 million/yr @ 500,000 tonnes/yr additional incineration capacty	- As reported by MV staff to the Metro Vancouver Finance Committee in July 2009, tipping fees are projected to rise from the current $82 per tonne to $130 per tonne by 2014 (more recent MV tipping fee projections provided to staff suggest that the 2009 forecasts may have been underestimated). - The draft ISWRMP indicates tipping fees will continue to rise during the current planned 15 year amortization period for increased mass burn WTE capacity, and then decrease upon debt retirement. - MV's long range projections for mass burn WTE predicts a positive cash flow, but this is dependent on factors such as the type of technology ultimately selected, the extent of revenue from energy sales, and the financing and ownership structure for new facilities.

*Source: Metro Vancouver

ENVIRONMENTAL IMPLICATIONS

With the implementation of the region's proposed ISWRMP, MV forecasts the regional diversion rate will increase from an average of 55 percent to 70 percent by 2015. However, despite this increase in diversion, MV predicts that by 2015 1.2 million tonnes of solid waste in the region will require disposal.

CONCLUSION

This report provides staff's comments and recommendations on Metro Vancouver's draft Integrated Solid Waste and Resource Management Plan dated April 28, 2010, and presents initial recommendations with respect to work underway by staff on the GCAT's Zero Waste recommendations. Specific concern with respect to MV seeking Provincial approval of a new regional solid waste management plan prior to comprehensive analysis of social, environmental and economic impacts and confirmation of net-benefits of proposed strategies and actions is noted. With these comments and recommendations, staff support MV's efforts to finalize a new solid waste management plan for the region.

* * * * *

APPENDIX 1

The City of Vancouver requests Metro Vancouver:

i) revise the ISWRMP to indicate waste reduction and diversion efforts will continue if the goal of 70 percent diversion is reached in advance of 2015;

ii) incorporate in the ISWRMP additional performance measures to enable the monitoring of solid waste generated and diverted from individual sectors, and materials included in British Columbia Extended Producer Responsibility (EPR) programs;

iii) request the Provincial Government accelerate the expansion of EPR programs, including programs targeting packaging materials;

iv) assess the sensitivity of Metro Vancouver's waste generation and reduction forecasts relative to population growth and planned EPR program expansions for the purpose of determining the accuracy of Metro Vancouver's assumption that waste reduction gains after 2015 will be offset by population growth;

v) apply evidence-based analysis to confirm the effectiveness of EPR programs in reducing the generation of waste;

vi) implement additional and/or complementary waste reduction strategies and actions if waste reduction performance is not achieved through expanded EPR programs;

vii) state in the ISWRMP that an Eco-Centre business plan will involve EPR product stewardship organizations as funding and/or operating partners;

viii) seek GVS&DD Board approval on a comprehensive region-wide Eco-Centre plan which addresses costs, funding, ownership, operating responsibility and municipal equity, in advance of proceeding with the current Eco-Centre concept;

ix) consider increased penalties for disposal ban non-compliance;

x) revise the draft ISWRMP to indicate it is Metro Vancouver's intent to implement disposal bans covering food scraps and clean wood waste no later than 2015;

xi) review opportunities to revise GVS&DD By-laws 181 and 183 for the purpose of increasing the diversion of clean wood waste from private landfill disposal to recycling and composting;

xii) work with the Ministry of Environment to eliminate or reduce the export of demolition, landclearing and construction (DLC) waste outside of the region;

xiii) assess air quality and environmental impacts from using treated wood waste as feedstock material in all of the waste-to-energy (WTE) technologies listed under draft ISWRMP Goal 3 and others that may be considered during implementation of the ISWRMP;

xiv) delete action 3.3.2 under Goal 3 of the draft ISWRMP which states, "*Ban wood from landfill disposal*", and replace with, "*Ban untreated, clean wood from landfill and WTE disposal*" under strategy 2.4 Goal 2;

xv) assess the performance of funding waste diversion programs from excess tipping fee revenue with reducing waste requiring disposal, determine the price-elasticity of demand of commercial regional tipping fees, and fully develop contingency options for controlling the flow of commercial waste within the region;

xvi) assess the environmental, social and economic impacts of developing regional material recovery (waste sorting) capacity, different ownership models, and the costs and benefits of options, including non-thermal technologies, for beneficially utilizing specific residuals remaining after recycling and composting;

xvii) undertake an independent review of current estimates, assumptions, sensitivities and risks, including costs, revenues and impacts on air quality and human health with respect to in and out of region WTE mass burn incineration;

xviii) reconsider draft ISWRMP Goals 3 and 4 subject to an open market request for proposals for all site specific, feasible WTE and landfill disposal options for residual waste materials remaining after recycling;

xix) prepare a contingency plan for dealing with residual solid waste materials if commissioning of the current proposed WTE capacity is not successful by 2015;

xx) prepare a waste disposal bridging plan given implementation timelines of the draft ISWRMP and the expected closure of the Cache Creek Landfill Annex in 2012; and

xxi) delete draft ISWRMP actions 3.2.1 and 4.1.1 since regulatory oversight of the Vancouver Landfill is the responsibility of the Ministry of Environment.

RTS 8751
ATTACHMENT 1

April 28, 2010 Metro Vancouver Draft Integrated Waste and Resource Management Plan

Integrated Solid Waste and Resource Management

A Draft Solid Waste Management Plan
for the Greater Vancouver Regional District and Member Municipalities

DRAFT

April 28, 2010

metro vancouver

www.metrovancouver.org

Table of Contents

Vision Statement

Metro Vancouver has a vision to achieve what humanity aspires to on a global basis – the highest quality of life embracing cultural vitality, economic prosperity, social justice and compassion, all nurtured by a beautiful and healthy natural environment.

We will achieve this vision by embracing the principles of sustainability, not least of which is an unshakeable commitment to the well-being of current and future generations and the health of our planet, in everything we do.

As we share our efforts in achieving this vision, we are confident that the inspiration and mutual learning we gain will become vital ingredients in our hopes for a sustainable common future.

Building a Sustainable Livable Region

Building a sustainable, livable region is the overarching regional vision. Social, environmental and economic sustainability is, therefore, a fundamental objective in all Metro Vancouver activities: from the services we deliver through the management and strategic plans we develop and administer, to the various outreach activities we engage in pursuit of collaborative governance.

As we build and facilitate collaborative processes, including those that engage citizens, and enhance understanding of other levels of government, we are confident that the inspiration and mutual learning we gain will become vital ingredients in our hopes for a sustainable common future.

Goals and Targets

Goals

The overriding principle of Integrated Solid Waste and Resource Management Plan is the avoidance of waste through an aggressive waste reduction campaign and through the recovery of materials and energy from the waste that remains. In line with this principle, the Integrated Solid Waste and Resource Management Plan (IS-WRMP) has four goals:

Goal 1: Minimize waste generation

Goal 2: Maximize reuse, recycling and material recovery

Goal 3: Recover energy from the waste stream after material recycling

Goal 4: Dispose of all remaining waste in landfill, after material recycling and energy recovery

The key strategies and actions to achieve the goals of the ISWRMP are set out in Part B, Goals, Strategies, Actions and Measures.

Targets

The target of the ISWRMP is to increase the regional diversion rate from an average of 55% to 70% by 2015.

Conventionally it has been assumed that the 5Rs hierarchy approximates the sequence of processes in waste management and the goal of reducing, reusing or recycling waste to the maximum extent possible has been measured as the rate of 'diversion' of waste from reaching the fifth step in the hierarchy – the disposal of residuals. Modern reality is more complex. As a result, using the conventionally defined 'diversion rate' includes some source separated material that is used as fuel still being considered 'recycled' while some material that is recycled after incineration is still considered 'disposed.'

This plan is driven by the underlying principles but, for the sake of historic comparability, continues to use the conventional definition of 'diversion rate'.

If the waste reduction and recycling initiatives in the plan are successfully implemented, only 30% of the generated waste stream will require treatment before disposal. Additional waste-to-energy capacity would be made available to recover energy from this stream.

A. Integrated Solid Waste and Resource Management Plan

Guiding Principles

The plan follows the sustainability principles set out in Metro Vancouver's Sustainability Framework, the principles of Integrated Resource Recovery and the 5R hierarchy of resource management.

Sustainability

Sustainability encompasses a long-term commitment to economic prosperity, community well-being and environmental integrity. It is at the core of Metro Vancouver's vision for the future, and provides the foundation for the development of the region's management plans.

The Metro Vancouver Sustainability Framework identifies three overarching principles which state that decision making must:

- Have regard for both local and global consequences, and long-term impacts
- Recognize and reflect the interconnectedness and interdependence of systems
- Be collaborative

These provide the foundation for the three operating principles that guide Metro Vancouver:

- Protect and enhance the natural environment (Conserve and develop natural capital)
- Provide for ongoing prosperity (Conserve and develop economic capital)
- Build community capacity and social cohesion (Conserve and develop social capital)

A solid waste management plan which follows these principles will seek to ensure our individual and collective behaviour does not generate avoidable or unnecessary material waste and will seek systems and technologies which recover and recycle materials and recover energy.

Where investment or reinvestment in infrastructure is required, that infrastructure will be resilient, be adaptable to climate change, lessen the region's dependence on non-renewable energy sources, and protect the environment.

Integrated Resource Recovery

Integrated Resource Recovery is an approach to designing and managing urban systems, particularly utilities, to generate synergies which enable the 'waste' from one system to become 'resources' for another.

These traditional wastes are untapped resources. If accessed and used appropriately, they can help preserve non-renewable resources, stretch the capacity of existing infrastructure, save energy, generate revenue, protect the environment and reduce greenhouse gas (GHG) emissions.

Resource Management Principles: The 5Rs

The principles of the 5R hierarchy also emphasize the value of waste as a resource. The hierarchy sets out the relative value of different methods of waste management:

- **R**educe waste at source
- **R**euse where possible
- **R**ecycle products at the end of their useful life
- **R**ecover energy or materials from the waste stream
- Manage **R**esiduals in an environmentally sound manner

Process and Consultation

All actions included in this plan will be undertaken in consultation and cooperation with municipalities, senior government, First Nations, the business community, and the public.

As the population grows and circumstances change, the ISWRMP will be reviewed and revised. An ISWRMP progress report will be made every two years and a comprehensive review of the plan every ten years.

Aligning With Provincial Initiatives

This is a provincially mandated plan. The objectives set out in the 1995 Greater Vancouver Regional Solid Waste Management Plan were set by the Provincial Government. These objectives were:

- To reduce per capita garbage disposal in the year 1995 by at least 30% from 1990 levels
- To similarly reduce per capita garbage disposal in the year 2000 by at least 50% from 1990 levels
- To responsibly manage residuals

These objectives have been met.

The updated ISWRMP is guided by principles that are aligned with current provincial policies and positions, ensuring that Metro Vancouver's and senior governments' environmental and fiscal objectives and actions are mutually supportive and successful.

Key provincial plans and policies supported by the ISWRMP include the:

- **BC Climate Action Plan.** This plan sets a provincial target of 33% less greenhouse gas emissions by 2020, and 80% fewer by 2050.

  The ISWRMP will contribute to meeting these targets by facilitating waste reduction and by treating waste as a resource to be reused or recycled.

- **BC Energy Plan - A Vision for Clean Energy Leadership.** The Energy Plan sets goals for clean, self-sufficient electricity production including "clean energy leadership" and energy self-sufficiency by 2016. The ISWRMP seeks to expand the generation of electricity and biofuels from municipal solid waste as well as the recovery of heat for use in industrial or district heating systems.

- **A Guide to Green Choices - Ideas and Practical Advice for Land Use Decisions in BC Communities.** This guide expressed the need for "sustainable infrastructure". The long-term sustainable management of existing and future infrastructure investments requires integrated, innovative solutions.

  The ISWRMP contains actions that support sustainable infrastructure, such as clean energy from district energy systems.

- **LiveSmart BC.** This program aims to support low-carbon communities through incentives for energy savings and GHG reduction in homes and businesses, on the road, and in the community.

  The ISWRMP facilitates opportunities for the residential and commercial sectors to reduce their contribution to GHG emissions through waste reduction, reuse, recycle and regional organic waste management.

- **BC Bioenergy Strategy.** The Strategy encourages the production of fuel from biomass.

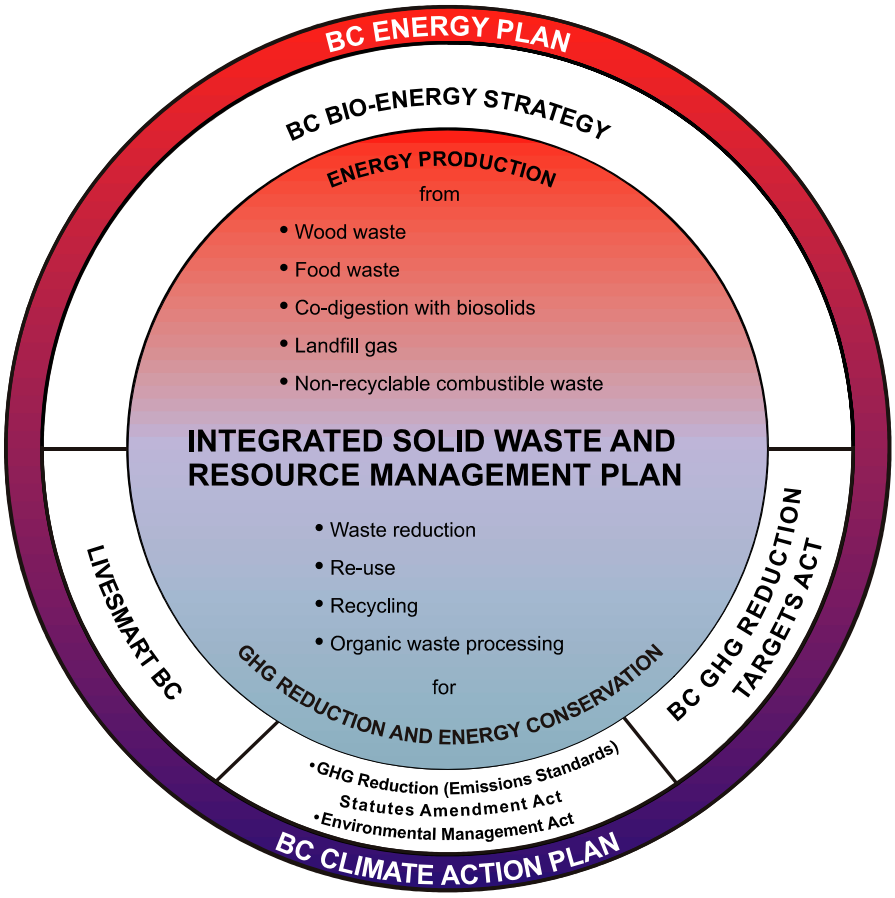
  The ISWRMP builds upon existing efforts involving the recovery of methane from landfills. It also promotes additional diversion of biomass, such as food residues and treated wood, for use as renewable sources of energy. Opportunities to integrate liquid and solid waste management also support the BC Bioenergy Strategy.

- **Landfill Gas Management Regulation.** This regulation requires landfills to consider designs that optimize methane capture, reducing greenhouse gas emissions.

  Existing and any future Metro Vancouver landfills under the ISWRMP will follow this regulation, contributing to the climate change solution.

In partnership with municipalities and the private sector, Metro Vancouver's initiatives in all of these areas will reduce greenhouse gas emissions, diversify the region's sources of energy, increase renewable energy sources, and increase the region's energy independence, as shown in Figure 1.

FIGURE 1: KEY CONNECTIONS BETWEEN PROVINCIAL PLANS AND METRO VANCOUVER'S INTEGRATED SOLID WASTE AND RESOURCE MANAGEMENT PLAN



Coordinating With Other Metro Vancouver Plans

The Sustainable Region Initiative provides a framework for linking the ISWRMP with the region's other plans, as shown in Figure 2. It also establishes links across regionally mandated plans and with initiatives that are executed by other partners.

The ISWRMP identifies synergies with Metro Vancouver's other utilities and plans, to make the best use of society's resources, and to minimize the region's impact on the environment.

The ISWRMP includes coordinated actions with the Integrated Liquid Waste and Resource Management Plan, chosen to identify opportunities to make best use of the resources generated from the two waste streams. For example, organic municipal solid waste, like waste food, can potentially be co-digested with sewage sludge.

The principles guiding the ISWRMP and the connected goals and actions will also help achieve objectives in the Air Quality Management Plan and Metro Vancouver 2040, the region's Regional Growth Strategy. The ISWRMP will minimize Metro Vancouver's contribution to climate change by reducing the disposal of untreated waste in landfills, by recovering energy in the form of heat for district heating, and by reducing the use of fossil fuels for space heating. These steps will assist in building compact, complete communities using clean energy for district heating.

Figure 3 shows the connections between the ISWRMP and other regional plans.

FIGURE 2: METRO VANCOUVER SUSTAINABILITY FRAMEWORK

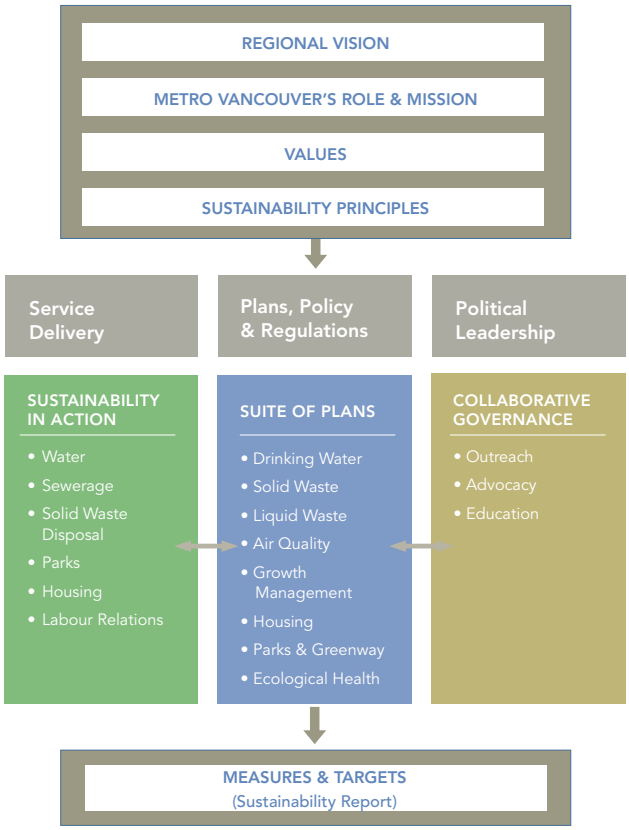
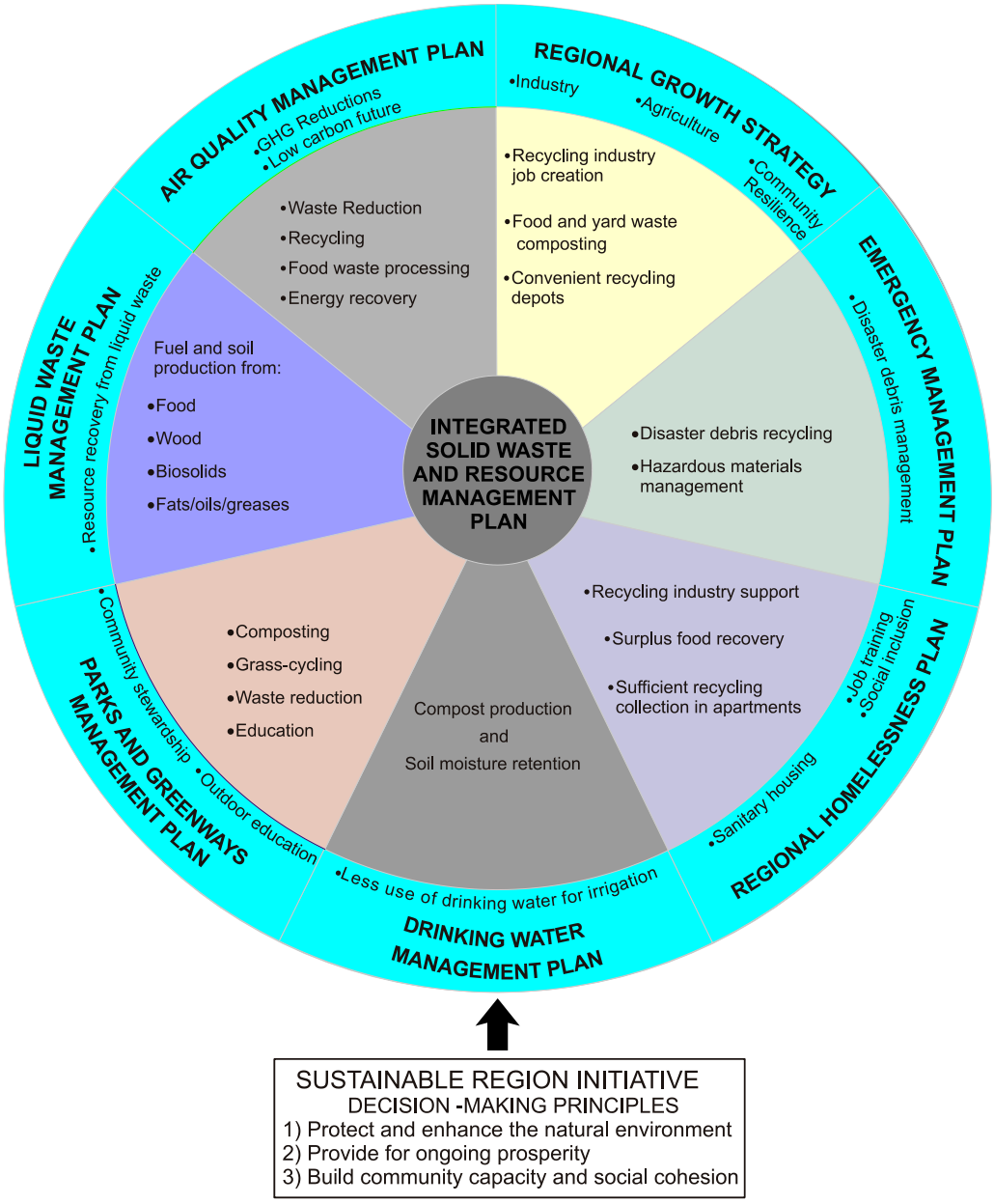


FIGURE 3: KEY CONNECTIONS BETWEEN METRO VANCOUVER'S INTEGRATED SOLID WASTE AND RESOURCE MANAGEMENT PLAN AND OTHER METRO VANCOUVER PLANS



Governance, Roles and Responsibilities

Solid waste management plans are authorized and regulated through the BC Environmental Management Act. Once each updated plan is approved, it becomes a regulatory document for solid waste management.

Metro Vancouver and member municipalities work collaboratively to provide waste management services to the region. Metro Vancouver coordinates the long-range planning process for recycling and disposing of solid waste in the region. Metro Vancouver also funds and manages the operating contracts for the transfer stations, waste-to-energy facility and landfill (with the exception of the Vancouver South Transfer Station and the Vancouver Landfill which are owned and operated by the City of Vancouver) that make up the region's integrated solid waste management system.

Municipal solid waste (MSW) is defined as refuse that originates from residential, commercial, institutional, demolition, land clearing or construction sources.

For management purposes, waste is generated from three sectors: residential (from both single-family units and multi-family units); industrial, commercial and institutional (ICI); and demolition, land clearing and construction (DLC). Member municipalities operate or co-ordinate the collection of recyclables and garbage and in some cases yard and garden waste from the single-family residential sector and some ICI and multi-family residential sources. Recycling from multi-family residences is also collected by municipalities, but much of the ICI and multi-family residential garbage collection services are provided by the private sector. ICI recycling is collected almost exclusively by private haulers. The third sector, DLC, is primarily self-managed with businesses and non-profit societies providing recycling, transferring and/or disposal services.

The management of household hazardous wastes is carried out by the Province primarily through Extended Producer Responsibility (EPR) programs. Provided financial and liability issues are satisfied, Metro Vancouver and member municipalities will cooperate with the Province and industry groups to provide a comprehensive household hazardous waste management program.

All the recycling processing facilities in the region are privately run businesses, as are the brokers who facilitate the movement of recyclables to end markets inside and outside of the region.

The extent and complexity of the solid waste systems, with roles and responsibilities spread across several levels of governance, require close co-ordination among the following groups:

Federal Government

- The Federal Government regulates waste management facilities on federal lands and on First Nation Reserves.

Provincial Government

- Ministry of Environment
- Ministry of Community and Rural Development
- Ministry of Health
- Environmental Assessment Office

Local Government

- Member municipalities implement municipal actions in the ISWRMP and are mandated to manage solid waste
- Metro Vancouver implements regional actions in the ISWRMP, takes a collaborative role for some actions, and is required to report on ISWRMP progress

First Nations

- First Nations have constitutional rights which must be taken into account in the planning process

Private Sector

- Private sector businesses generate waste which requires management under the ISWRMP
- Private sector haulers, material brokers, recyclers and others provide services which make the implementation of an integrated waste management system possible

Non-profit Sector

- Provides voluntary services to segments of the waste generating public

Residents

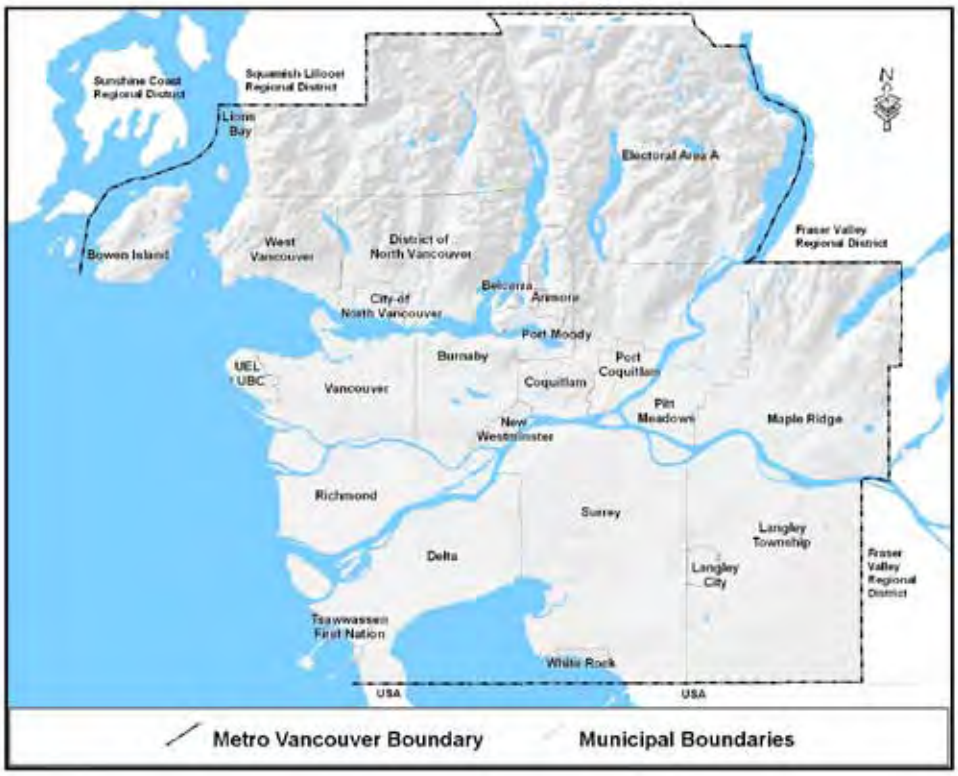
- Generate waste either as private individuals or as contributers to institutional, commercial, industrial, demolition, land clearing or construction activities
- Responsible for carrying out proper waste reduction, recycling and disposal activities

Geographic Scope

The ISWRMP applies to the geographic area of Metro Vancouver (see Figure 4). All strategies and actions in the ISWRMP apply to the members of the Greater Vancouver Regional District.

City of Abbotsford
Village of Anmore
Village of Belcarra
Bowen Island Municipality
City of Burnaby
City of Coquitlam
Corporation of Delta
City of Langley
Township of Langley
Village of Lions Bay
District of Maple Ridge
City of New Westminster
City of North Vancouver
District of North Vancouver
City of Pitt Meadows
City of Port Coquitlam
City of Port Moody
City of Richmond
City of Surrey
City of Vancouver
District of West Vancouver
City of White Rock
Tsawwassen First Nation
Electoral Area A – *which includes the west side of Pitt Lake, the northern portion of Indian Arm, a portion of land between the District of West Vancouver and Squamish Lillooet Regional District (excluding the Village of Lions Bay), the islands of Bowyer, Passage and Barnston, the University Endowment Lands (including Pacific Spirit Regional Park), and the University of British Columbia*

FIGURE 4: MAP OF PLAN AREA



Approved Facilities

Municipal solid waste in the region can be directed for disposal to any approved disposal facility identified in the ISWRMP.

Approved disposal facilities include the:

- Waste-to-Energy facility in Burnaby
- Vancouver Landfill
- Cache Creek Landfill
- Any disposal facility licensed by Metro Vancouver under the Greater Vancouver Sewerage and Drainage District Municipal Solid Waste and Recyclable Material Regulatory Bylaw No. 181, 1996 as amended by Bylaw No. 183, 1996
- Any new waste-to-energy facility established through a competitive process and subject to an environmental assessment as required by provincial and federal regulation

Since the 1995 SWMP was approved the following disposal facility has been closed:

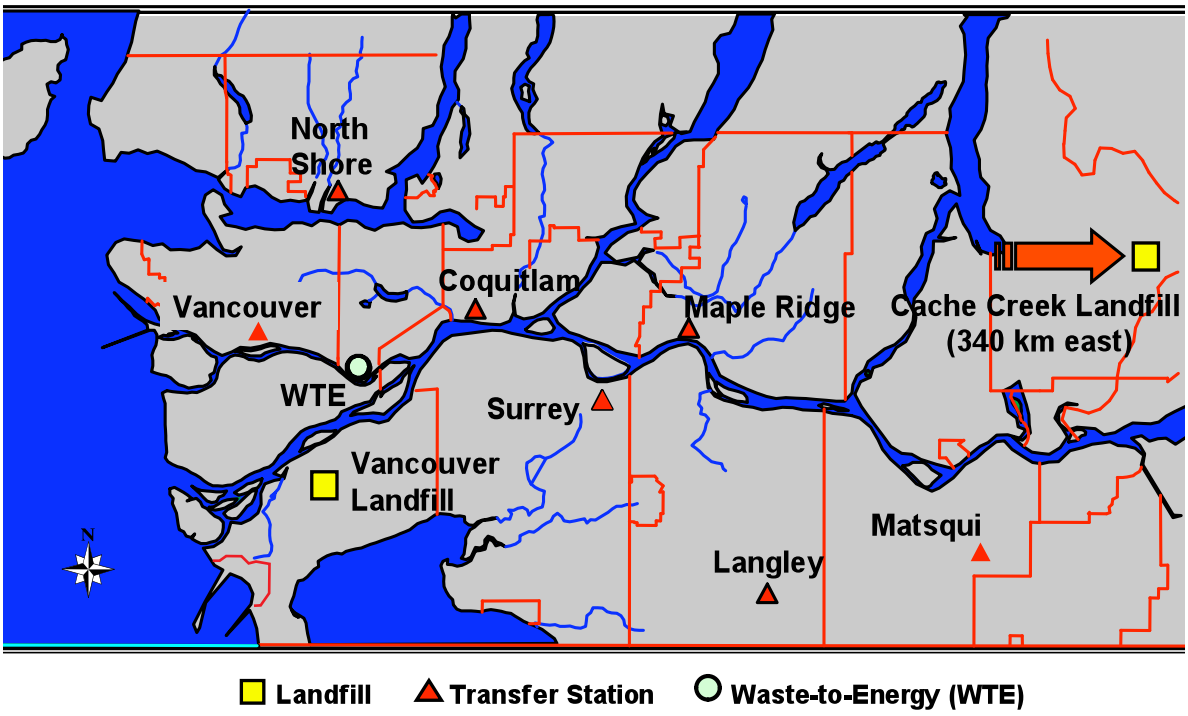
- Port Mann Landfill

In addition to the approved disposal facilities, the following transfer stations are an integral part of the Metro Vancouver integrated waste management system:

- North Shore Transfer Station
- Vancouver South Transfer Station
- Coquitlam Transfer Station
- Surrey Transfer Station
- Langley Residential Transfer Station
- Maple Ridge Residential Transfer Station
- Matsqui Transfer Station

The locations of the Metro Vancouver and City of Vancouver facilities are shown in Figure 5.

FIGURE 5: MAP OF APPROVED FACILITIES



New Facilities

The Ministry of Environment will be informed and consulted regarding the addition of new waste-to-energy facilities. Metro Vancouver will develop a public consultation plan as required by the environmental assessment process.

The addition of new facilities not contemplated in this plan will require an amendment to the plan. The addition of new facilities which are not disposal facilities will not necessitate an amendment to this plan.

First Nations Lands

Unknown quantities of waste from Metro Vancouver, primarily from the DLC sector, are disposed in landfills located on First Nations lands both outside and inside the Metro Vancouver geographical area. Metro Vancouver has no jurisdiction for these landfills.

B. Goals, Strategies, Actions and Measures

Goal 1: Minimize Waste Generation

The following strategies and actions are proposed to achieve this goal:

STRATEGY 1.1

Advocate that senior governments transfer additional waste management responsibilities to producers and consumers

The costs and responsibilities of waste management have historically been borne by local governments and taxpayers. The responsibility for the costs and risks to manage end-of-life products should progressively transfer to the manufacturers of goods and the consumers that use them to provide the appropriate market mechanism to encourage more sustainable manufacturing and consumer choices.

METRO VANCOUVER WILL:

1.1.1 Be a strong advocate for Extended Producer Responsibility (EPR). *Ongoing*

1.1.2 Participate on Federal EPR initiatives such as the Canadian Council of Ministers of Environment (CCME) Extended Producer Responsibility Task Force, to develop national guidelines for sustainable packaging. *Ongoing*

1.1.3 Participate on industry stewardship advisory committees. *Ongoing*

1.1.4 Participate on the BC Product Stewardship Council to assist in evaluating existing and developing new EPR programs. *Ongoing*

MUNICIPALITIES WILL:

1.1.5 Partner with Metro Vancouver in support of actions 1.1.1 through 1.1.4 *Ongoing*

ACTIONS REQUESTED OF OTHER GOVERNMENTS AND AGENCIES:

1.1.6 Ministry of Environment to create a formal partnership with Metro Vancouver representation, to accelerate EPR program development and implementation. *2010*

STRATEGY 1.2

Reduce or eliminate materials entering the solid waste system which hinder or limit the opportunities to achieve reuse, recycling, or energy recovery, or that may exacerbate environmental impacts of disposed residuals

Some inputs to the solid waste stream may hinder or limit the opportunities to achieve reuse, recycling, or energy recovery, or may exacerbate environmental impacts of disposed residuals. These inputs will be identified and programs developed to reduce or eliminate them. This strategy also applies to Goal 2.

METRO VANCOUVER WILL:

1.2.1 Work with disposal facility operators, local municipalities and the recycling industry. *Ongoing*

(a) to introduce material bans after suitable public information programs. *Ongoing*

STRATEGY 1.3

Provide information and education on options to reduce waste

The amount of waste we produce is directly linked to the amount and type of goods and services we consume. Providing the public and businesses with an awareness of the consequences of unsustainable behaviour and tools and incentives to change will assist in reducing the generation of waste.

METRO VANCOUVER WILL:

1.3.1 Develop and deliver a community social marketing based program to inform and educate citizens on waste reduction opportunities including schools. *Ongoing*

(a) Promote a minimum of 70% diversion goal over all sectors – feature in communication materials. *Ongoing*

1.3.2 Develop and deliver a community social marketing based business education plan, including business guides and other outreach programs to inform and educate businesses on waste reduction opportunities. *2011*

MUNICIPALITIES WILL:

1.3.3 Partner with and assist Metro Vancouver in the development and delivery of public and business information and education programs. *Ongoing*

Goal 2: Maximize Reuse, Recycling and Material Recovery

Strategies to achieve this goal focus on proactive approaches to reuse, increased recycling effort and implementation of a region-wide food waste composting program.

Strategy 2.1
Increase the opportunities for reuse

Increasing the opportunities for individuals to reuse more materials involves increasing convenience and reducing impediments.

METRO VANCOUVER WILL:

2.1.1 Investigate financial and regulatory barriers which prevent or discourage the reuse of materials. *2011*

2.1.2 Investigate the effectiveness and adequacy of existing material exchange networks. *2011*

2.1.3 Bring forward appropriate measures which respond to the findings of 2.1.1 and 2.1.2. *2011*

2.1.4 Enhance partnerships with the Province, industry and academia to research and develop solutions to overcome barriers to recycling and new opportunities to re-engineer recycled material. *2011*

MUNICIPALITIES WILL:

2.1.5 Work with Metro Vancouver to give effect to 2.1.1, 2.1.2, 2.1.3 and 2.1.4. *Ongoing*

Strategy 2.2
Increase the effectiveness of existing recycling programs

Use the existing infrastructure effectively to achieve higher recycling rates.

METRO VANCOUVER WILL:

2.2.1 Implement disposal bans on materials that limit opportunities to achieve reuse, recycling, or energy recovery. *Ongoing*

(a) Work with disposal facility operators, local municipalities and the recycling industry to determine the impact and source of components of the waste stream, the consequence and feasibility of banning materials with the most negative impacts and the most suitable recycling options for those materials. *Ongoing*

(b) Continue the monitoring and enforcement of the disposal bans. *Ongoing*

(c) Introduce material bans as determined by 1.2.1 (a) after suitable public information programs. *Ongoing*

(d) Analyse the effectiveness of disposal bans and possible alternative enforcement models including enforcement at source. *2010*

(e) After suitable public information programs, expand disposal bans to include materials encompassed by new EPR programs and material for which new recycling markets are developed. *Ongoing*

2.2.2 Inform businesses and residents of recycling opportunities. *Ongoing*

(a) Continue and upgrade a regional web-based source of information on recycling opportunities for businesses and residents. *Ongoing*

(b) Keep municipalities fully informed as to recycling collection and drop off facilities and changes to policies and facilities. *Ongoing*

(c) Provide outreach services. *Ongoing*

2.2.3 Increase the efficiency and consistency of recycling collection services across the region. *2012*

(a) Work with municipalities to review materials accepted for recycling from residential and ICI sources. *2012*

(b) In collaboration with municipalities, undertake a business case review of the residential and ICI waste and recycling collection services over the region to determine and implement the appropriate level of consistency between municipalities. *2012*

2.2.4 Establish Eco-Centres. *Ongoing*

(a) Establish a work group to determine the terms and conditions for participating municipalities and industries and the means of integrating Eco-Centres into Metro Vancouver's transfer station system and municipal depot systems. *Ongoing*

(b) Develop the model of Eco-Centres, new one-stop-drop centres for recycling. *Ongoing*

(c) With municipalities, determine the terms and conditions for participating municipalities and industries and develop appropriate business cases. *Ongoing*

(d) After determining terms and conditions, establish the first Eco-Centre in Surrey. *Ongoing*

(e) Progressively expand the Eco-Centre system across the region as municipal business cases determine. *Ongoing*

2.2.5 Promote recycling at festivals and events. *Ongoing*

(a) Complete pilot studies on Zero Waste initiatives at festivals and events. *Ongoing*

(b) Develop a Zero Waste toolkit for festivals and events. *Ongoing*

(c) Continue to work with municipalities, EPR groups and local community groups to implement waste minimization and recycling at community festivals and events, including conferences and tradeshows. *Ongoing*

(d) Provide outreach services. *Ongoing*

2.2.6 Work with schools to conduct pilot programs to promote waste reduction and recycling. *Ongoing*

(a): Develop instructional programs that encourage waste reduction and recycling both within the schools and at home. *Ongoing*

MUNICIPALITIES WILL:

2.2.7 Work with Metro Vancouver on actions designed to: *Ongoing*

(a) implement disposal bans; *Ongoing*

(b) inform businesses and residents of recycling opportunities; *Ongoing*

(c) increase the efficiency and consistency of recycling collection services across the region; *Ongoing*

(d) establish Eco Centres; *Ongoing*

(e) promote recycling at community events and festivals; *Ongoing*

(f) work with schools to conduct pilot programs to promote waste reduction and recycling. *Ongoing*

Strategy 2.3: Facilitate increased private sector recycling

There is a shortage of recycling processing capacity for many materials within the region. Metro Vancouver and member municipalities can assist in addressing this shortage by using tools at its disposal to change the business environment so that the private sector can increase capacity.

METRO VANCOUVER WILL:

2.3.1 Facilitate the siting of private sector recycling activities. *2012*

(a) Review the GVS&DD Solid Waste Regulatory Bylaw to facilitate the siting of municipal solid waste facilities that meet municipal bylaws. *2012*

2.3.2 Foster research and market development for recycled materials. *Ongoing*

(a) Evaluate a business case for a regional scale recyclable service delivery model. *2010*

(b) Review desirability, feasibility and opportunity for establishing a non-profit organization to facilitate the development of recycling businesses and markets, along the lines of the 'London Remade' model in the U.K. *2012*

(c) Subject to the results of 2.3.2 (a) and (b), establish a regional role in processing and marketing of recycled materials, a land acquisition strategy for required recycling facilities, and enhanced policy-based initiatives to promote local recycled content in consumer goods. *Ongoing*

MUNICIPALITIES WILL:

2.3.3 Facilitate the siting of private sector recycling activities. *2012*

(a) Review zoning bylaws to remove unnecessary impediments to and encourage recycling and material recovery activities in appropriately zoned areas. *2012*

2.3.4 Work with Metro Vancouver on the evaluation of regional scale recycling facilities and development of recycling markets. *Ongoing*

ACTIONS REQUESTED OF OTHER GOVERNMENTS AND AGENCIES:

2.3.5 Provincial and Federal Governments to identify and establish minimum post-consumer recycled content requirements for consumer goods. *2012*

Strategy 2.4: Target demolition, land clearing and construction (DLC) sector for increased reuse and recycling

Although the DLC sector has very high recycling rates due to high levels of concrete and asphalt recycling, there are significant opportunities to improve with respect to a variety of other materials such as wood and roofing.

METRO VANCOUVER WILL:

2.4.1 Encourage reuse of wood. *2010*

(a) Examine and, where feasible, implement incentives for reuse and remove barriers to re-use of wood waste. *2010*

(b) Develop and implement information and education programs on the reuse and effective recycling of DLC waste. *2010*

2.4.2 Implement waste reduction strategies directed toward diverting DLC waste from disposal while supporting opportunities for beneficial use. *Ongoing*

(a) Encourage the role of building supply retailers and producers in the collection of DLC material for recycling. *Ongoing*

(b) Provide areas for separated recyclable DLC materials at Eco-Centres and at transfer stations as they are upgraded. *Ongoing*

2.4.3 In collaboration with municipalities and industry groups, develop a policy and amendment to this plan to regionally mandate DLC recycling at the job site by December 2011. A schedule for implementation will be part of the policy. *2011*

2.4.4 Review existing DLC recycling and processing capacity, project future needs and develop a strategy to address any identified gaps. *2012*

MUNICIPALITIES WILL:

2.4.5 Work with Metro Vancouver to develop a policy and amendment to this plan to regionally mandate DLC recycling at the job site by December 2011. *Ongoing*

(a) Review municipal DLC permitting processes with a view to requiring waste management plans as a condition of such permits. *Ongoing*

(b) Review the desirability and feasibility of deposit systems or other financial incentives to increase enforcement of DLC waste management plans. *Ongoing*

ACTIONS REQUESTED OF OTHER GOVERNMENTS AND AGENCIES:

2.4.6 Provincial Government to expand the inclusion of the reuse of wood in building codes. *Ongoing*

Strategy 2.5: Reduce paper and paperboard being disposed

19% of the disposed waste stream is made up of paper and paperboard, much of which should be included in the existing recycling programs. Food contaminated paper which cannot be recycled can be composted along with other organics to produce a reusable and beneficial product.

METRO VANCOUVER WILL:

2.5.1 In collaboration with municipalities, conduct pilot programs to determine the most effective method of reducing unwanted junk mail and other publications and act accordingly on the results. *Ongoing*

2.5.2 Promote reduced paper use and increase paper recycling opportunities in the community and businesses. *Ongoing*

(a) Carry out a community social marketing campaign to determine and overcome barriers to reducing the use of and increasing the recycling of paper in schools and community facilities. *Ongoing*

(b) Carry out a targeted outreach campaign to business to determine and overcome barriers to reducing the use of and increasing the recycling of paper. *Ongoing*

MUNICIPALITIES WILL:

2.5.3 Collaborate with Metro Vancouver in junk mail reduction pilot programs and community social marketing programs in community facilities. *Ongoing*

Strategy 2.6: Target organics for recovery

Food waste comprises 21% of the waste disposed. This, along with yard and garden waste and some paper and paperboard can be composted together in a source separated stream to produce a beneficial and marketable product which includes compost and bio-fuel.

METRO VANCOUVER WILL:

2.6.1 Evaluate options for processing of organics with biosolids and other utility residuals. *2010*

(a) Complete trials on commingling food waste with wastewater solids to produce bio-fuels. *2010*

(b) Determine costs and benefits of commingling biosolids with other residuals. *2010*

(c) Bring forward appropriate actions based on results of 2.6.1 (a) and 2.6.1 (b). *2010*

2.6.2 Divert organics from the waste stream *Ongoing*

(a) Establish one or more organics processing facilities. *Ongoing*

(b) Determine which paper and paperboard products are suitable for processing at an organics management facility. *Ongoing*

(c) In collaboration with municipalities, develop and implement a work plan for the diversion of organic waste, including food waste, from: *Ongoing*

i) single family residences. *Ongoing*

ii) multi-family residences. *Ongoing*

iii) the ICI sector. *Ongoing*

(d) Develop and implement supporting communication programs for 2.6.2 (c). *Ongoing*

MUNICIPALITIES WILL:

2.6.3 In collaboration with Metro Vancouver, develop and implement a work plan for the diversion of organic waste from single family residences, multi-family residences, and the ICI sector, including appropriate supporting communication programs. *Ongoing*

(a) Municipalities will divert organics from the waste stream to a Metro Vancouver or alternative licensed organics processing facility. *Ongoing*

(b) Municipalities will report the tonnage of diverted organic waste to Metro Vancouver in the event that organics are delivered to licensed non-regional processing facilities. *Ongoing*

Strategy 2.7: Target plastics for increased recycling

Many plastics can be used to create new products. Recycling plastics reduces the amount of waste that must be transported, treated, and landfilled and conserves a non-renewable resource.

METRO VANCOUVER WILL:

2.7.1 Expand the recycling of plastics in the residential and commercial sectors. *2011*

(a) Establish a standard for municipal programs for collection of plastics based on market strength. *2011*

(b) In cooperation with retail partners and municipalities, undertake social marketing pilot programs to reduce the use of disposable take-out food and beverage packaging including plastic and other disposable bags. *2011*

MUNICIPALITIES WILL:

2.7.2 Work with Metro Vancouver on programs to reduce the use of disposable take-out food and beverage packaging including plastic and other disposable bags. *2011*

ACTIONS REQUESTED OF OTHER GOVERNMENTS AND AGENCIES:

2.7.3 The Provincial Government to develop EPR programs for all plastics that provide incentives for alternatives to non-recyclable plastics. *Ongoing*

2.7.4 The Provincial and Federal Governments to require all plastic material sold in BC to have a material code identifying its composition. *Ongoing*

Strategy 2.8: Target multi-family and industrial, commercial and institutional (ICI) sectors to improve diversion rates

Multi-family residences and the commercial sector have relatively low diversion rates, in part because many premises do not have adequate facilities to accommodate recycling.

METRO VANCOUVER WILL:

2.8.1 Develop bylaws to require recycling in all multi-family and commercial buildings and complexes. *2011*

(a) Develop a model bylaw and enforcement model to require recycling in multi-family and commercial buildings. *2011*

(b) Create an advisory service for recycling programs for multi-family and commercial buildings. *2011*

MUNICIPALITIES WILL:

2.8.2 Work with Metro Vancouver to implement recycling in multi-family and commercial buildings. *2011*

Goal 3: Recover Energy from the Waste Stream After Material Recycling

The following strategies will increase processing of the waste remaining after recycling in order to provide the highest beneficial use to society.

Strategy 3.1: Use Waste-to-Energy to provide electricity and district heating

Waste-to-Energy facilities most effectively and efficiently extract energy from the waste stream remaining after recycling and when combined with district heating can reduce the environmental impacts of energy use within the region. The planned capacity of such facilities should be compatible with waste diversion targets and initiatives and projected waste flows which remain after such diversion.

METRO VANCOUVER WILL:

3.1.1 Continue use of existing waste-to-energy facility in Burnaby.

(a) Use the facility at its optimal capacity to recover available energy in the waste remaining after recycling for district energy and electricity generation. *Ongoing*

(b) Continue to improve environmental performance of the facility with improved technologies and monitor performance to ensure compliance with environmental regulations and objectives. *Ongoing*

3.1.2 Expand the use of waste-to-energy within the region. *2015*

For the purpose of assessment, waste-to-energy may include, but not necessarily be limited to:

- targeted incineration
- industrial use of refuse derived fuel
- gasification/pyrolysis
- anaerobic digestion

or a combination of technologies

(a) Establish a limit of 500,000 tonnes per year of new waste-to-energy capacity within the region in one or more facilities.

(b) Ensure implementation of new waste-to-energy capacity maximizes energy recovery for use in district heating, industrial applications and electricity generation.

(c) Monitor trends in waste reduction, recycling and waste flows and implement additional waste-to-energy capacity if, and only if, justified on the basis of these trends.

(d) Scale any additional waste-to-energy capacity so that total waste-to-energy capacity in the region does not exceed the most probable minimum waste flow projected over the economic life of those facilities.

(e) Monitor the waste-to-energy facility (ies) to ensure compliance.

3.1.3 Locate new waste-to-energy capacity within the Region on the basis of: *2015*

site availability; suitability of site for providing district heating from recovered energy; potential for site to optimize network of transfer stations; results of local screening level impact assessment and triple bottom line analysis; and results of community consultation process for each potential site.

3.1.4 If expanded use of waste-to-energy within the region is not possible then establish waste-to-energy capacity outside the region.

(a) Establish a limit of 500,000 tonnes per year of new waste-to-energy capacity outside the region.

(b) Ensure implementation of new waste-to-energy capacity maximizes energy recovery

for use in district heating, industrial applications and electricity generation.

(c) Monitor trends in waste reduction, recycling and waste flows and implement additional waste-to-energy capacity if, and only if, justified on the basis of these trends.

(d) Scale any additional waste-to-energy capacity so that total waste-to-energy capacity does not exceed the most probable minimum waste flow projected over the economic life of those facilities.

(e) Monitor the waste-to-energy facility(ies) to ensure compliance.

3.1.5 Locate new waste-to-energy capacity outside the Region on the basis of: site availability; suitability of site for maximum energy recovery; results of local screening level impact assessment and triple bottom line analysis; and the results of community consultation for each potential site.

3.1.6 Ensure that new waste-to-energy facilities are designed to maximize the environmental, financial and social benefits of facilities. *2015*

(a) Evaluate cost/benefits of proposed new facilities over their lifetime, including construction, commissioning, operation and maintenance, future retrofits and decommissioning impacts.

(b) Conduct an environmental impact assessment of the waste-to-energy facility(ies), based on applicable provincial and federal government requirements.

(c) Evaluation criteria will include: use of best available commercial technology; emissions outperform applicable environmental standards; alignment with sustainability principles; electricity and district heating production; beneficial use of ash; metals recovery; potential local job creation; and opportunities for research and education.

3.1.7 Recover metals and ash from new and existing waste-to-energy facilities for beneficial use. *Ongoing*

(a) Work with regulatory agencies to identify and remove barriers to beneficial use of ash.

(b) Maximize metal recovery from the waste stream after recycling.

(c) Process bottom and fly ash to generate products for beneficial use.

(d) Use processed bottom and fly ash beneficially for highest value applications available.

(e) Establish supply agreements to provide bottom and fly ash for beneficial use.

3.1.8 Recover energy from regional utility materials that cannot be recycled, including liquid waste and water utilities *Ongoing*

(a) Recover energy from drinking water treatment processes, such organic filter media that cannot be recycled.

(b) Use waste-to-energy to process grit and screenings from wastewater treatment for beneficial uses, where appropriate.

(c) Use reclaimed water from wastewater treatment plants in waste-to-energy steam generation or district heating, if viable.

Strategy 3.2: Recover energy from other solid waste management facilities

Valuable methane in landfill gas will be captured and used to generate clean electricity or heat.

MUNICIPALITIES (CITY OF VANCOUVER) WILL:

3.2.1 Recover landfill gas from Vancouver Landfill and strive to maximize the beneficial use of the recovered gas. *Ongoing*

Strategy 3.3: Utilize non-recyclable material as fuel

Some materials cannot be recycled. However, such materials can provide a valuable source of fuel, replacing virgin fossil fuels.

METRO VANCOUVER WILL:

3.3.1 Direct recoverable loads of combustible material received at transfer stations to public or private energy recovery facilities *2012*

3.3.2 Ban wood from landfill disposal.*2012*

MUNICIPALITIES (CITY OF VANCOUVER) WILL:

3.3.3 Collaborate with Metro Vancouver in ensuring actions 3.3.1 and 3.3.2 are carried out at solid waste management facilities operated by the City of Vancouver. *2012*

ACTIONS REQUESTED OF OTHER GOVERNMENTS AND AGENCIES:

3.3.4 Provincial Government to develop material and energy requirements for existing and future stewardship programs to use the non-recyclable portion of returned material as fuel rather than landfilling. *2012*

Goal 4: Dispose of All Remaining Waste in Landfill, after Material Recycling and Energy Recovery

Strategy 4.1: Utilize the Vancouver Landfill as a disposal site

Waste will remain after recycling and energy recovery. Additionally, as a result of ensuring that waste-to-energy facilities are sized to be compatible with waste reduction and diversion objectives, there will be residual (post recycling) waste flows which exceed the aggregate capacity of the region's waste-to-energy facilities. Such waste must be disposed of in an environmentally sound and economically efficient manner. The Vancouver Landfill provides a local solution for remaining waste.

METRO VANCOUVER WILL:

4.1.1 Use the Vancouver Landfill to dispose of any remaining waste not directed to waste-to-energy facilities, subject to any fixed limits identified in the Operational Certificate of the landfill, related contracts, agreements between Vancouver, Delta, and Metro Vancouver and regulations. *Ongoing*

(a) Monitor the Vancouver Landfill to ensure compliance.

4.1.2 Report annually on the remaining capacity of the waste management system and prior to the closure of Vancouver Landfill, reassess the region's waste-to-energy and disposal options. *Ongoing*

MUNICIPALITIES (CITY OF VANCOUVER AND THE CORPORATION OF DELTA) WILL:

4.1.3 Work with Metro Vancouver to accommodate residual waste flows at the Vancouver Landfill subject to any fixed limits identified in the Operational Certificate of the landfill, related contracts, agreements and regulations. *Ongoing*

4.1.4 Where limits in the Operational Certificate, contracts, agreements and regulations appear to work contrary to the overall interests of the regional community, review the particular provisions in good faith with the Province, Metro Vancouver and any other involved party to determine if there is a solution acceptable to all affected parties. *Ongoing*

Strategy 4.2: Ensure a disposal site is available for DLC waste

Notwithstanding efforts to increase recycling, local public and private disposal sites for DLC waste are expected to reach their capacity in the near future. Collaboration with local and out-of-region stakeholders is necessary to anticipate DLC waste flows and identify future disposal sites.

METRO VANCOUVER WILL:

4.2.1 Assess long-term disposal of demolition, landclearing, and construction (DLC) waste remaining after recycling in collaboration with the private sector, neighbouring regional districts and First Nations communities. *Ongoing*

4.2.2 Identify disposal sites for DLC waste remaining after recycling that will be available when existing disposal facilities reach their capacity. *Ongoing*

Strategy 4.3: Establish contingency disposal sites

During the implementation of, or, following the implementation of Goal 3, if waste-to-energy capacity and/or local landfill capacity do not provide adequate disposal capacity, Metro Vancouver will need to use out-of-region landfill(s) for disposing of non-recyclable waste.

METRO VANCOUVER WILL:

4.3.1 Ensure adequate landfill capacity for:

- non-combustible and non-recyclable material; and
- municipal solid waste in excess of waste-to-energy and in-region landfill capacity (including allowances for variability in waste flows and short term operational disruption), and non-recyclable ash.

Ongoing as required

4.3.2 If sufficient waste-to-energy or landfill capacity is not available in the Region, this plan explicitly permits Metro Vancouver to seek and utilize the best available out-of-region landfill(s) for the disposal of remaining waste, subject to that facility having appropriate permits, from the local permitting jurisdiction in which it is located, to accept such waste.

Ongoing as required

(a) Monitor contingency disposal site(s) for performance and compliance. *Ongoing*

Strategy 4.4: Use adaptive management to address evolving needs

A key feature of the plan is adaptive management—monitoring progress, identifying challenges, and finding solutions to overcome challenges. Through monitoring, assessment, and collaboration, Metro Vancouver and its members will continue to adapt and evolve their solid waste management operations and infrastructure and create more resilient and adaptable systems.

METRO VANCOUVER WILL:

4.4.1 In the event of circumstances such as an operational disruption or closure at a facility identified in the Plan, the region will be prepared to send surplus waste to an out-of–region landfill until sufficient processing or disposal capacity becomes available in the region. Permitted landfill(s) will be selected based on:

(a) ability to provide service on a short term or interim basis

(b) sustainability principles. *Ongoing*

4.4.2 Continue to assess the success of initiatives outlined in the Plan against the overall trends in waste generation and the performance of waste-to-energy facilities to determine the need for an emphasis of future resource allocations to the various strategies and actions. *Ongoing*

4.4.3 Continue to receive advice from the Waste Management Committee. *Ongoing*

4.4.4 In collaboration with municipalities, biennially produce a progress report on plan implementation for distribution to the Ministry of Environment that:

(a) summarizes progress from the previous two years on regional and municipal plan implementation, the status of performance measures, and relevant education and outreach programs.

(b) includes summaries and budget estimates for proposed Metro Vancouver and municipal ISWRMP implementation programs for the subsequent two calendar years.

Ongoing every two years

4.4.5 Will obtain public feedback on the report by making the report available through Metro Vancouver's website and by holding a special meeting of the Metro Vancouver Waste Management Committee to receive public comments and input on the report.

Ongoing every two years

4.4.6 In collaboration with members and the Ministry of Environment, undertake a comprehensive review and update of the plan on a five-year cycle.

Ongoing every five years

MUNICIPALITIES WILL:

4.4.7 Work with Metro Vancouver to give effect to 4.4.4, 4.4.5, and 4.4.6. *Ongoing*

Performance Measures

Metro Vancouver will develop a waste accounting system for the entire solid waste management system, identifying the quantities generated, recycled, composted, used for energy recovery, and disposed in landfill. Comparison of per capita disposal values will provide the most accurate assessment of progress of the plan.

The following performance measures will monitor progress in achieving the specific goals. Performance should be considered in the context of 2008 waste management data. Performance Measures for each goal are:

Goal 1: Minimize Waste Generation

- Waste generation per capita tracked year-over-year
- Waste generation per capita for residential and commercial waste tracked year-over-year
- Increase of product stewardship initiatives by senior governments to more than two initiatives every three years

Goal 2: Maximize Reuse, Recycling and Material Recovery

- Overall diversion rate tracked year-over-year
- Diversion rate per capita tracked year-over-year
- Tracking of material recycling tonnage

Goal 3: Recover Energy from the Waste Stream After Material Recycling

- Energy outputs from solid waste and its beneficial use tracked year-over-year
- Energy outputs recovered from materials that cannot be recycled through recycling efforts and stewardship programs
- Greenhouse gas production tracked year-over-year

Goal 4: Dispose of all Remaining Waste in Landfill, after Material Recycling and Energy Recovery

- Quantity of treated and untreated waste per capita going to landfill is tracked year-over-year

Financial Implications

Roles and Responsibilities

Solid waste management services are provided for the region collaboratively by Metro Vancouver, member municipalities, and the private sector. While the roles of each party may overlap, primary roles for recycling include: Metro Vancouver establishes policy for waste diversion initiatives, member municipalities implement recycling programs including collection within their municipalities, and the private sector provides collection services, manages material brokerage and physical recycling of materials including provision of infrastructure for recycling facilities.

Responsibilities for disposal of the remaining solid waste includes: Metro Vancouver establishes policy for waste disposal, and manages infrastructure and operations of transfer and disposal facilities; member municipalities manage solid waste collection services; and the private sector may provide services for collection, and operation of transfer and disposal facilities. The main exception to these roles is the ownership and operation of the Vancouver Transfer Station and Landfill by the City of Vancouver.

Cost of Solid Waste Management

Funding for material recycling is provided by residents and businesses through one of two mechanisms. Materials with no associated industry stewardship program, such as paper, are funded from businesses and residents to recycling collectors (municipalities, or private sector contractors) either through municipal taxes or through direct contracts with collectors. Materials covered by Extended Producer Responsibility programs, such as beverage containers, are typically funded through deposits paid by consumers to the industry association which then carries responsibility for collection and recycling of the materials.

As outlined in Table 1, within Metro Vancouver, net expenditures associated with recycling activities is currently estimated to be $190 million annually. This reflects the cost paid to contractors for collection, transportation, and processing of recyclable materials. Following implementation of actions within this Plan, regional recycling net expenditures are projected to increase by 42% to $270 million annually – an increase of $80 million each year. The increase in economic activity will result in a corresponding increase in the diversion rate from 55% to 70% - a 27% increase. The cost increase of 42% producing a 27% increase in recycling reflects diminishing returns with respect to recycling materials with lower value, or more expensive processes and infrastructure. This trend of diminishing returns is anticipated to continue as the 70% diversion target is approached since the remaining materials become more challenging and costly to recycle.

TABLE 1 REGIONAL WASTE MANAGEMENT – NET EXPENDITURES

	35 Year Net Cost ($ billion)	Annual Net Cost ($ million)	Per Capita Cost ($)
Total Current SWMP	$20	$550	$247
Total Proposed ISWRMP	$18	$490	$220
Difference	**($2)**	**($60)**	**($27)**
Current Recycling (55%)	$7	$190	$85
Proposed Recycling (70%)	$10	$270	$121
Difference	**$3**	**$80**	**$36**
Current Disposal	$13	$360	$162
Proposed Diposal	$8	$220	$99
Difference	**($5)**	**($140)**	**($63)**

Funding for management of the materials remaining after recycling is provided by residents and businesses to solid waste collectors (municipalities or private sector contractors) either through municipal taxes or through direct contracts with the private sector collectors.

Within Metro Vancouver, net expenditures associated with solid waste disposal are currently estimated to be $360 million annually. This reflects the cost for collection, transportation, and disposal of solid waste remaining after recycling. Following implementation of actions within this Plan, regional solid waste disposal net expenditures are projected to decrease by 39% to $220 million annually – a decrease of $140 million each year. This decrease is due to the reduction in waste quantities, and increased revenues from energy recovery through actions outlined in Goal 3 of the Plan.

The system costs for both recycling and disposal are also expressed in Table 1 on a per-capita basis. The per-capita cost for recycling will be higher than disposal, reflecting the greater quantities of recyclable materials. However, pricing will be established to ensure a financial incentive to encourage recycling and waste diversion.

The costs identified in Table 1 reflect expenditures based upon the actions identified in the Plan which includes additional waste-to-energy capacity provided within the region. Alternately, if waste-to-energy capacity is provided out-of-region, net costs are anticipated to increase by $1.5 billion dollars over 35 years, or, $43 million annually. Similarly, if out-of-region landfill capacity is pursued, net costs are anticipated to increase by $1.5 billion over the same time frame, or $43 million annually compared to the proposed plan. It is expected that the cost to export waste to the U.S. would be similar to those presented for out-of-region landfill.

While Table 1 identifies the net regional expenditures on waste management, it does not account for the regional economy associated with recycling and disposal. There is considerable economic activity that takes place in the process of recycling the collected materials into new goods as an alternative to virgin feedstocks. Although difficult to estimate, the economy associated with remanufacturing recycled materials into new products exceeds the costs for collection, transportation and processing. Net expenditures associated with disposal more closely reflect the entire disposal economy since there is little economic activity that occurs following disposal. While this Plan places much greater emphasis on

waste reduction and recycling, and shifts regional net expenditures in alignment with this emphasis, there is an even greater shift in the overall regional economy from disposal to waste reduction and recycling. As a result, the regional economy for waste reduction and recycling far exceeds that for waste disposal and therefore is reflective of the priority placed upon waste reduction, reuse and recycling as outlined in this plan.

Pricing Strategies

The costs of operating the integrated solid waste and resource recovery system, including initiatives to encourage waste reduction, reuse and recycling, will be funded from revenues from users of the system (principally the tipping fee) and from revenues from recovered resources (recycled materials and recovered energy).

Residents and businesses will have an economic incentive to invest in waste diversion initiatives, arising primarily from the difference between the cost of recycling and the tipping fee for waste disposal at public facilities. The regional tipping fee will continue to be set at a rate to recover Metro Vancouver's cost to manage the solid waste system. The tipping fee for many recyclable materials will be reduced or waived at regional facilities to encourage participation. By utilizing this economic incentive of reducing or waiving the tipping fee for recyclable materials, positive behaviour will be encouraged thereby driving an increase in the material diverted from the disposal stream and helping to achieve the 70 percent diversion target. Pricing will be established so that the most expensive choice for residents and businesses will be to place materials in garbage cans and dumpsters for disposal.

Ownership and Financing

There are options to be considered for facility ownership and the related business model for all new facilities contemplated in this Plan. Currently, the existing waste-to-energy facility in Burnaby is owned by Metro Vancouver and operated by a contractor under a long-term operating agreement. The benefits of facility ownership include the accrual to Metro Vancouver of debt reduction once debt has been fully serviced, full control of all upgrades associated with the facility, no need for put-or-pay contracts, the ability to fully maximize revenues to offset costs, the control of all indirect costs including royalty payments, the control and negotiation of all operating certificates and the ability to further minimize cost by not requiring a profit margin. The consideration of the benefits of ownership was paramount when the decision was made in 2000 by the Board to purchase the Ashcroft Ranch and pursue the development of a Metro Vancouver owned landfill. In selecting the ownership and business model for new facilities Metro Vancouver will choose the option that results in the best available financial position for the residents and businesses of the region.

Where capital needs to be raised and debt financed, the least expensive alternative is Metro Vancouver ownership with financing provided through the Municipal Finance Authority. In addition to this financing structure, Metro Vancouver will explore other structures including Public Private Partnerships (3P) on a facility specific basis, where capital financing may be provided by the private sector partner.

As the outcomes of this plan contribute to the achievement of provincial and federal environmental and energy goals, and as regional and municipal financial resources are limited, and as public investment in the actions set out in this plan will assist in achieving the goals of this plan and are in the public interest, financial support from provincial and federal sources will be sought to implement waste diversion programs and develop facilities identified in the Plan.

Financial Details

Direct expenditures by Metro Vancouver and member municipalities for Goals 1 and 2 of the draft Plan are estimated to cost $170 million in one-time capital costs, and $40 million in annual operating costs. Significant initiatives provided through these expenditures (action number provided for reference) include: establish and progressively expand a network of eco-centres (2.2.4); divert organics from the waste stream through separated collection from residential and industrial, commercial and institutional sectors, and establishing one or more organics processing facilities (2.6.2, 2.6.3); provide information and education including social marketing programs (1.2.1, 1.3.1, 1.3.2, 1.3.3, 2.2.2, 2.2.5, 2.2.6, 2.2.7, 2.4.1, 2.5.2, 2.5.3, 2.6.2, 2.6.3, 2.7.1); regionally mandate DLC recycling at jobsites (2.4.5); and regionally mandate recycling in all multi-family and commercial buildings (2.8.1, 2.8.2).

Expenditures for actions identified in Goals 1 and 2 will be funded through tipping fees received for waste disposal and from revenues associated with actions. For example, expenditures for eco-centres will be partially offset by compensation from industry stewards for EPR material collection at the eco-centres and from private sector partners operating at eco-centres. Revenue from compost or energy sales at organics processing facilities will offset the costs associated with operating these proposed facilities.

Direct expenditures by Metro Vancouver and member municipalities for Goals 3 and 4 of the draft Plan are dependent upon the financing and ownership structure for new facilities. If new disposal facilities are provided by and owned by Metro Vancouver, costs for Goals 3 and 4 are estimated to be $440 million in one-time capital costs. Annual operating costs are projected to be approximately $15 million lower than current costs. Under this financing and ownership structure, tipping fees for waste disposal will increase initially during the 15 year amortization period. Following debt retirement, tipping fees will decrease considerably reflecting the net revenue from new waste-to-energy capacity and no debt repayment costs. Over a 30 year operating period, total revenues for new waste-to-energy facilities are projected to exceed the total expenditures resulting in a net revenue. Profit will continue to increase each subsequent year as revenues are accrued in the absence of any capital repayment costs. This is favourable over a 30 year operating period when compared to a $3.1 billion expenditure for an option emphasizing mechanical-biological-treatment processing or a $1.5 billion expenditure for an option emphasizing landfilling.

Provision of waste-to-energy capacity is estimated on the basis of a single new facility providing 500,000 tonnes capacity annually. Distributed systems of waste-to-energy using several smaller facilities will provide social and environmental benefits in the form of additional facilities and the corresponding increased convenience to customers, and reduced emissions and congestion from transportation of waste from regional transfer stations. Financially, a distributed system would reduce the need for transfer stations and associated costs, but would also reduce economies of scale provided by a larger capacity facility and result in higher costs.

If new waste-to-energy facilities are owned and financed by the private sector, costs for Goals 3 and 4 may be recovered over a longer time frame and the regional tipping fees could increase gradually over time due to inflated contract costs. Over a 30 year operating period, privately owned facilities could cost hundreds of millions of dollars more than public ownership if increasing energy revenues accrue to the operator. Accordingly, Metro Vancouver will pursue the ownership and financing model that is in the best interest of member municipalities, residents, and businesses within the region.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RTS 8751
ATTACHMENT 2

Fact Sheet on Metro Vancouver's Efforts to Replace the Cache Creek Landfill

metrovancouver Greater Vancouver Regional District · Greater Vancouver Water District
Greater Vancouver Sewerage and Drainage District · Metro Vancouver Housing Corporation
4330 Kingsway, Burnaby, BC, Canada V5H 4G8 604-432-6200 www.metrovancouver.org

February 25, 2010

Fact Sheet of Metro Vancouver's Efforts to Replace the Cache Creek Landfill

The following fact sheet lists Metro Vancouver's efforts to date to replace the Cache Creek Landfill, projected to reach its capacity in 2010, as requested by the GVS&DD Board on January 15, 2010.

1985 Metro Vancouver's first regional Solid Waste Management Plan (SWMP) is approved by the BC Ministry of Environment. The SWMP is widely supported by the GVS&DD Board, the Province and the public.

1989 Wastech Services Ltd. (Wastech) is successful in establishing the Cache Creek Landfill (CCLF). A minimum of 200,000 tonnes per year of municipal solid waste (MSW) is guaranteed to ensure economic feasibility.

1992-1995 In developing the Region's second SWMP, the following alternatives to the CCLF landfill are considered:

Option 1: Build new in-Region waste-to-energy (WTE) facility(s)
Option 2: Build a new in-Region landfill
Option 3: Expand the CCLF
Option 4: Disposal at Vancouver Landfill (VLF) and Burnaby WTE facility
Option 5: Close VLF after 1999 and build WTE(s) when CCLF is full
Option 6: Close VLF after 1999 and expand the CCLF as needed

The evaluation criteria indicate waste minimization, cost, and environmental and social considerations. Option 3 - *Expand the CCLF* is deemed to be the preferred option.

1995 The SWMP is approved by the GVS&DD Board in July 1995 and by the BC Minister of Environment in November 1995.

1995-1998 SWMP implementations are carried out, with emphasis on 3Rs initiatives.

1998-1999 Expansion of the CCLF is pursued, but difficulties are encountered with respect to First Nation interests.

2000 Public announcement is made on the Metro Vancouver purchase of the Ashcroft Ranch, with the intent to site a landfill on the property.

2001 Initial consultation is held with key stakeholders, including First Nations. Thompson-Nicola Regional District approves a boundary expansion for the Village of Ashcroft, to include the Ashcroft Ranch within the Village.

2002-2003 Communications and consultation program for the Ashcroft Landfill Project begins and a consultant is hired to commence technical studies. The GVS&DD Board approves an additional expenditure for the environmental assessment (EA) work as per recommendation from the Province. Processes and timelines are agreed upon by the MOE and the Environmental Assessment Office (EAO). The EAO declares the Ashcroft Ranch Landfill Project a reviewable project.

2004 Metro Vancouver submits the Ashcroft Landfill Project EA application to the EAO for review. Concurrent consultation on the EA application and the SWMP amendment is carried out by Metro Vancouver. Application for amendment of the 1995 SWMP is filed with the Province.

2005 BC EAO completes a public review of the EA application in February and reports to ministers. Ministers have 45 days in which to make a decision. Provincial ministers subsequently delay their decision three times and upon the third delay in April the EAO is instructed to investigate the issue of a composite landfill liner.

In June, the Province suspends the Ashcroft Landfill Project EA process and directs an investigation of alternatives that would enable Metro Vancouver to call for non-binding expressions of interest, which would then be subject to an inclusive and transparent evaluation leading to a recommendation for the GVS&DD Board to consider. All submissions received would be made public and the Ashcroft Landfill proposal would be a part of this process.

2006 Metro Vancouver establishes an Advisory Panel to oversee the process with three members appointed by: 1) Metro Vancouver, 2) First Nations Leadership Council and 3) UBCM. Metro Vancouver issues a Request for Expression of Interest (RFEOI) seeking firms to submit facilities or processes to provide solid waste disposal to replace the CCLF. A total of 23 submissions are received in response. Amongst the 23 submissions is Metro Vancouver's Ashcroft Landfill Project. Dillon Consulting Ltd. (Dillon) is appointed as the Independent Evaluator tasked with reviewing the submissions to the RFEOI, preparing a short-list and leading community and First Nations consultation on that short-list.

Wastech advises Metro Vancouver that its parent company, Belkorp Industries Inc. (Belkorp) is working with the Bonaparte Indian Band on an agreement intended to allow for an extension to the CCLF. Metro Vancouver suggests to Wastech that their proposal to extend CCLF be submitted under the RFEOI process, but Wastech declined, relying instead on their rights and obligations under the Comprehensive Agreement.

2007 Dillon advises Metro Vancouver of their concerns that no in-Province replacement will be available upon closure of the CCLF. They recommended that Metro Vancouver identify a short-term contingency for the period between the closure of the CCLF and the opening of a new long-term facility. A possible solution is identified in the form of the "Annex", a

small scale extension to the current CCLF that is being pursued by Wastech to provide more capacity and more time (one to two years). Dillon also suggests that Metro Vancouver consider a more detailed Request for Proposal (RFP) to allow proponents the opportunity to further develop their proposals.

REAC submits its report on the technical review of the expressions of interest to Dillion. Their report ranks the short-list of submissions as follows: Ashcroft Landfill Project, Highland Valley Copper, Rabanco, Montenay, and Green Island Energy.

Dillon short-lists three proponents (Ashcroft Landfill Project, Highland Valley Copper and Rabanco) for final analysis and community consultation. Three others (CCS Landfill in Fort St. John, Cache Creek Extension proposed by Belkorp Industries Inc., Beaver Regional Landfill in Ryley, Alberta) were unprepared to adhere to the Independent Evaluators requirements / schedule.

Justice Douglas Lambert, appointee of First Nations Leadership Council, advises Metro Vancouver that the Nlaka'pamux Nation Tribal Council (NNTC) is adamantly opposed to the proposed interior landfills. Metro Vancouver elected officials met with provincial ministers who confirmed that it would be difficult for a project to succeed without the support of First Nations.

2008

In January, the Metro Vancouver Board resolves to abandon plans to continue landfilling in the Interior of BC and instead focus its efforts on the Zero Waste Challenge and establishment of local composting and waste-to-energy facilities. Use of Vancouver Landfill and/or export to the United States is proposed as an interim strategy for waste disposal.

As directed by the GVS&DD Board, Metro Vancouver retains the services of AECOM Canada Ltd. (AECOM) to complete an independent comparative analysis of options for management of waste after recycling. Eight integrated waste management scenarios using different configurations of three technologies, in combination with existing waste management facilities are compared:

Option 1:	Build large (750,000 t/yr) in-Region WTE facility
Option 2:	Build moderate (500,000 t/yr) in-Region WTE facility
Option 3:	Build in-Region mechanical biological treatment (MBT) facility (500,000 t/yr) with in-Region use of refuse derived fuel (RDF)
Option 4:	Build in-Region MBT facility (500,000 t/yr) with out-of-Region use of RDF
Option 5:	Build moderate (500,000 tonnes/yr) out-of-Region WTE facility
Option 6:	Build in-Region MBT facility to stabilize all MSW for disposal at the Vancouver Landfill
Option 7:	Vancouver Landfill accepts 750,000 t/yr of MSW and balance is sent to new out-of-Region bioreactor landfill

Option 8: Vancouver Landfill accepts 230,000 t/yr of MSW and balance is sent to new out-of-Region bioreactor landfill

2009 Zero Waste Challenge goals, strategies and actions are developed by Metro Vancouver in close coordination with REAC. Public consultation is conducted in April which resulted in the Metro Vancouver Board adopting a 70% diversion target to be achieved by the year 2015.

Following aggressive waste reduction, Metro Vancouver staff recommends a shift to more in-Region WTE capacity in combination with existing waste management facilities as the preferred option for disposal of the remaining 30% of waste based on environmental, social and financial analysis completed in the AECOM study. Metro Vancouver presents the results of the study to the GVS&DD Board and to the public through a Council of Councils, presentations to various municipalities and the Fraser Valley Regional District, and through a series of public forums. A draft of the Region's third SWMP is presented with a recommendation to proceed to public consultation.

The Annex to the Cache Creek Landfill is approved by the Ministry of Environment extending the closure date from 2010 to 2012. The approval is subject to four separate environmental appeals. Appeals are not scheduled to be heard until May, 2010.

Metro Vancouver's application to amend the existing SWMP to allow for export of waste to the United States in denied by the Ministry of Environment.

2010 The BC Minister of Environment approves the Cache Creek Landfill Environmental Assessment application and grants the project an EA certificate.

Metro Vancouver meets with affected First Nations and the Fraser Valley Regional District to discuss form of consultation prior to making any decisions on the draft SWMP.

RTS 8751
ATTACHMENT 3

Correspondence between City and Metro Vancouver on Solid Waste Management Plan

metrovancouver

4330 Kingsway, Burnaby, BC, Canada V5H 4G8 604-432-6200 www.metrovancouver.org

Policy and Planning Department
Tel. 604-436-6815 Fax 604-436-6970

June 8, 2010

File: CP-16-01-SW2-005

Mr. Peter Judd, P.Eng.
Acting General Manager, Engineering Services
City of Vancouver
320 – 507 W Broadway
Vancouver, BC V5Z 0B4

Dear Peter:

Re: Response to Vancouver's May 17 and 25 Letters Requesting Further Information on ISWRMP

Please find attached the response to the queries from your May 17 and 25, 2010 letters.

We appreciate your questions and hope the response clarifies your concerns and will assist you in reporting to your Council.

If you require any additional information, please contact Fred Nenninger at 604-432-6478.

Yours truly,

Toivo Allas
Manager, Policy and Planning

TA/DR/jmb

Attachment: City of Vancouver Questions and Requested Additional Information on the Draft Integrated Solid Waste Resource and Management Plan

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City of Vancouver Questions and Requested Additional Information on the Draft Integrated Solid Waste Resource and Management Plan

The following answers are provided in response to questions posed by the City of Vancouver in their letters dated May 17 and 25, 2010.

Waste Statistics and Performance Metrics

1. Recycling data from 2009 has not been received from all municipalities therefore it has not been compiled and is unavailable at this time. As noted in the May 25 letter, the 2008 information is available in the *Recycling and Solid Waste Management 2008 Report*. This is the most recent data available. In addition, appendix 2d of the *Zero Waste Challenge Goals Strategies and Actions* document released in 2009 provides a more detailed breakdown of waste composition for the multi-family and self-haul sectors. These two reports are available at the following locations:

http://www.metrovancouver.org/about/publications/Publications/2008_Solid_Waste_Management_Annual_Summary.pdf
http://www.metrovancouver.org/about/publications/Publications/ZWCManagementPlanMarch2009.pdf

2.a) Approximately 90,000 tonnes was disposed at licensed disposal facilities. Approximately 30,000 tonnes was exported to facilities outside the region by licensed private transfer stations.
An unknown and unrecorded quantity of DLC waste, primarily from single family home demolitions, was exported directly to facilities outside the region.

2.b) The draft plan includes actions to implement wood disposal bans and pricing strategies. Specific details on how to provide for DLC disposal capacity including incentivizing will be addressed in the implementation of the plan. Strategy 4.2 of the draft plan and associated actions focuses on ensuring DLC disposal capacity is available.

3.a) The quantities of various recyclable materials in the waste stream was estimated using waste composition study data, which involved manual separation of the waste components. Each of the materials was examined with respect to the success of existing programs and the likelihood of success of proposed future programs. Consideration was given to participation rates, ease of separation of material, effect of future EPR programs and success in other jurisdictions. A conservative realistic estimate of possible diversion was made for each material.

3.b) Two significant limiting factors are the nature of the materials (contamination, combination materials, markets for recycled materials, ease of separation) and the degree of participation of the public and businesses. If 70% of the people recycle at 70% effectiveness the overall recycling rate would only be 50%.

3.c) Significant measures such as organics processing and eco-centres have been proposed and will require significant resources to implement. The minimum 70% diversion target is considered an aggressive but realistic goal. Looking at other similar sized jurisdictions around the world, few, if any are reporting diversion rates above 70%.

The actions identified in the plan include all reasonable initiatives within the direct control of Metro Vancouver and member municipalities. Progress beyond 70% diversion is expected, but actual progress beyond 70% will depend upon how and when the limiting factors identified in 3b above are addressed. Changing product design and manufacturing methods on an international scale to facilitate increased recycling, and modified social behaviour in order to ensure high rates of participation and diligence in recycling, will take time and effort to realize measurable results. The draft plan identifies the actions to initiate this change. Timeframe and success of diversion beyond 70% are unknown as there are few examples of similar jurisdictions that have achieved this result.

4.a) Solid waste performance metrics among different jurisdictions are often not directly comparable. Different jurisdictions include or exclude different sectors and different materials, particularly when looking at generation and diversion quantities. The comparison between Metro Vancouver and the Canadian average is:

	Metro Vancouver (2008)	Canada Average (2006)
Disposal (tonnes/capita)	.66	.84
Diverted (tonnes/capita)	.82	.24
Generated (tonnes/capita)	1.48	1.08

One significant difference in these figures is Metro Vancouver includes concrete and asphalt recycling (650,000 tonnes in 2008 or 0.28 tonnes/capita) as diversion while the Canada Average does not.

4.b) Metro Vancouver considers the per capita disposal rate as one of the most important metric available. As such, it will be tracked as a performance measure as identified in the draft plan. It should also be noted, that disposal rates vary in direct proportion to the economy therefore variations in the disposal rates will occur that are beyond the control of Metro Vancouver or member municipalities. When establishing performance measures we must distinguish between key metrics to monitor performance, and metrics that will be used for regulatory compliance. While the diversion rate may not be as good an indicator of performance as per capita disposal, it is one which Metro Vancouver and member municipalities have greater ability to influence and control. In the absence of the Province establishing waste reduction targets as they have done previously, the diversion rate has been selected as the most appropriate metric to gauge regulatory compliance.
The Ministry of Environment is currently developing a province wide standard for measurement of waste parameters to which Metro Vancouver is providing input. There may be an opportunity to align performance measures identified in the plan with the provincial standard.

5. Until there is some refinement in the measurement of waste quantities from ICI and MF-residential waste sources, we are better to report on the aggregate amounts. ICI and MF waste is collected by the same trucks and cannot be segregated at the weigh scales. Metro will be monitoring each sector in order to assess program successes and to identify new program possibilities.

Waste Diversion – Specific Materials

6.a) The proposed amendment by the City of Vancouver to ban wood waste could be an effective diversion strategy to help reach our reduction goals. However, such a ban could only apply to clean wood as painted and treated wood are not currently compostable. For painted or treated wood, energy recovery remains the preferred management option as addressed in Strategy 3.3 of the plan, similar to the current practice of DLC wood recyclers in the region.

6.b) A region wide ban on organics as suggested by Vancouver is another effective diversion strategy and is consistent with Metro Vancouver's commitments to implement additional material bans once sufficient education and infrastructure are in place. Such a ban may be limited to compostable organics which would not include materials such as natural rubber, leather or textiles which currently represent 3% of the disposed waste stream. Timing for implementation of such a ban will be dependant upon success in overcoming barriers in the multi-family and IC&I sectors.

6.c) The Environmental Management Act provides enabling authority for Metro Vancouver to restrict the materials disposed in private landfills. The current Solid Waste Regulatory Bylaw does not provide the authority to do this. Again, there would have to be reasonable alternatives to disposal in place before engaging these restrictions could be considered.

Energy Recovery from Waste after Recycling

7. The draft plan establishes a preference to recover materials and energy prior to disposal in a landfill. It does not select any technologies to achieve recovery since this is best done through a competitive process which can only be conducted after plan direction is confirmed. While there is no preference in the plan towards any specific technology, it is clear that the most common and successfully utilized technology is mass burn incineration. Mass burn incineration was selected in the analysis by AECOM as the baseline waste-to-energy technology for their comparison of alternatives. Mass burn was selected for the comparison since it is an established technology with numerous operational plants throughout the world to sufficiently understand operational performance, capital and operating costs, and environmental impacts.

   a) Redefining waste-to-energy in the plan to exclude mass burn incineration may add significant risk to the successful implementation of the plan. Conversion technologies are emerging and have shown potential but are not sufficiently developed and reliable in mainstream, full scale commercial operation to process mixed municipal solid waste (as is the case with Plasco's project in Ottawa). Technologies exist to treat source separated or mechanically separated fractions of the waste stream.

      It is preferable to be inclusive in the plan to all waste-to-energy technologies, conduct a competitive process and then compare firm performance, reliability and cost of proposed facilities through a binding process. The selection criteria as outlined in the plan include maximum environmental, financial and social performance, and alignment with sustainability principles.

b) A decision to proceed with an emerging technology will introduce significant risk with respect to uncertain costs and operational performance. Selection (or elimination) of technologies in the absence of a competitive and binding process could result in pursuit of technologies that are not capable of delivering as claimed. Risk of proceeding with emerging technologies would have to be shared equitably by all municipal members regardless of where any individual municipality's waste is disposed.

Residuals Management

8. Based on requests from the City of Vancouver in 2009, the language in Section 3.2.1 was revised from firm landfill gas capture targets to the current language which does not have any commitments. The current language appears to be consistent with the City's plans for the landfill, the operational certificate for the landfill, and the new provincial landfill gas regulations.

   There have been requests to include operational criteria for the landfill in the plan similar to what has been established for the existing and new waste-to-energy facilities in Goal 3. Action 4.1.1(a) "monitor to ensure compliance" is not intended to be in a regulatory capacity. This action will be reviewed from a legal perspective to ensure regulatory capacity is not implied.

   While Metro Vancouver is not the regulatory agency for the landfill (liquid waste and air discharge excluded), Metro is responsible for regional waste management and rely upon the Vancouver Landfill for a portion of the regional disposal capacity. As such, there is an obligation to monitor all facilities to ensure they remain reliable operating facilities within the plan. In order to ensure provision of regional disposal capacity Metro needs to ensure ongoing performance of all facilities and need to be aware of issues that may compromise regional capacity including compliance and operational issues.

9. Timeline for waste-to-energy capacity
   a) There is no certainty for the timeline of new waste-to-energy facilities. Proponents such as Green Island Energy have indicated timeframes as short at two years, others have indicated as little as three years. While these timelines may be theoretically possible, the uncertainty lies in the timeframe to site a facility including assessments, approvals and consultation activities. Since these activities are very site and project specific, comparison to other projects in North America, or anywhere in the world, may not be appropriate. Five years is considered realistic to site and obtain regulatory approvals, design and construct a facility.
   b) Contingencies if additional waste-to-energy capacity is not provided in time for the closure of the Cache Creek Landfill are to use other landfills with available capacity on an interim basis. These include both existing and proposed landfills within and outside of the province.
   c) Bridging options include reducing waste disposal to the Cache Creek Landfill to extend its life, and use of other existing landfills on an interim basis. Expected costs associated with bridging options will be finalised when these options are exercised under an approved new Plan.

Financial Implications

10. Reduction in net disposal expenditures
    a) The decrease in annual net expenditures of $140 million is the result of modeling all disposal costs including projected capital and operating costs of all facilities, projected revenues, and changes in waste quantities due to diversion and growth. This is an average over the 35 year modeling timeframe from 2010 to 2045. The primary cost drivers are waste quantities and additional revenues. Reduced quantity (increased diversion and less growth of waste generation) accounts for approximately $70 million reduction in costs. New waste-to-energy revenue will vary from $45 million in 2015, to $110 million in 2045.
    b) Savings from reduced waste quantities were treated as variable costs.

11. Costs of disposal and recycling
    a) With increased revenue from waste-to-energy and long term net profit from a new waste-to-energy facility there will be lower operating costs for disposal facilities. If the tipping fee is maintained, any surplus resulting in disposal costs being lower than the tipping fee could be applied to subsidize recycling if and when required.
    b) If an economically efficient disposal system is established the actual cost for disposal should decrease and reduce the risk of leakage out of the system. If tipping fees are increased in the short term to cover capital expenditures then the risk of waste leaving the region will increase.
    c) In the event this leakage is significant there are several mechanisms that can be utilized to control it. These include implementation of a split fee system, hauler licensing and franchising of collection.
    The split fee system was included as an amendment to the GVS&DD Act on June 21, 1995. Section 7B of the Act provides the regulatory framework to enable this system. Details of the how the split fee system would function are outlined on page 18 of the 1995 Solid Waste Management Plan. A draft by-law was developed to be implemented if and when necessary, but has not been formally adapted by the Board. A copy of this draft by-law is attached.

    The GVS&DD Act and 1995 SWMP may be found at:
    http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/00_58059_01
    http://www.metrovancouver.org/about/publications/Publications/SolidWasteManagementPlan1995.pdf

12. Eco-Centres
    a) Development of eco-centres is projected to divert approximately 150,000 tonnes per year. This is a high level planning estimate dependant upon location, size, and materials collected. Note that EPR material collection and funding is subject to future negotiations with industry stewardship associations and all eco-centres may not collect all materials.
    b) Eco-centres will generate revenue from recyclable materials although this revenue stream is variable. Funding will also be provided from industry stewards who will contribute funding for facility hosting and collection of materials under their responsibility. Revenue may also be generated from tipping fees for residential waste drop-off facilities which may be integrated into the eco-centre. A detailed breakdown of revenues is not currently available.
    c) Funding for Eco-centres is anticipated to be by Metro Vancouver and partially offset by lower capital and operating expenditures for transfer stations. Municipal

expenditures on existing recycling depots may decrease but would be offset by greater municipal contributions through disposal tipping fees or other mechanisms.

13. The types of alternative funding mechanisms indicated are not being contemplated at this time.

14. 35 year net cost for disposal
    a) The underlying assumptions made in the AECOM report are identified on page 182 of their report and include:
        - 75% landfill gas capture rate
        - 70% of input energy in WTE is converted to district energy
        - 90% of district energy heat output is sold
        - District energy uptake starts at 50% and increases 5%/year to 90% max
        - Electricity rate: $100/MWh – 0.0% inflation
        - Natural Gas rate: $6/GJ – 1.0% inflation
        - District Heat sold at 75% of natural gas rate
        - Inflation on transportation: 0.3%
        - Discount rate: 5.0%

    b) There are risks inherent in financial forecasts. Sensitivity analyses were conducted for many variables that may fluctuate. The risks are inherent in all scenarios with no greater risk for waste-to-energy than for other scenarios. Risk will be mitigated by conducting competitive processes and only proceeding with projects that have acceptable risks.
    c) Risk may also be mitigated through agreements with private sector partnerships, but in return for risk transfer there is typically an offsetting benefit that is also transferred to the private partner. Such mitigation options will be evaluated on a case specific basis through a competitive process.

15. Waste generation and composition vary over the 35 year financial modelling period. A typical year was assumed and utilized for the 35 year period.

    Waste quantities will reduce as the diversion rate approached 70% but due to diminishing returns, increases in the diversion rate will occur at a slower rate. Further gains in waste reduction will be offset by population growth resulting in relatively consistent waste quantities. On this basis, disposal quantities were fixed at 1,260,000 for the course of the modelling period.

    Waste composition was projected following implementation of all proposed actions in the plan. The future waste composition when 70% is achieved was used as a basis for the financial modeling. It is expected that EPR programs will continue to make gains in removing plastics and other materials from the waste stream, but also that organics will also decrease. The net effect of removal of more plastics and organics is that the proportional composition will not change significantly once 70% diversion is surpassed. Therefore the waste composition at 70% diversion was used for the duration of the financial model.

GREATER VANCOUVER SEWERAGE AND DRAINAGE DISTRICT

SOLID WASTE GENERATION LEVY BY-LAW NO. •

WHEREAS:

A. Greater Vancouver Sewerage and Drainage District is a corporation incorporated under the *Greater Vancouver Sewerage and Drainage District Act* with objects that include the disposal of all types of waste in substantial accordance with a report of the board of engineers composed of M.J.J. Dayton, R.M. Martin, F.R. Bunnell, dated the thirteenth day of June, 1973, a copy of which has been filed in the office of the Provincial Secretary and which, for the purpose of identification, has been signed by F.R. Bunnell, commissioner of the Greater Vancouver Sewerage and Drainage District (the "Bunnell Report"), and the purchase, construction, operation, maintenance, and administration of facilities for the disposal for all types of waste;

B. Section 7B of the *Greater Vancouver Sewerage and Drainage District Act* authorizes Greater Vancouver Sewerage and Drainage District to set levies payable by generators of waste or by other persons who use the services of a waste hauler based on the quantity, volume, type or composition of waste generated or on the fees charged by the applicable waste hauler for its services, which levies may vary in relation to classes of persons, operations, activities, industries, trades, businesses or wastes;

C. Greater Vancouver Sewerage and Drainage District began planning and operating a system for the disposal of solid waste generated in the area of Greater Vancouver Sewerage and Drainage District in 1973, pursuant to the Bunnell Report and it has continued to carry out the functions of planning and disposal of solid waste generated within its area continuously since that date in substantial accordance with the Bunnell Report, as amended;

D. Greater Vancouver Sewerage and Drainage District currently carries out the functions of planning and disposal of solid waste generated within the area of its member municipalities and the City of Abbotsford, pursuant to the certain Solid Waste Management Plan dated July, 1995 (the "1995 Solid Waste Management Plan") and approved by the Minister of Environment, Lands and Parks for the Province of British Columbia;

E. Greater Vancouver Sewerage and Drainage District has made extensive capital investments in the solid waste disposal system referred to in recitals C and D above and in connection therewith, it has constructed and operates extensive waste handling and disposal facilities, in cooperation with certain of its member municipalities, pursuant to the 1995 Solid Waste Management Plan, providing for disposal of solid waste at landfill facilities at Burns Bog in Delta and at Cache Creek and at an incinerator in Burnaby; and

F. Greater Vancouver Sewerage and Drainage District wishes to establish a levy to be paid by generators of solid waste and persons who use the services of a waste hauler, to recover the

costs of all aspects of the handling of solid waste in its solid waste disposal system, exclusive of the costs attributable to the operations of the Burns Bog and Cache Creek landfill facilities.

NOW THEREFORE the administration board of the Greater Vancouver Sewerage and Drainage District in open meeting assembled duly enacts as follows:

PART 2
INTERPRETATION

2.1 Definitions:

(a)"Board" means the Administration Board of the District;

(b)"District" means Greater Vancouver Sewerage and Drainage District;

(c)"Estimated Annual Levy", for any Municipality, means the estimate of the aggregate annual Waste Generation Levy that will be payable by that Municipality in the following year, to be made by the Manager pursuant to Section 4.1;

(d)"Facilities" means the North Shore, Coquitlam, Langley, Matsqui and Vancouver Transfer Stations, the Burnaby solid waste incinerator and the Burns Bog and Cache Creek landfill facilities and "Facility" means any one of the foregoing facilities;

(e) "Manager" means the Manager, Solid Waste, of the District;

(f)"Municipal Waste" means all Waste collected by or on behalf of the Municipalities, whether by a Municipality's own employees or pursuant to a contract, agreement or other arrangement with a person who on a commercial basis picks up, transports or delivers waste, other than Waste collected by or on behalf of the City of Vancouver and the District of Delta;

(g)"Municipality" includes the member municipalities of the District including the City of Vancouver, and the City of Abbotsford;

(h)"Payment Notice" means a notice given by the Manager under Section 7.3

(i)"Regional Facilities" includes all the facilities except the Vancouver Facilities;

(j)"Registered Waste Hauler" means a Waste Hauler that [has established an account for payment of tipping fees with either Greater Vancouver Sewerage and Drainage District or the City of Vancouver providing for the tipping fees payable by the Waste Hauler to be invoiced and paid on a monthly basis];

(k)"Vancouver-Delta Waste" means all Waste that is picked up or collected by the City of Vancouver and the District of Delta;

(l)"Vancouver Facilities" means the Vancouver Transfer Station and the Burns Bog landfill facility;

(m)"Waste" means municipal solid waste as defined in the *Waste Management Act*, R.S.B.C. 1996, c. 482, as amended;

(n)"Waste Generation Levy" means the levy established by the Board under Section 2.1, and set out in Schedule A to this By-law;

(o)"Waste Hauler" means:

(i)a Municipality, that picks up, transports or delivers Waste, or

(ii)a person who, on a commercial basis, picks up, transports or delivers Waste;

(p)"Waste Producer" means any of the following persons:

(i)a person who generates Waste, including any Municipality that picks up, transports or delivers Municipal Waste or Vancouver-Delta Waste; and

(ii)a person who uses the services of a Waste Hauler within the area of any Municipality, including any Municipality that uses such services for the collection of Municipal Waste.

2.2 **Short Title.** This By-law may be cited for all purposes as "Greater Vancouver Sewerage and Drainage District Solid Waste Generation Levy By-law No. •, 1997".

2.3 **No Waiver.** Except as otherwise specifically provided, nothing in this By-law shall excuse any person from complying with any other applicable enactments and By-laws.

2.4 **Schedules.** Schedules A, B and C annexed to this By-law shall be deemed to be integral part of this By-law.

2.5 **Severability.** If any portion of this By-law is deemed *ultra vires*, illegal, invalid or unenforceable in any way in whole or in part by any court of competent jurisdiction, such decision shall not invalidate or void the remainder of this By-law, the parts so held to be *ultra vires*, illegal, invalid or unenforceable shall be deemed to have been stricken therefrom with the same force and effect as if such parts had never been included in this By-law or revised and reduced in scope so as to be valid and enforceable.

PART 3
WASTE GENERATION LEVIES

3.1 **Application of Waste Generation Levy.** Every Waste Producer must pay, under either Part 3 or Part 4 of this By-law, the applicable Waste Generation Levy set out in this By-law, at the times and in the manner prescribed in this By-law, to the District or to a Waste Hauler, as applicable.

3.2 **Calculation of Waste Generation Levy.** Waste Generation Levies imposed under this By-law will be calculated in accordance with the rates set out in Schedule A hereto.

PART 4
COLLECTION AND REMITTANCE OF NON-MUNICIPAL WASTE GENERATION LEVIES

4.1 **Collection of Waste Generation Levies.** Every Waste Hauler must collect the Waste Generation Levy imposed under this By-law from each Waste Producer from whom it picks up, transports, or delivers Waste, except for the Waste Generation Levies imposed on Municipalities for Municipal Work, as set out in Part 4, at the same time as the purchase price for the waste hauling services provided by the Waste Hauler is paid or payable, whichever is earlier. Every Waste Hauler is deemed to be an agent of the District for the purpose of collecting the Waste Generation Levy pursuant to this By-law.

4.2 **Levies Collected Held in Trust for District.** Every Waste Hauler must hold the monies collected by it pursuant to Section 3.1 in trust for the District in its capacity as agent for the District under Section 3.1. All amounts collected by a Waste Hauler in payment of the Waste Generation Levy shall be deemed to be held separate from and form no part of the Waste Hauler's money, assets or estate, whether or not the amounts collected in payment of the Waste Generation Levy have in fact been kept separate and apart from the money, assets or estate of such Waste Hauler.

4.3 **Remittance of Waste Generation Levy to District Generally.** The Waste Generation Levies applicable under this By-law must be remitted by every Waste Hauler or Waste Producer, as applicable, to the District in the case of Waste deposited at any Regional Facility, together with the certificate referred to in Section 3.5, as follows:

(a) in the case of Waste Generation Levies imposed on a Registered Waste Hauler, each Registered Waste Hauler must remit the applicable Waste Hauling Levies for each

month within [30 days] after the date of an assessment issued by the District to such Waste Hauler, in the amount set out in such assessment;

(b)in the case of Waste delivered by a Waste Producer or by an unregistered Waste Hauler to the District, the Waste Producer or Waste Hauler must remit the applicable Waste Hauling Levy at the time of delivery; and

(c)in the case of any Waste generated within the area of the Municipalities that is not included in any of subsections (a) and (b) above or Section 3.4, the applicable Waste Hauler or, if any such Waste is not being handled by a Waste Hauler, the applicable Waste Producer, must remit the applicable Waste Generation Levy no later than 30 days after the date of pick up, transportation or delivery of such Waste, together with a certificate of the Waste Hauler or Waste Producer that complies in all aspects with Section 3.5.

4.4 **Remittance of Waste Generation Levy to City of Vancouver.** The Waste Generation Levies set under this By-law in the case of Waste deposited at either of the Vancouver Facilities must be paid to the City of Vancouver, together with the certificate referred to in Section 3.5, as follows:

(a)in the case of Waste Generation Levies imposed on a Registered Waste Hauler, each Registered Waste Hauler must remit the applicable Waste Generation Levies for each month within [30 days] after the date of a certificate of assessment issued by the City of Vancouver to such Waste Hauler, in the amount set out in such certificate; and

(b)in the case of any Waste delivered by a Waste Producer or an unregistered Waste Hauler, the Waste Producer or Waste Hauler must remit the applicable Waste Generation Levy at the time of delivery.

4.5 **Assessment Certificates.** Every Waste Hauler (except a Municipality) must submit with or in respect of each remittance under either Sections 3.3 or 3.4, a certificate executed by a senior officer or director of the Waste Hauler, in the form set out in Schedule B hereto, certifying the aggregate quantity of Waste picked up by the Waste Hauler during the applicable period within the area of the Municipalities, excluding Municipal Waste, and setting out the names and addresses of all generators of such Waste. In addition, the Manager may require a Waste Hauler to provide any other information which may be used to calculate the Waste Generation Levy charged to and collected from Waste Producers and for which records are required to be maintained under Section 5.1.

4.6 **Remittance by City of Vancouver.** The City of Vancouver shall remit a portion of the Waste Generation Fee collected by it to Greater Vancouver Sewerage and Drainage District in accordance with the terms of that certain agreement dated • [maybe enter into a new splitting agreement to avoid publicizing Vancouver-Delta-GVS&DD agreement].

[4.7 Compensation. The District may in its sole and absolute discretion, provide compensation to Waste Haulers for their services in collecting and remitting the levy to the District as set out in Schedule B.]

PART 5
COLLECTION AND REMITTANCE OF MUNICIPAL WASTE GENERATION LEVIES

5.1 **Manager to Estimate Annual Municipal Waste Levies.** The Manager, at least 60 days before the end of each year, shall deliver to each Municipality, except those referred to in Section 4.3, an estimate of the Waste Generation Levy that will be payable by it in the following year (the "Estimated Annual Levy"). The determination of the Estimated Annual Levy shall be in the Manager's sole discretion, acting reasonably and will be based upon the Manager's estimate of the quantity of Municipal Waste that will be generated in such Municipality in the applicable year and the applicable rates for the Waste Generation Levy set out in Schedule A to this By-law.

5.2 **Municipality to Pay Estimated Annual Levy By Instalments.** Each Municipality must remit 1/12 of the Estimated Annual Levy no later than 30 days after the end of each month.

5.3 **Determination of Annual Quantity of Waste.** The Manager, no later than 90 days after the end of each year, shall deliver to each Municipality a determination of the actual annual quantity of Municipal Waste generated in such Municipality in the applicable year. If a Municipality has delivered all of its Municipal Waste to Facilities, the Manager's determination of the actual annual quantity of Municipal Waste shall be equal to the quantity of Municipal Waste delivered to the Facilities by such Municipality. Where any Municipality has not delivered all of its Municipal Waste facilities by such Municipality, the Manager shall determine the actual quantity of Municipal Waste generated by such Municipality by estimating the quantity of Municipal Waste generated by such Municipality, pursuant to Section 7.1 and in each such case Sections 7.2 and 7.3 shall apply.

5.4 **Adjustment of Waste Generation Levies.** If the Annual Levy paid by a Municipality exceeds the aggregate amount of Waste Generation Levies applicable to the actual annual quantity of Municipal Waste determined pursuant to Section 4.3, the District shall refund such overpayment to the Municipality. If the Annual Levy paid by a Municipality is less than the aggregate amount of Waste Generation Levies applicable to the actual annual quantity of Municipal Waste determined pursuant to Section 4.3, the Municipality shall pay the difference to the District. In either of the foregoing events, the District or the Municipality, as the case may be, shall pay the required amount to the other within thirty days after determination of the actual annual quantity of Municipal Waste by the Manager.

PART 6
RECORDS, INSPECTIONS AND AUDITS

6.1 **Records.** Every Waste Hauler (except a Municipality) must keep a record of:

(a)the quantity, volume and type of composition of Waste picked up by the Waste Hauler in the area of the Municipalities; and

(b)any other information which, in the opinion of the Manager reasonably exercised, may be necessary or desirable in order to calculate the Waste Generation Levies or to determine or verify the matters set out in (a); and

shall retain such records for a period of not less than 5 years from the date such records are created.

6.2 **Inspection and Audit Powers.** The Manager may appoint persons for the purposes of this Part 5.

6.3 **Entry to Business Premises.** Except as limited by Section 5.5, a person appointed by the Manager under Section 5.3 may enter during normal business hours the business premises occupied by a Waste Hauler, or the premises where the records of a Waste Hauler are kept, in order to:

(a)determine whether this By-law is being or has been complied with;

(b)inspect, audit and examine books of account or other records; or

(c)ascertain the quantities, volumes, types or composition of Waste picked up by the Waste Hauler, whether in aggregate or from any particular Waste Producer.

6.4 **Production of Records.** A person occupying premises referred to in Section 5.3 must produce all books of account or other records as may be required by a person appointed under Section 5.2 for the purposes of Section 5.3 **[and must answer all questions of that person regarding the matters referred to in Section 5.3] [Note: I would like to include this power, but our act does not specifically contemplate it. Consider whether the general powers in Section 7B pertaining to collections are sufficient to do this].**

6.5 **Restriction.** The power to enter a place under Section 5.3 must not be used to enter a dwelling occupied as a residence without the consent of the occupier.

[6.6 No Interference with Manager. A person must not:

(a)hinder, molest or interfere with a person appointed by the Manager doing anything that the person is authorized to do under this Part 5; or

(b)prevent or attempt to prevent a person appointed by the Manager from doing anything that the person is authorized to do under this Part 5.] [Note: I would like to include this power, but our act does not specifically contemplate it. Consider whether the general powers in Section 7B pertaining to collections are sufficient to do this]

PART 7
ASSESSMENTS OF REMITTANCES BY WASTE HAULERS AND WASTE PRODUCERS

7.1 **Assessment for Levy Owing.** If it appears that any amount in respect of Waste Generation Levies should have been but was not remitted by a Waste Hauler or Waste Producer, the Manager may assess the Waste Hauler or Waste Producer for the amount of the outstanding Waste Generation Levies.

7.2 **Manager Must Assess Levy in Certain Circumstances.** If it appears from an inspection, audit or examination of the books of account, records or documents that this By-law has not been complied with:

(a) the person making the inspection, audit or examination must calculate the amount of the Waste Generation Levies that are uncollected or due in a manner and form and by a procedure the Manager considers adequate and expedient; and

(b) the Manager must assess the person for the amount of the Waste Generation Levy so calculated.

7.3 **Limitation.** In making an assessment under this Part 6, the Manager must not consider or include a period greater than 5 years before the date of the first notice of assessment. Despite the foregoing, the Manager may consider and include any period in making an assessment under this Part 6, if the assessment relates to a contravention of this by-law that involves wilful default or fraud.

7.4 **Manager May Impose Penalty.** If it appears that any amount in respect of Waste Generation Levies should have been but was not collected by a Waste Hauler, the Manager must impose a penalty against the Waste Hauler who should have collected the Waste Hauling Levies consisting of both:

(a) the amount of the Waste Generation Levies that should have been collected; and

(b) interest at the rate prescribed by the Lieutenant Governor in Council under Section 115 of the *Social Service Tax Act.*

7.5 **Maximum Penalty.** In imposing a penalty under this Part 6, the Manager must not consider a period greater than 3 years.

PART 8
DETERMINATION OF LEVY BY MANAGER

8.1 **Estimate of Unpaid Levies.** If:

(a)a Waste Hauler or Waste Producer fails to make a remittance or payment or deliver a certificate under Section 3.5 or comply with any other requirement under this By-law;

(b)the matters certified by a person referred to in paragraph (a) are not substantiated by the person's records; or

(c)a Waste Hauler or a Waste Producer does not deliver all of its Waste to the Facilities;

then the Manager may make an estimate of the amount of the Waste Generation Levy collected by that person for which the person has not accounted.

8.2 **Effect of Estimate.** The amount estimated under Section 7.1 is deemed to be equal to the Waste Handling Levy collected by the person in relation to whom the estimate is made, and that person must pay the estimated amount to the District.

8.3 **Payment Notice.** The Manager may give written notice (a "Payment Notice") either by mailing to or service on:

(a)a Waste Hauler; or

(b)a Waste Producer,

requiring that the amount estimated under Section 7.1 be paid to the Manager or otherwise accounted for within 15 days from the date the Payment Notice is mailed or served.

8.4 **Considerations by Manager.** In making an estimate under this Section the Manager must not consider or include a period greater than 5 years before the date of the first Payment Notice. Despite the foregoing, the Manager may consider and include any period in making an estimate under this Part 7, if the estimate relates to a contravention of this By-law that involves wilful default or fraud.

8.5 **Payment Notice is Proof of Amount Owing.** Proof that a Payment Notice has been given under Section 7 constitutes evidence that the amount stated in the Payment Notice is due and owing, and the onus of proving otherwise is on the Waste Hauler or Waste Producer.

PART 9
OFFENCES

9.1 **Offence.** Any person who fails to collect or remit the Waste Generation Levy or to remit an assessment therefor as required by Parts 3 or 4 of this By-law commits an offence and in addition to the requirement of Parts 6 and 7, is liable to pay a fine not exceeding an amount equal to double the total amount of the uncollected or unremitted Waste Generation Levy.

9.2 **Fines Not to Exceed $5,000.** Any person who contravenes a provision of this By-law or any requirement made or imposed by this By-law commits an offence and is liable to a maximum fine of $5,000.

9.3 **Continuing Offences.** Where an offence under this By-law continues for more than one day, separate fines each not exceeding the maximum fine for that offence may be imposed for each day or part thereof in respect of which the offence occurs or continues.

9.4 **Additional Remedies.** Nothing in this By-law shall limit the District from utilizing any civil or other remedy that would otherwise be available to the District at law or in equity.

Read a first time this • day of June, 1997.

Read a second time this • day of June, 1997.

Read a third time this • day of June, 1997.

Reconsidered, passed and finally adopted by the Administration Board, upon receipt of at least 2/3 of the votes cast, this • day of June, 1997.

_____

Chairman

_____

Secretary

SCHEDULE A

CLASSES OF WASTE GENERATION LEVIES

1. Waste Measured By Weight

If the Waste Hauler measures any Waste by weight, the Waste Generation Levy for such Waste shall be calculated as follows:

(a)for all Waste, except Vancouver/Delta Waste, $• per tonne.

(b) for Vancouver/Delta Waste, $12 per annum.

2. Waste Measured By Volume

If the Waste Hauler measures any Waste by volume, the Waste Generation Levy for such Waste shall be calculated according to the following formula:

Waste Generation = N x S x CF x WCF x 4.33 x Rate

Where:

	N	= number of containers
	S	= size of container in cubic yards or cubic metres
	CF	= compaction factor (1 for uncompacted, 4 for compacted)
	WCF	= weekly collection frequency
	4.33	= number of weeks per month
	Rate	= $0.91 to $1.82 per cubic metre or $0.70 to $1.40 per cubic yard

[Note: The above assumes that the bylaw is to apply within Abbotsford. If this is not intended or if the fee is to be different for Abbotsford, a separate class could be created.]

SCHEDULE B

CERTIFICATE OF WASTE HAULER OR WASTE PRODUCER

[details required in order to establish what the certificate will require the hauler or producer to certify.]

SCHEDULE C

COMPENSATION TO WASTE HAULERS

[likely a straight % rate]

CITY OF
VANCOUVER

ENGINEERING SERVICES
Peter Judd, P.Eng., Acting General Manager

May 25, 2010

Toivo Allas, P.Eng.
Manager, Policy & Planning Department
Metro Vancouver
4330 Kingsway
Burnaby, BC V5H 4G8

Dear Toivo:

RE: Follow Up to Questions and Request for Additional Information: Consultation on Metro Vancouver's Draft Integrated Solid Waste and Resource Management Plan

Thank you and your staff for verbally responding to a number of our questions at the May 19, 2010 workshop on the draft Integrated Solid Waste Resource and Management Plan (ISWRMP). Further to that discussion, we look forward to receiving Metro Vancouver's written response to our May 17, 2010 list of questions and requested additional information (enclosed) as soon as possible and as committed to by your staff during the workshop. We expect this information will assist us in our June or early July reporting to Vancouver Council on the ISWRMP. So that we can meet our reporting timeline, which is based on Metro Vancouver's ISWRMP preparation and approval schedule, we would appreciate receiving this information no later than June 2, 2010.

Metro Vancouver staff's response to our questions and the discussion that followed at the workshop raised some additional questions and concerns. We are considering options for addressing these issues and may request additional information in the coming weeks. However, at this time I'd also like to take this opportunity to clarify our May 17, 2010 Question 1 and add to our Question 11 (c):

Question 1 - If 2009 "generated", "disposed" and "recycled" tonnage data organized by sector and by material type (i.e. as detailed in Table 2 in Metro Vancouver's *Recycling and Solid Waste Management 2008 Report*) is not yet available, we would like to receive a copy of the most current available data. We appreciate that there is uncertainty associated with most solid waste tonnage data, particularly when waste composition study results obtained from one year are applied to tonnage data in a different year to derive estimates of tonnes generated and disposed, by individual material type. I can assure you that we will acknowledge any such uncertainty in our utilization of this information.

Question 11 (c) - During the workshop your staff referred to a "Split Fee By-law" previously approved by the Metro Vancouver Board, that could be utilized to regulate solid waste flow

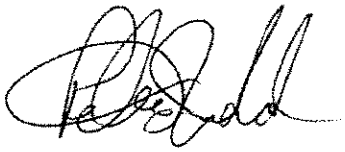
VANCOUVER
Host City

within the region. We would appreciate receiving a copy of this by-law, and information on when it was approved and how it would be utilized for solid waste flow control purposes.

Thank you in advance for providing this information at your very earliest convenience.

Please contact Chris Underwood, Manager, Solid Waste Management at 604.873.7992 if you would like to discuss our request in more detail.

Yours truly,



Peter Judd, P. Eng.
Acting General Manager, Engineering Services
City of Vancouver
peter.judd@vancouver.ca
Phone: 604.873.7303

Enclosure
/ceu

COPY

CITY OF VANCOUVER

ENGINEERING SERVICES
Peter Judd, P.Eng., Acting General Manager

May 17, 2010

Toivo Allas, P.Eng.
Manager, Policy & Planning Department
Metro Vancouver
4330 Kingsway
Burnaby, BC V5H 4G8

Dear Toivo:

RE: Consultation on Metro Vancouver's Draft Integrated Solid Waste and Resource Management Plan

As you are aware, on May 19th Metro Vancouver (MV) is hosting a workshop for Vancouver Council and staff on the draft Integrated Solid Waste Resource and Management Plan (ISWRMP). MV has indicated that the purpose of this workshop is for MV to provide information and invite feedback. Please find enclosed a list of questions and additional information we are requesting with respect to the current ISWRMP consultation process. We appreciate MV may not be prepared to provide a complete response to our request by May 19th; however, we hope that this list will help guide discussions during the upcoming workshop.

Yours truly,

Peter Judd, P. Eng.
Acting General Manager, Engineering Services
City of Vancouver
peter.judd@vancouver.ca
Phone: 604.873.7303

Enclosure

/ceu

May 17, 2010

METRO VANCOUVER'S DRAFT INTEGRATED SOLID WASTE RESOURCE AND MANAGEMENT PLAN (ISWRMP): CITY OF VANCOUVER QUESTIONS AND REQUESTED ADDITIONAL INFORMATION

Waste Statistics & Peformance Metrics

1. Based on MV's most recent waste composition study, what are the current (2009) estimated tonnes of regional solid waste generated, recycled and disposed, broken down by material type, for the residential, ICI, and DLC sectors and including "Take-Back" Programs? It is recognized that some of this information (for 2008) is provided in MV's *Recycling and Solid Waste Management 2008 Report*, but is primarily limited to gross tonnages, with the exception of a breakdown by material types for quantities recycled. A detailed summary of current tonnage data used by material type for waste generation and diversion modeling for the ISWRMP is requested.
2. In MV's *Recycling and Solid Waste Management 2008 Report* it is indicated that 266,043 tonnes of DLC waste was disposed in 2008. Based on City of Vancouver records, the Vancouver Landfill received 145,042 tonnes of DLC waste in 2008 (which were used for beneficial purposes).
   a) What is MV staff's understanding in terms of where the remaining 121,991 tonnes were disposed.
   b) In addition to what is listed in the draft ISWRMP, we are interested in understanding if additional public sector mechanisms have been considered by MV staff, including those that could be implemented by individual municipalities, which may incentivize the expansion of private sector DLC waste recycling opportunities?
3. The draft ISWRMP outlines various actions and strategies for achieving a minimum diversion rate of 70% by 2015. In supplementary material provided by MV as part of the current ISWRMP consultation process a planned diversion target of 600,000 tonnes of solid waste is indicated, of the 1,182,500 combined tonnes of Organic Wastes (food, paper and paperboard, yard waste), Wood Waste, Plastic Waste, and E-Waste & Small Appliances indicated as currently disposed (725,000, 240,000, 190,000 and 27,500 tonnes respectively).
   a) We would like to understand how the estimate of 600,000 tonnes of additional materials to be diverted was derived. What assumptions were made in the development of this forecast? We would also like to understand what MV staff consider as the degree of certainty with respect to the likelihood of achieving this target based on the ISWRMP proposed actions and strategies.
   b) Further, what assumptions were made in terms of limiting diversion to approximately 50% of the materials disposed (i.e. 600,000 tonnes planned diversion target of the 1,182,500 tonnes disposed), and what factors have been identified as preventing the diversion of the additional 582,500 tonnes of these materials that are estimated as remaining and requiring disposal?
   c) Has MV staff considered additional actions or strategies that could be led by MV or individual municipalities that are not included in the draft ISWRMP, but may increase diversion beyond the 70% by 2015 target? If so, we would appreciate MV staff's opinion of the expected risks and costs and the relative feasibility of implementing those additional measures.

4. The draft ISWRMP indicates that performance measures will include per capita waste generation and diversion tracked year-over-year.
   a) How does the current regional generation and diversion rates, and the target diversion rate of 70% compare to the Canadian average on a per capita basis?
   b) A target of 70% diversion by 2015 translates to a reduction of approximately 225 kg per capita in waste disposed (based on the current estimate of 1.5 tonnes of waste generated per person). In MV's staff's opinion, what is the upside and/or downside of including this metric in the ISWMRP?
5. What is MV staff's opinion on applying the 70% diversion target to individual waste sectors (i.e. ICI, DLC, single family residential, multi-family residential) instead of the target being applied to the aggregate amount of waste from these sectors as currently indicated in the plan?

Waste Diversion - Specific Materials

6. What is MV staff's opinion on:
   a) Vancouver's proposal for the ISWRMP to include the implementation of a region-wide ban on the disposal of commercial wood waste in Metro Vancouver landfills and incinerators by 2015;
   b) Vancouver's proposal for the ISWRMP to include a region-wide ban on the disposal of organics (food waste and other organic material, in addition to currently banned yard trimmings) in Metro Vancouver landfills and incinerators by 2015; and
   c) the feasibility, from a MV regulatory perspective, of banning the disposal of wood waste from private landfills within Metro Vancouver? Specifically, does MV staff consider additional regulatory authorities required to restrict or ban the disposal of DLC waste in private disposal facilities?

Energy Recovery from Waste after Recycling

7. We acknowledge that section 3.1.2 of the draft ISWRMP does not restrict waste-to-energy to mass burn incineration, and lists some technologies included within the description of waste-to-energy that have been broadly classified in literature as "conversion technologies". However, it has been implied by MV staff that they favour best available mass burn incineration technology as the preferred waste-to-energy option. What is MV staff's opinion on:
   a) redefining waste-to-energy within the ISWRMP to exclude mass burn incineration and only including conversion technologies, i.e. non-combustion thermal, chemical, biological, and mechanical technologies, or a combination thereof; and
   b) the technical and financial risks or advantages of this proposal?

Residuals Management

8. Section 3.2.1 of the draft ISWRMP includes the action, "City of Vancouver will recover landfill gas from the Vancouver Landfill and strive to maximize the beneficial use of the recovered gas". Section 4.1.1 (a) indicates that MV will, "monitor the Vancouver Landfill to ensure compliance." Given regulatory oversight of the Vancouver Landfill is the responsibility of the BC Ministry of Environment and the Landfill is required to operate in accordance with a Ministry issued Operational Certificate and other applicable Ministry regulations, we would like to understand why MV is implying that they consider it necessary and advantageous to achieving the desired outcomes of the ISWRMP to assume

this new and somewhat duplicate responsibility. It should be noted that a condition of the 1999 Vancouver-Delta Agreement requires that the City operate the Landfill in compliance with the Operational Certificate.

9. MV has implied that new waste-to-energy (WTE) capacity could be available by 2015. This timeline appears very optimistic. Further, with the anticipated closure of the current Cache Creek Landfill in 2012 residuals management bridging options would be required prior to the commissioning of MV's proposed new WTE capacity.
   a) How would MV staff characterize the certainty associated with the WTE implementation timeline (for example, relative to timelines of similar projects in North America)?
   b) What contingency options are being considered by MV if this WTE timeline cannot be achieved? What are the expected risks and costs associated with those contingency options?
   c) What bridging options are being planned (for when Cache Creek closes)? What are the expected risks and costs associated with plans?

Financial Implications

10. The draft ISWRMP indicates that solid waste disposal net expenditures are projected to decrease by 39% to $220 million annually (a decrease of $140 million/year) based on reduced waste quantities and increased revenue from energy recovery.
    a) How is this decrease apportioned between savings from reduced waste quantities and energy revenue?
    b) What assumptions were made with respect to fixed versus variable cost savings from reduced waste quantities?
11. The draft ISWRMP also indicates that the per capita cost for recycling will be higher than disposal at the proposed 70% diversion rate (i.e. $121 versus $99), but that the regional tipping fee will be established to ensure financial incentive to encourage diversion. Presumably, that strategy will involve setting the regional tipping fee high enough so that it will generate excess revenue to offset increased recycling costs.
    a) What is MV staff's opinion with respect to the economic sustainability of this strategy in the context of reducing waste requiring disposal?
    b) What is MV staff's opinion with respect to risk associated with leakage of waste outside of the regional system?
    c) What strategies has MV staff considered to control the flow of waste within the region for the purpose of maintaining a stable source of funding for the waste diversion initiatives proposed in the ISWRMP?
12. With respect to the proposed Eco Centres:
    a) How much additional tonnage of recyclables is expected from Eco Centres?
    b) What is the breakdown in anticipated Eco Centre funding between forecasted tipping fees and forecasted revenue from the sale of recycling materials as commodities?
    c) With respect to ISWRMP section 2.2.7 (d) what is proposed in terms of municipal funding responsibilities for the establishment of Eco Centres?
13. Would MV consider exploring alternative mechanisms for funding waste diversion initiatives, such as a sales tax or Regional tax similar to the current fuel tax, which would likely require Provincial approval in recognition of the public good aspect of the plan?

14. MV staff have reported that, based on independent financial analysis, over 35 years out-of-region landfilling would cost the region $1.5 billion while waste-to-energy would result in a net profit in the order of $20 million.
    a) We would like to understand how these estimates were derived. Specifically, what were the underlying assumptions made in the development of this forecast?
    b) The estimated profit for waste-to-energy appears optimistic, and we acknowledge that MV's consultant has reported that these are planning-level estimates. In MV staff's opinion what risks are associated with achieving these returns (upside or downside)?
    c) What is MV staff's opinion on different risk mitigation options such as transferring risk to one or more privately owned and operated facilities, under, for example, a franchise license agreement with MV receiving economic benefits?
15. We would appreciate information on how waste composition and tonnage was modeled for the financial analysis of disposal facilities through to 2035. In particular, what was assumed with respect to reduced materials requiring disposal as a result of expanded EPR programs?

RTS 8751
ATTACHMENT 4

Metro Vancouver June 3, 2010 Staff Technical Forum Presentation

Metro Vancouver's Draft Integrated Solid Waste and Resource Management Plan

Staff Technical Forum
June 3, 2010

metrovancouver

Metro Vancouver's zero waste CHALLENGE

Contents

1. Overview of Plan
2. Draft Plan - Goals 1 & 2
3. Draft Plan - Goals 3 & 4
4. Performance Measures
5. Financial Implications

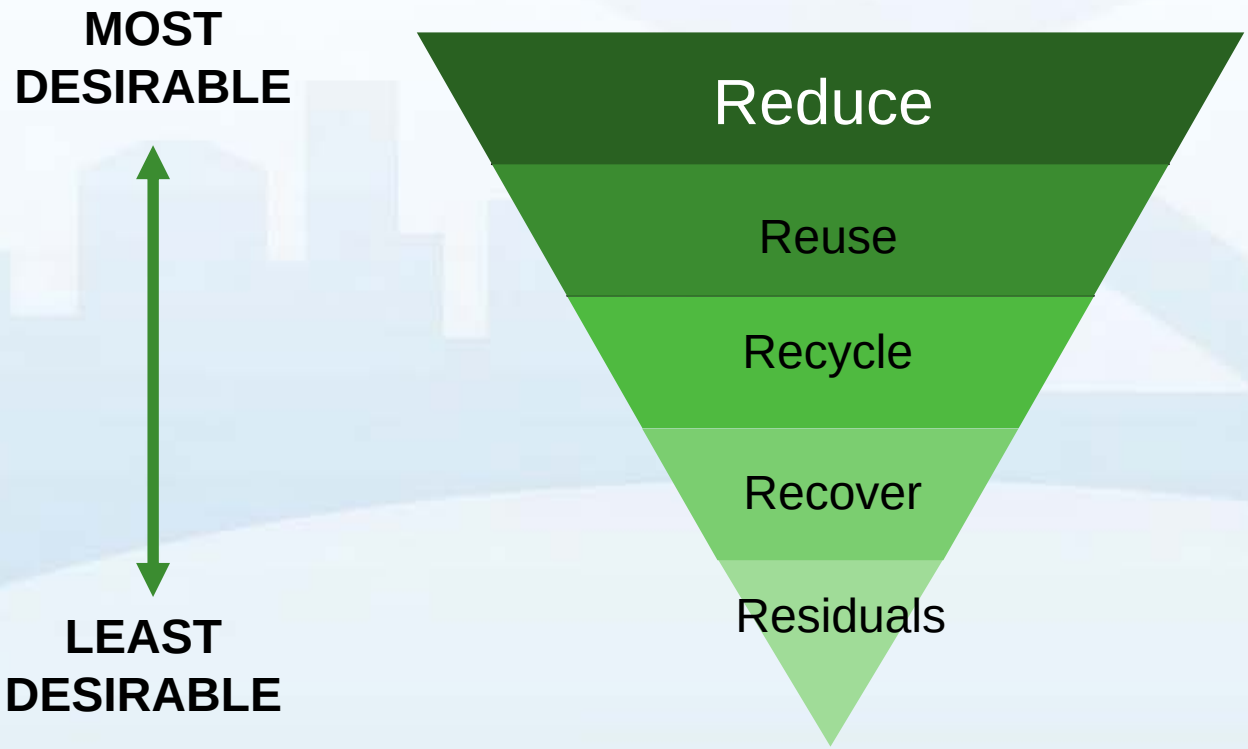
Plan Overview

Part A, Context of Plan

- Guiding Principles
- Resource Management Principles: The 5Rs
- Process and Consultation
- Aligning With Provincial Plans
- Coordinating With Other Metro Plans

Plan Overview

- Sustainability Driven Plan
- Integrated Resource Recovery
  - waste is a resource
- Resource Management Principles: The 5Rs



Plan Overview

Part B, Goals, Strategies, Actions, Measures

Goal 1 : Minimize Waste Generation

Goal 2 : Maximize Reuse, Recycling, and Material Recovery

Goal 3 : Recover Energy From Waste Stream After Recycling

Goal 4 : Dispose of All Remaining Waste in Landfill After Material and Energy Recovery

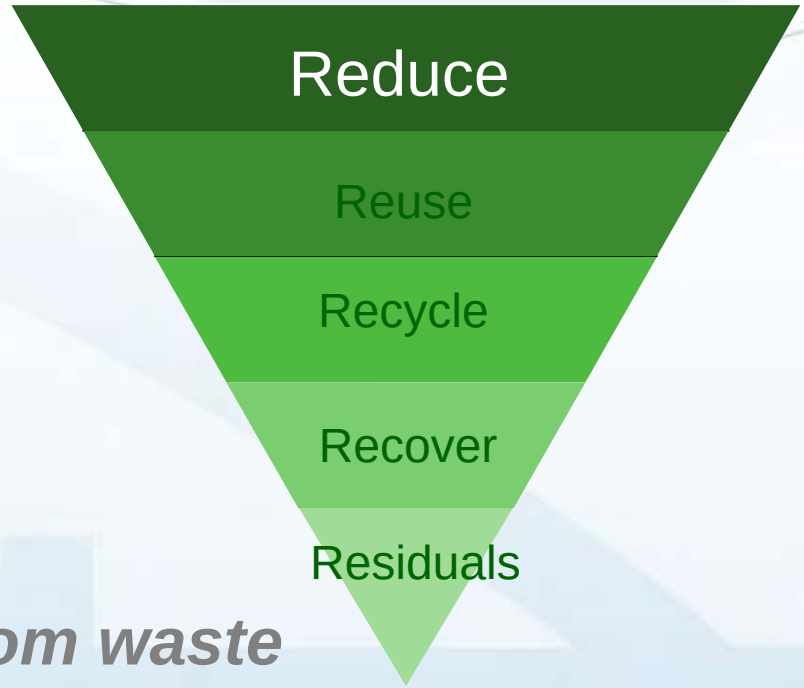
Draft Plan

GOAL 1 ***Minimize waste generation***

GOAL 2 ***Maximize reuse, recycling, and material recovery***

GOAL 3 ***Recover energy from waste stream after recycling***

GOAL 4 ***Dispose of all remaining waste in landfill after material and energy recovery***

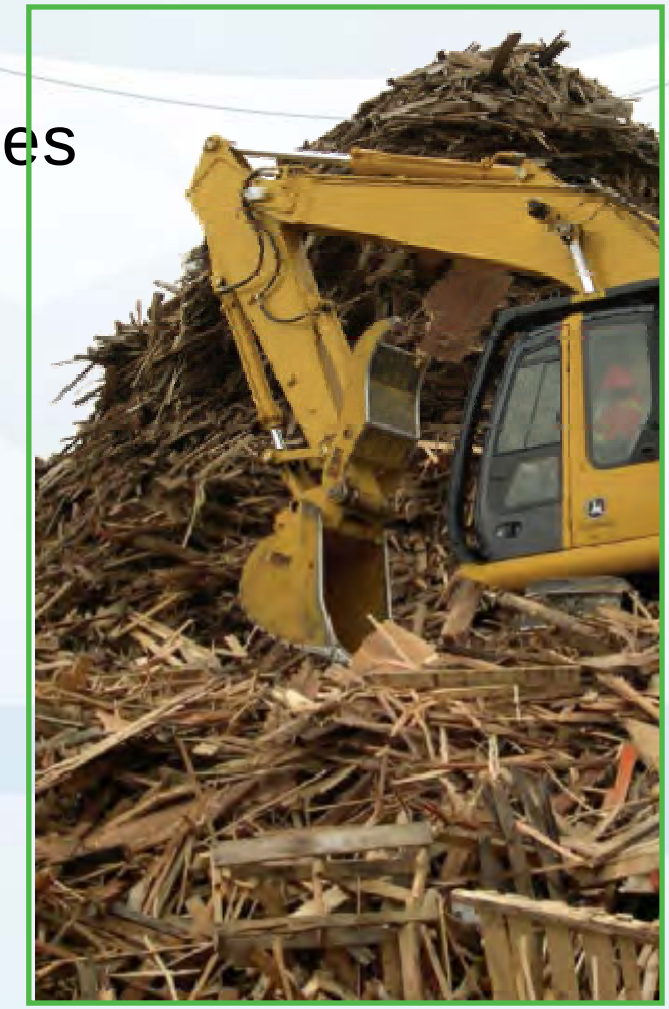


Organics

- Regional composting and biofuel

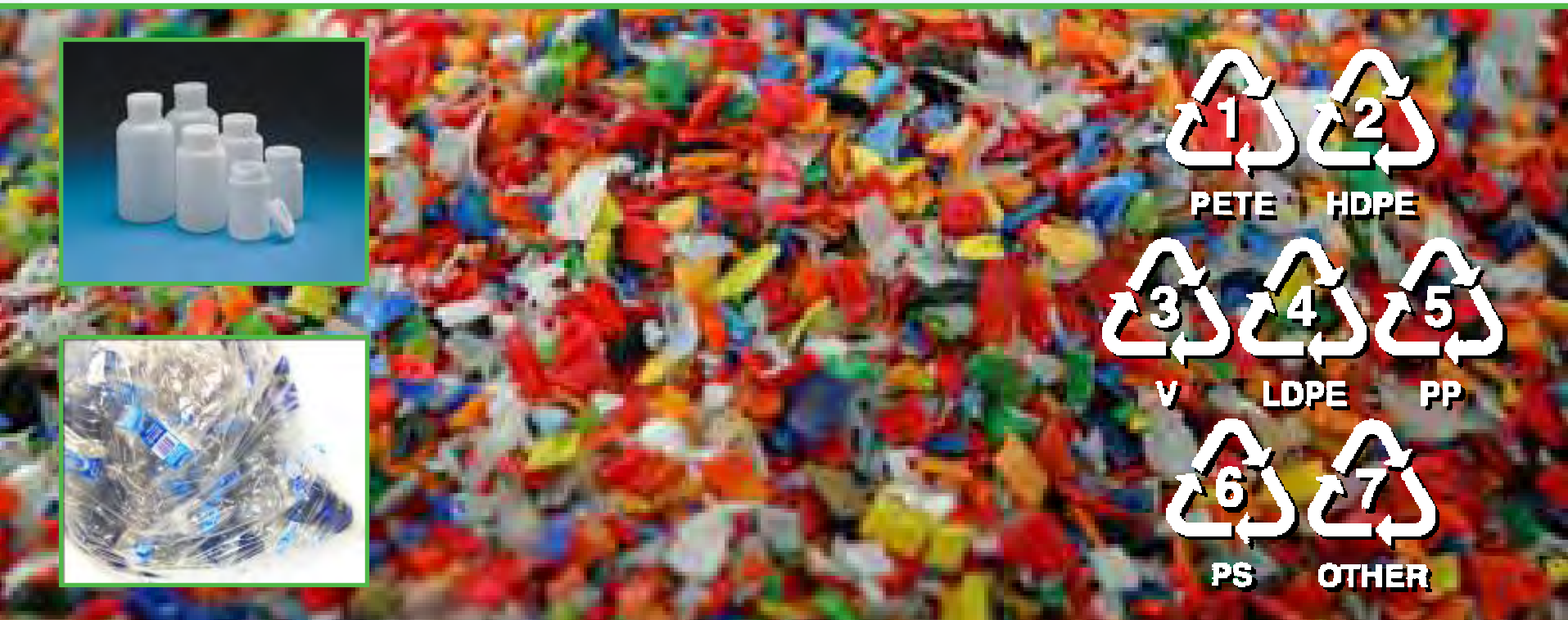
Demolition, Landclearing and Construction

- Mandatory recycling on jobsites
- Wood reuse



Plastics

- Reduce use, increase recycling



Provincial EPR Programs

- Accelerate expansion – mercury, small appliances, packaging

Mandatory Recycling

- In all multi-family and commercial buildings

Additional Material Bans

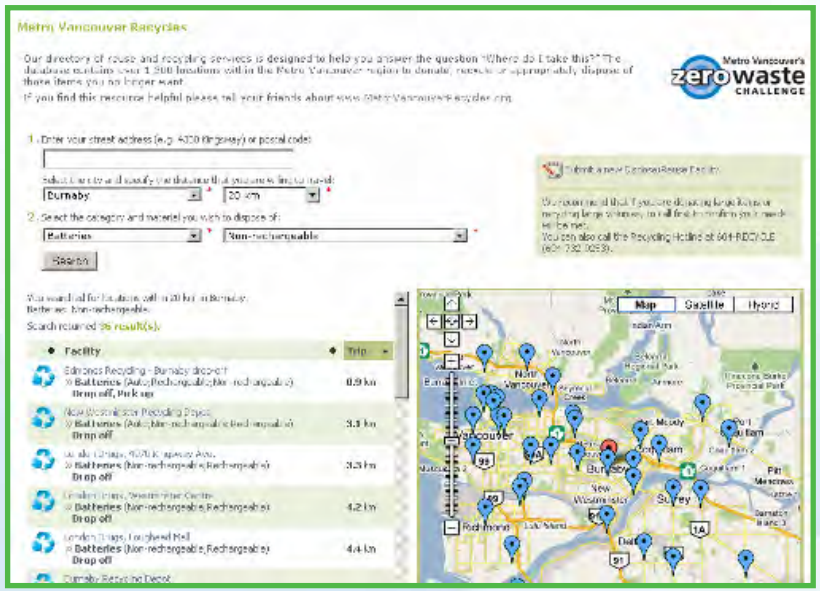
Establish Eco-Centres

Recycling

- Expand programs, develop markets, toughen regulations

Inform and Educate

MetroVancouverRecycles.org



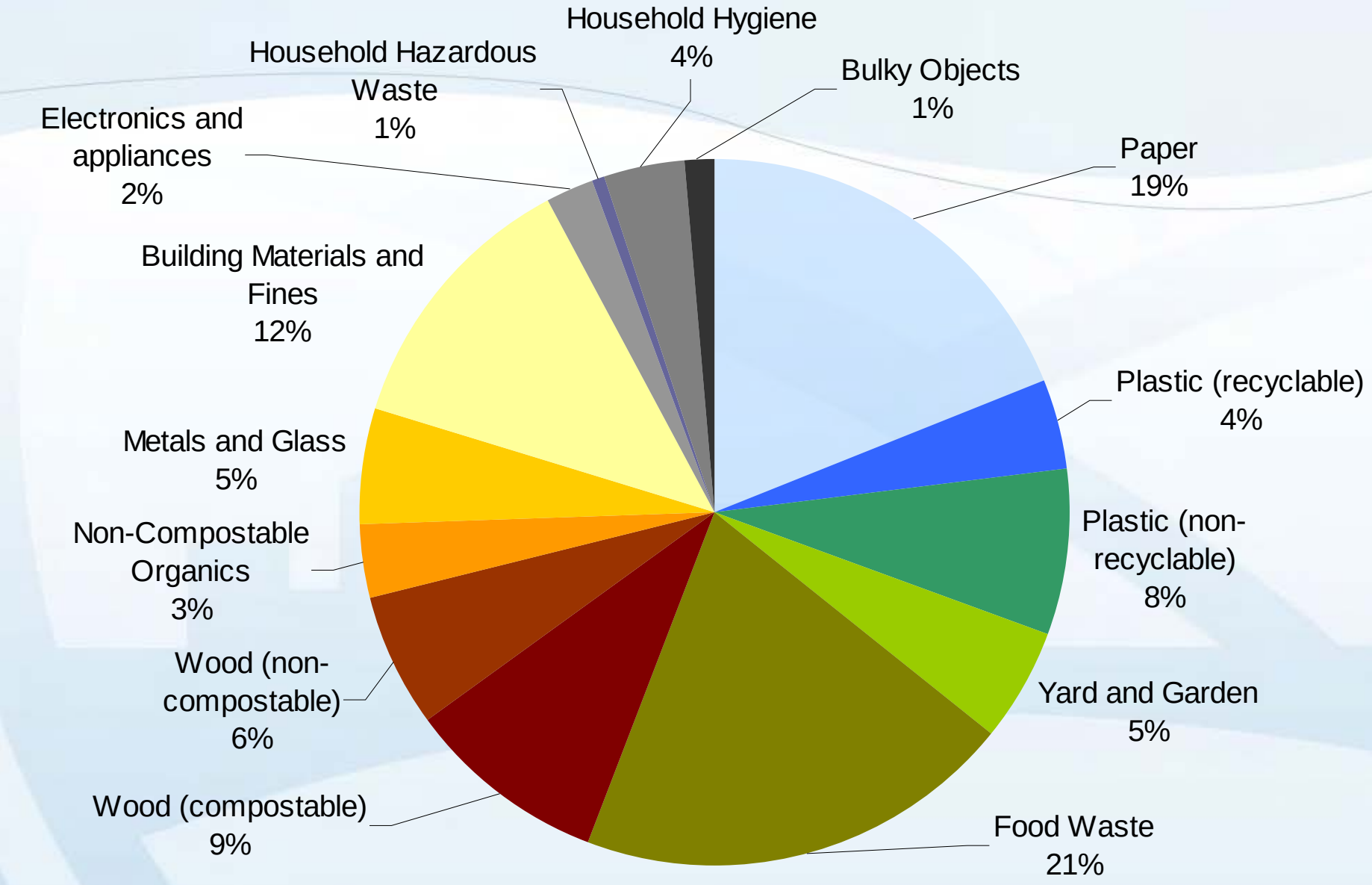
A Minimum of 70% Diversion

	Quantity Currently Disposed (tonnes)	Planned Diversion Program(s)	Planned Diversion Targets (tonnes)
Organic Wastes Food Waste Paper and Paperboard Yard Waste	725,000	Composting, Biofuel, Disposal Bans	395,000
Wood Wastes	240,000	Modify Permit Process, Wood Drop Off at Transfer Stations & Eco-Centres	155,000
Plastic Waste	190,000	Expansion of Plastics Recycling	30,000
E-Waste and Small Appliances	27,500	Extended Producer Responsibility	20,000
TOTAL	**1,182,500**		**600,000**

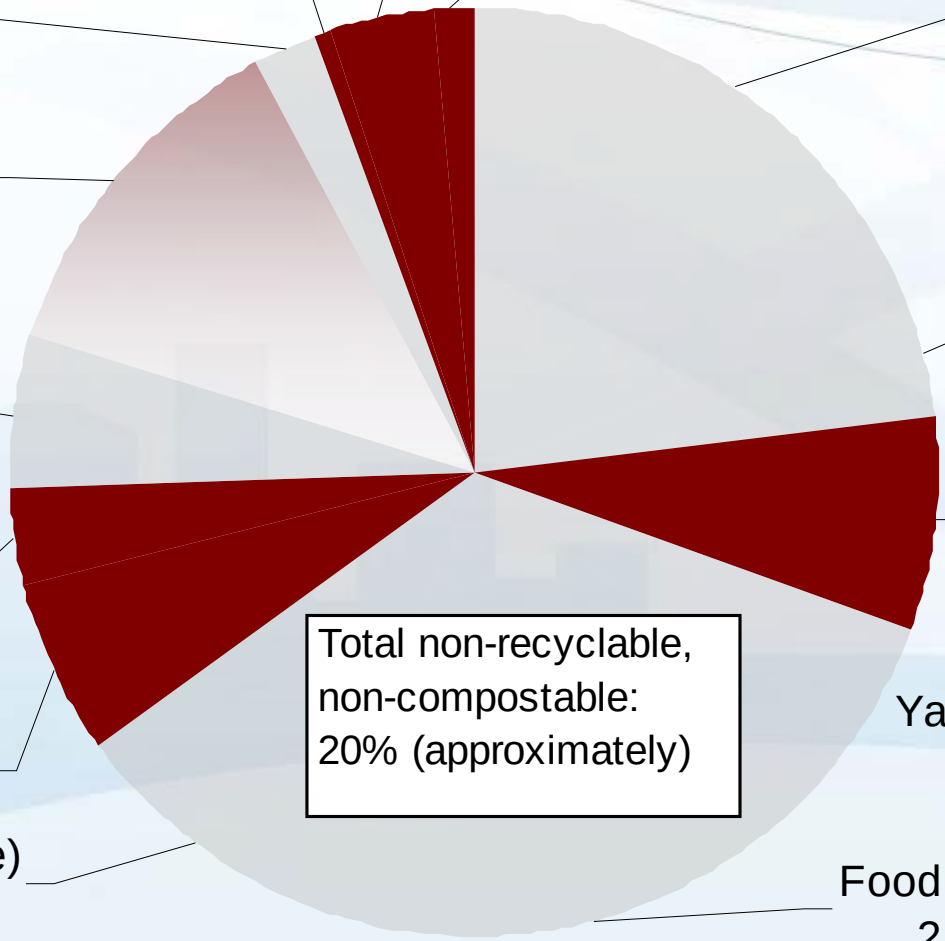
Practical Limits

- Manufacturing takes place elsewhere
- Products constructed of multiple materials
- Contaminated materials
- Textiles, leather, personal hygiene products
- Residual material from recycling (plastics 20%)
- Limited markets/high costs

Composition of Disposed Waste (2007)



Composition of Disposed Waste (2007)



Household Hygiene 4%

Household Hazardous Waste 1%

Bulky Objects 1%

Electronics and appliances 2%

Paper 19%

Building Materials and Fines 12%

Plastic (recyclable) 4%

Metals and Glass 5%

Plastic (non-recyclable) 8%

Non-Compostable Organics 3%

Total non-recyclable, non-compostable: 20% (approximately)

Wood (non-compostable) 6%

Yard and Garden 5%

Wood (compostable) 9%

Food Waste 21%

2007 population
2.23 million
Waste generation
3.4 million tonnes

55%
1.9 million tonnes recycled

45%
1.5 million tonnes disposed

2015 population
2.55 million
Waste generation
3.9 million tonnes

70%
2.7 million tonnes recycled

30%
1.2 million tonnes disposed

Managing Remaining Waste

SWMP Goals 3 & 4

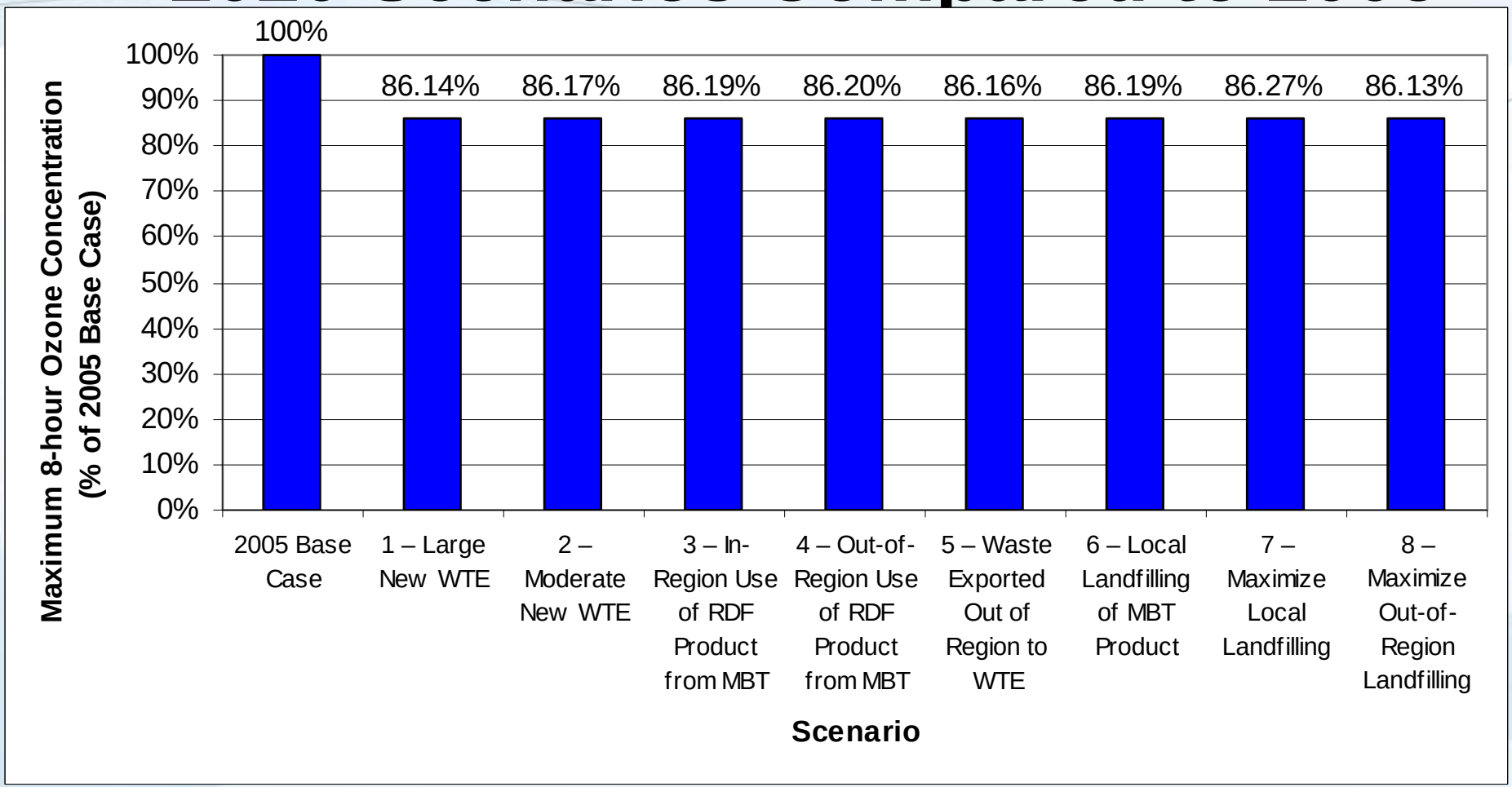
AECOM Report

AECOM study considered a number of waste management scenarios:

Scenarios=Existing WTE Facility + scenario + balance of untreated MSW landfilled

	Scenario Name	Scenario Description
1	Large new WTE	750,000 t/a new WTE capacity
2	Moderate new WTE	500,000 t/a new WTE capacity
3	In region use of RDF product	500,000 t/a to MBT facility for RDF
4	Out of region use of RDF product	500,000 t/a to MBT facility for RDF
5	Waste exported out of region to WTE	500,000 t/a exported to out of region WTE facility
6	Local landfilling of MBT product	995,000 t/a processed by MBT and locally landfilled
7	Maximize local landfilling	750,000 t/a to Vancouver Landfill, remainder to out of region LF
8	Maximize out of region landfilling	230,000 t/a to Vancouver Landfill, majority to out of region LF

Airshed Ozone Levels for 2020 Scenarios Compared to 2005



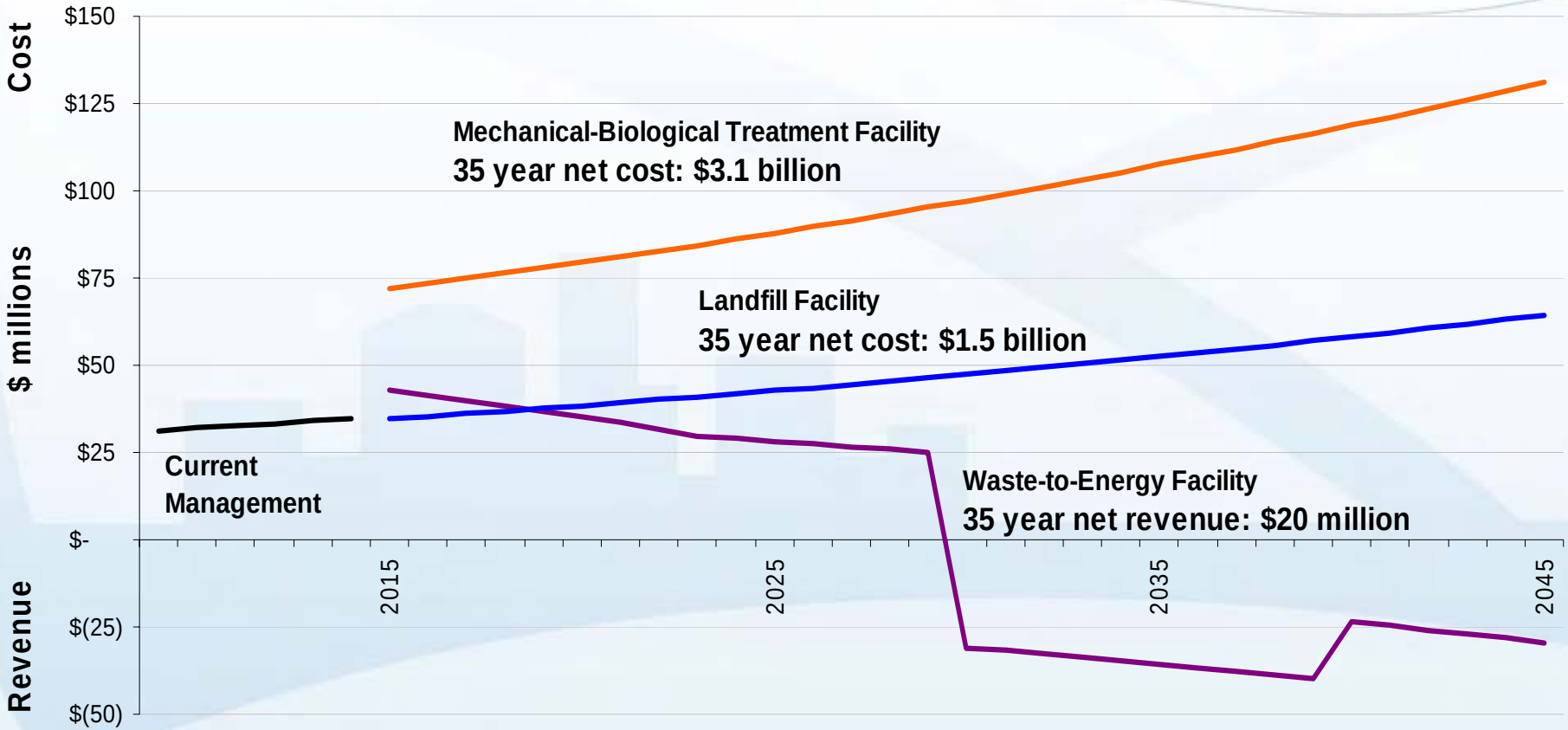
No discernible difference between scenarios

Performance for Waste Management Facilities (500,000 tonnes/year)

	In-Region Waste-to-Energy	Out-of-Region Landfill
Total Emissions per Year:		
NOx (tonnes)	-80	95
SOx (tonnes)	-80	20
PM10 (tonnes)	-2.4	2.1
PM2.5 (tonnes)	-2.4	1.5
CO (tonnes)	-240	390
VOCs (tonnes)	-155	60
Ammonia (tonnes)	7.3	40
Mercury (kg)	18	0.2
Dioxins & Furans (mg TEQ)	0.5	16.5
GHGs (tonnes CO2e)	123,000	127,000

Negative values indicate a net reduction

35-Year Net Cost of Disposal Facilities
(500,000 tonnes per year capacity)



Consultants' Findings

	Net Air Emissions	LFV Net Air Emissions	Greenhouse Gases	Heat & Electricity	Disposal Cost
With MBT	2nd	3rd	1st	3rd	3rd
With Landfill	3rd	1st	3rd	2nd	2nd
With WTE	1st	2nd	2nd	1st	1st

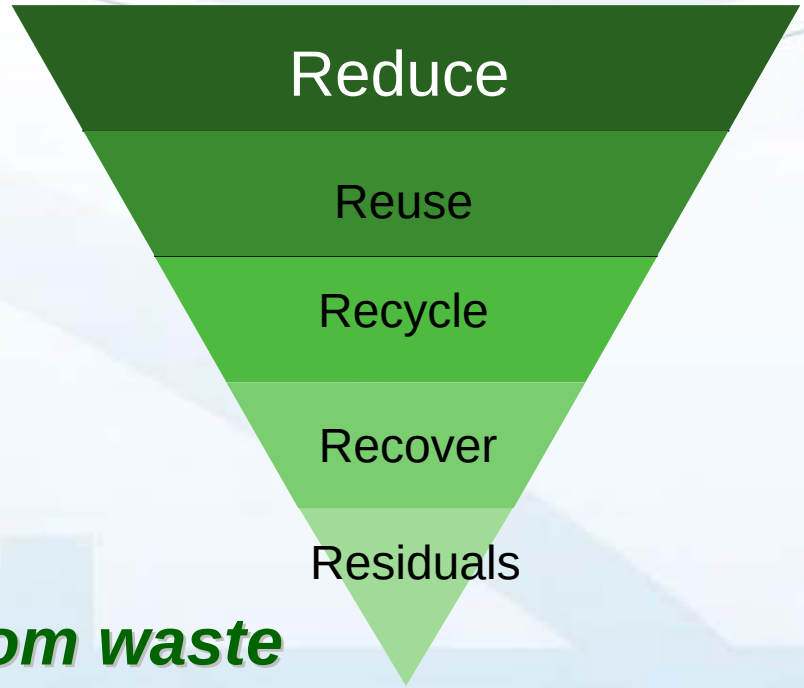
Draft Plan

GOAL 1 *Minimize waste generation*

GOAL 2 *Maximize reuse, recycling, and material recovery*

GOAL 3 ***Recover energy from waste stream after recycling***

GOAL 4 ***Dispose of all remaining waste in landfill after material and energy recovery***



Goal 3: Recover Energy from the Waste Stream After Material Recycling

- Continue using the existing WTE facility in Burnaby
- Increase WTE capacity in the region up to a limit of 500,000 t/year (replace Cache Creek Landfill)
- Maximize energy recovery through district heat and electricity
- Monitor trends in waste diversion and disposal and implement additional WTE capacity only if justified by these trends
- Scale WTE capacity so that total capacity does not exceed most probable minimum waste flow projection
- Recover metals and ash for beneficial use
- Recover landfill gas at the Vancouver Landfill and strive to use beneficially

Goal 4: Dispose of all Waste in Landfill, After Material Recycling and Energy Recovery

- Utilize the Vancouver Landfill for any remaining waste not directed to WTE subject to existing permits and agreements
- Where existing permits and agreements work to the contrary of the regional community, work in good faith to resolve
- Establish contingency disposal at out-of-region landfills if capacity within the region is insufficient
- Ensure disposal capacity is available for DLC waste

Performance Measures

Goal 1:

- Waste generation per capita
- Increase of product stewardship initiatives

Goal 2:

- Overall diversion rate
- Diversion rate per capita
- Recycled material quantity

Goal 3:

- Energy outputs from residual waste
- Greenhouse gas production and offset

Goal 4:

- Treated waste per capita to landfill
- Untreated waste per capita to landfill

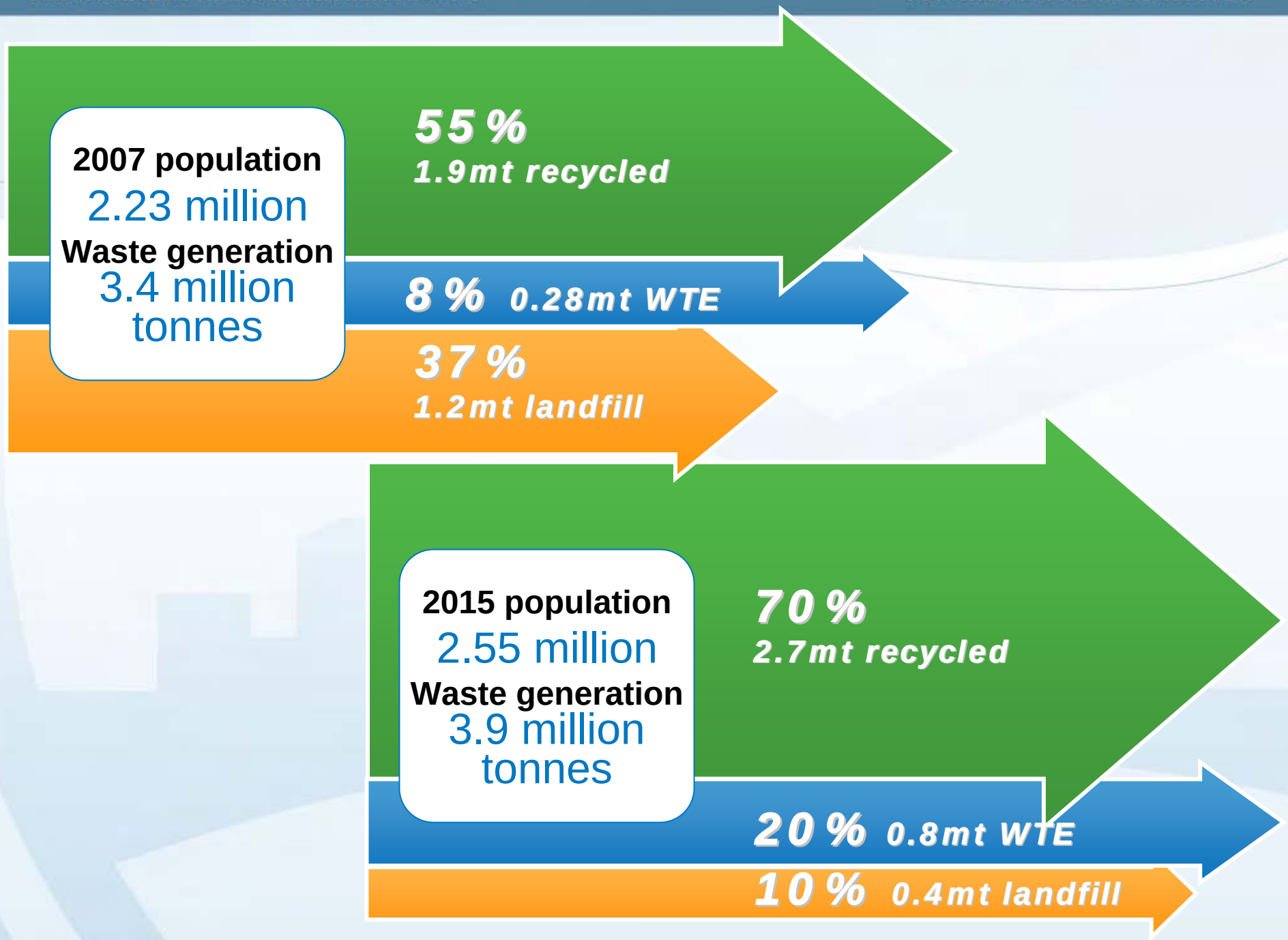
Financial Implications

Current Regional Annual Costs:

- Recycling: $190 million
- Disposal: $360 million
- Total: $550 million

Proposed ISWRMP Regional Annual Costs:

- Recycling: $270 million (42% increase)
- Disposal: $220 million (39% decrease)
- Total: $490 million (11% decrease)


2007 population
2.23 million
Waste generation
3.4 million tonnes
55 %
1.9mt recycled
8 % 0.28mt WTE
37 %
1.2mt landfill
2015 population
2.55 million
Waste generation
3.9 million tonnes
70 %
2.7mt recycled
20 % 0.8mt WTE
10 % 0.4mt landfill

Discussion

CITY OF VANCOUVER

RTS 8751 ATTACHMENT 5

Solid Waste Stewardship 2020

June 15, 2010 Draft

INTRODUCTION

Purpose:

The purpose of this document is to articulate a high-level and broad vision for improved stewardship of solid waste for Vancouver looking out to 2020. It is intended as a framework to guide change and serve as the first step in establishing focus and a bearing in terms of *where we want to be*. It is also meant to serve as a reference point for developing consensus before commencing detailed and time committing business planning work necessary to chart a course and understand *how we will get there*.

Guiding Principles - Integration with Greenest City Action Team Recommendations:

This vision is intended to compliment and align with the goals established by the Greenest City Action Team (GCAT). Specifically, there are targets and objectives within GCAT's *Vancouver 2020: A Bright Green Future* and *Quick Start Recommendations* that serve as guiding principles to this vision (Appendix 1).

Overall, this vision is meant to be a made-for-Vancouver solution, developed within the context of Vancouver becoming the Greenest City in the world by 2020. However, this vision also aims to maximize synergies with Metro Vancouver's (MV) draft new Solid Waste Management Plan (SWMP)[1] where there are common sightlines (Appendix 2). More specifically, actions within the vision are designed to build on the strengths of the draft SWMP, and those qualities are used as launching points for Vancouver to lead the region in waste management excellence.

VISION OUTLINE

GCAT has established a target of reducing solid waste going to landfill or incineration by 40% per capita by 2020, with the long-term goal of creating zero waste. To achieve this target it is proposed that the long established and internationally recognized 5Rs hierarchy of waste management (*R*educe, *R*euse, *R*ecycle, *R*ecover, and *R*esiduals management) be utilized to the fullest extent possible. Specifically, it is proposed that Vancouver implement measures that benefit the community and the City's corporate operations, based on (in order from most to least desirable):

- **waste avoidance and minimization as the highest priority;**
- **maximizing reuse, recycling and composting for end-of-life materials;**
- **beneficially utilizing energy from specific materials that remain after recycling and composting, e.g. using 'niche' non-combustion thermal, mechanical, biological, or chemical systems, and not mass burn incineration; and,**
- **exhausting efforts from the above three steps so that long-term dependency on the Vancouver Landfill is reduced and the limited capacity available is used conservatively to minimize environmental impacts.**

LEADING PRACTICES

There are various public sector organizations that are recognized leaders in waste management and diversion. Examples include the Regional District of Nanaimo, Halifax Regional Municipality, City of Charlottetown Prince Edward Island, and the City of San Francisco. Key success factors to achieving high diversion rates in these organizations include the establishment of:

- integrated and strong partnerships;
- convenient options for reuse, recycling and composting;
- progressive policy and legislation; and
- comprehensive education and promotion programs.

[1] Metro Vancouver's *Integrated Solid Waste and Resource Management Plan (ISWRMP)*, April 28, 2010 Draft

FUTURE STATE

Proposed Goal:

To be world class by 2020 in terms of solid waste policies and practices, achieved through a multi-faceted strategy involving leadership, progressive stewardship, community empowerment, and strategic enforcement, and founded on the 5Rs (*R*educe, *R*euse, *R*ecycle, *R*ecover, and *R*esiduals management).

Proposed 10 Point Plan:

LEADERSHIP

1. ***Vancouver's commitment to extended producer responsibility (EPR) is firm and recognized as the cornerstone of sustainable waste management policy.***

- The City increases return-to-retail opportunities through development approval authorities.
- The City's ownership of land and zoning authority is utilized to create new return-to-depot opportunities.
- The City adopts closed-loop supply chain policies and systems so that locally generated waste materials are used as feedstock resources in production processes, resulting in the local manufacture and supply of high recycled content products.
- Staff work proactively with MV and the Province on the expansion of EPR policy to include items such as packaging.

2. ***The City leads by example and through strategic partnerships to develop effective solutions, buy-in and participation.***

- A comprehensive corporate waste diversion program is developed and implemented for all facilities.
- City service delivery is coordinated with neighbouring agencies including the Vancouver School Board and University Endowment Lands.
- Social enterprise organizations and the marginalized population assist with the delivery of program promotions and informational materials.
- The City partners with Metro Vancouver, industry Product Stewards and social agencies for the development of new recycling depots and material reuse centres.

3. ***Vancouver is an incubator for new and emerging waste management technologies, such as waste conversion[2] systems, which involve the recovery of materials, nutrients and/or energy from waste remaining after recycling and composting.***

- A call for expressions of interest is issued to develop a database of solid waste conversion technology providers and attract new green businesses, with particular emphasis on 'niche' opportunities targeting specific waste streams and utilizing those materials as resources.
- Triple bottom line evaluation criteria is developed and used to screen and rank different material processing technologies, e.g. the highest and best use of commercial food waste is well understood for pursuing new diversion opportunities, such a composting or anaerobic digestion as the primary means of processing food waste.
- Waste streams under Vancouver's stewardship are made available to support pilot-scale alternative waste processing technology projects.

[2] "Conversion" technologies are generally defined as those that involve non-combustion thermal, mechanical, biological, or chemical processes

PROGRESSIVE MANAGEMENT

4. *Robust and transparent evaluation, measurement and verification mechanisms are developed and utilized for the routine reporting of performance.*

- All Solid Waste Utility and street cleaning programs and practices are regularly evaluated against industry best practices and adjusted accordingly.
- Per capita waste generation and diversion will be utilized as a primary performance monitoring metric. Specifically, the current annual per capita waste generation rate is 1.5 tonnes, of which about 55% is diverted from disposal; therefore approximately 675 kg is disposed per person each year. The GCAT target of 40% reduction by 2020 translates to reducing disposal by 270 kg per person by 2020.
- Corporate waste diversion performance is routinely evaluated against leading practices.

5. *The limited capacity of the Vancouver Landfill is used conservatively. The facility is regarded as British Columbia's showcase of excellence in waste management operations and public education.*

- Site operations maximize diversion of waste to reuse and recycling opportunities on or off site.
- The site is utilized to host new materials processing capacity (linked with #3 above).
- Operational and environmental requirements are exceeded with emphasis on minimizing all environmental impacts (air and water) and on-site use of materials.
- Landfill gas is reused in technologies that optimize greenhouse gas reduction benefits such as fuelling the City fleet, e.g. waste transfer trailers and on-site heavy equipment.
- The site hosts global training, workshop and conference events to showcase operating practices and research and development results.

6. *New and expanded solid waste services are provided to citizens and the City's corporate operations.*

- City collection service is expanded to include neighbourhood schools and libraries.
- City-wide composting opportunities are provided to all sectors.
- Best practice reduce, reuse, recycling and compost programs are provided across all City business units.
- Public realm/on-street and special event recycling opportunities are increased by 100 percent.
- Improved bulky item collection opportunities are made available to residents, through partnerships with existing businesses and non-profits, or a new City service.
- New public recycling depots/ecocentres are designed to LEED Platinum standards and constructed as model facilities for the world.

COMMUNITY EMPOWERMENT

7. *Citizens and the City's own corporate community are provided with the information and tools necessary for sustained behavioural change; educational materials and outreach activities are designed with the goal of being transformative and raising the collective consciousness of citizens and City staff.*

- Community based social marketing is used as the primary means of engaging the community and for promoting change.
- Public programs are designed with a particular emphasis on empowering youth. Social media and other leading edge education and communications tools are fully utilized.
- Programs are designed so as to invoke healthy corporate waste diversion peer pressure within the industrial, commercial and institutional sectors, and within the City's corporate operations.

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8. *Public support is leveraged through a large, committed, cohesive, and well organized volunteer community; community leaders are partners with the City in the delivery of outreach activities.*

- New resources are dedicated to build and coordinate a volunteer corps.
- The City develops new volunteer programs based on leading practices e.g. Master Composter and Recycler Training, Cities of Edmonton and Portland; Recycling Block Captains, City of Chicago; Keep Vancouver Spectacular, City of Vancouver.

STRATEGIC ENFORCEMENT

9. *Public education and enforcement ('carrot and stick') approaches are balanced and integrated; enforcement systems are swift, meaningful and effective.*

- Amalgamation of resources and other new opportunities for collaboration on the delivery of enforcement programs amongst City departments are pursued for greater efficiencies through economies of scale.
- The Municipal Ticket Information system is expanded to enforce Solid Waste By-law infractions.
- New resources are provided to target banned materials disposed at source (i.e. at "curb side").
- Incentive based programs are developed, such as positive ticketing for residential recycling compliance and expedited permitting (similar to Seattle's Residential Deconstruction permitting program).

10. *Work to expand Vancouver's By-law authority[3].*

- A work group is established involving staff from Metro Vancouver and potentially Vancouver's neighbouring municipalities to develop regulatory options and enforcement mechanisms to reduce the risk of leakage of waste materials outside of the regional waste management system.
- The City works closely with the Province to develop structural changes with how waste collection and diversion is organized within the private sector, e.g. franchising of IC&I sector waste collection services within Vancouver.

CONCLUSION

Successfully achieving this vision will require detailed planning and commitment by Council, staff, Metro Vancouver, the Province and the City's stakeholders. Perhaps most importantly, reaching the desired future state will require new and sustained resources. Achieving change will not come without a cost and resistance. However, once these challenges are overcome through progressive policies, strategic planning and levels of funding and staff resources matched to demand, Vancouver will be well positioned to be a world class leader in the stewardship of solid waste.

[3] Vancouver Charter amendments are subject to the approval of the Province

Appendix 1

Specific GCAT Goals, Targets & Actions Aligned with this Vision:

General: - lead by example - develop strategic partnerships - communicate & engage to increase awareness & motivate action - pursue financing mechanisms to supplement existing city resources - advocate progressive policies in senior government
Green Economy Capital: - attract new business & create new green jobs (green businesses use materials more efficiently) - create Low-Carbon Economic Development Zones & a green entrepreneur 'kick-start' program - buy local
Climate Change Leadership: - reduce GHG emissions 33% from 2007 levels - eliminate dependence on fossil fuels - integrated planning - treat waste as a resource - substitute renewable resources for natural gas
Green Buildings: - lead the world in green building design & construction (green buildings are designed to minimize waste)
Clean Vehicles: - green the City's fleet
Zero Waste: - reduce solid waste going to landfill or incineration by 40%[4] per capita with a long range view of zero waste - view waste as a resource - change policies, business practices and consumer behaviours - waste reduction is top priority, through by-laws, education, and expansion of extended producer responsibility (EPR) programs (also referred to as industry product stewardship) - ban or tax plastic bags and polystyrene foam take-out containers, cups and utensils, by pressuring the Province to impose a province wide ban, or provide the City with the required Charter authority - accelerate work with Metro Vancouver to implement city-wide composting, including support for backyard composting and neighbourhood-scale pilot projects - improve business and multi-unit residential recycling programs, which will require cooperation with Metro Vancouver and additional resources for outreach, education, monitoring and enforcement - adopt a comprehensive recycling and composting by-law requiring everyone (all sectors) to sort their waste into containers designated for recycling, composting and garbage (and require building owners to educate tenants, employees and contractors on how to separate) - strengthen existing measures for construction, renovation and demolition waste

[4] Current annual per capita waste generation (residential, DLC and ICI sectors combined) is approximately 1.5 tonnes, of which 55 percent is diverted primarily through recycling and composting. Thus approximately 675 kg annually is currently disposed per person. Therefore, GCAT target is to reduce disposal rate by 270 to 405 kg per person per year by 2020, which results in an overall diversion rate target of approximately 73% (i.e. [1.5 tonnes generated – 0.405 tonnes disposed] / 1.5 tonnes generated).

- create one or more Re-use Centres - reduce hazardous waste at source through Provincial product stewardship programs, public education and outreach, including support for local businesses (Vancouver should work with other municipalities, the Provincial government and industry to expand the scope and effectiveness of EPR programs) - apply community based social marketing principles emphasizing direct contact among community members and the removal of barriers - develop aggressive waste reduction strategies for Corporate operations - shift to every other week garbage collection - Keep Vancouver Spectacular all year around
Developing Campus-City Connections: - energize the relationship between University and City staff, and explore best practices and policy innovations for a range of urban environmental subjects
Lighter Footprint: - reduce per capita ecological footprint by 33 percent by 2020 through messages such as "living better, using less" (waste reduction and recycling contribute to minimizing ecological footprints)
Comprehensive Environmental Sustainability Framework: - create a green technology advisory group with international scope to advise the City about new technologies, enabling Vancouver to become an early adopter - create a departmental Greenest City ambassadors program embedding Greenest City actions into departments and services
Clean Air: - meet world health organization recommendations for air quality

Appendix 2

Draft Regional Solid Waste Management Plan Elements Aligned with this Vision:

Waste Management 5Rs Hierarchy:

Goals are prioritized based on the long established and internationally well recognized 5Rs hierarchy:

Reduce - avoid creating waste in the first place
Reuse - reuse items and materials that would otherwise be discarded
Recycle - remanufacture discards into new products and materials
Recover - capture and utilize materials and energy from discards
Residuals - responsibly manage what is left over.

Targets:

The draft SWMP proposes a target of increasing the regional diversion rate from a current average of 55% to 70% by 2015. This is generally in alignment with the *calculated* overall diversion rate goal (73% by 2020) resulting from GCAT's "Zero Waste" stated target of 40% reduction in materials disposed by 2020. However, it falls short in matching the underlying objectives of GCAT's target, which include:

- per capita waste diversion as the key performance metric
- waste reduction at source is the highest priority
- an explicit long range view of eventually achieving zero waste.

Governance, Roles & Responsibilities:

- There are established roles and responsibilities amongst the different levels of government with respect to waste management based on legislated authorities and regulation. These *spheres of influence* dictate which level of government is most efficient and effective with leading change.
- Solid waste management is highly integrated, involving both the public and private sectors and there is not a clear division of labour between these sectors. Business interests and activities that both sectors are involved with are highly dynamic.

Strategies & Actions:

- progressively transfer the costs and risks of managing end-of-life products away from local government and onto the producers and direct consumers of those materials
- reduce or eliminate materials entering the solid waste system which cannot be beneficially utilized, increase opportunities for reuse, and increase and expand the effectiveness of recycling programs (including recovery of organics) in all sectors
- develop and deliver education and outreach programs to all sectors, with an emphasis on the use of community based social marketing
- waste-to-energy is not limited to mass burn incineration
- use adaptive management to address evolving needs
- use performance measures