Solid Waste

Management Strategy

The Resort Municipality of Whistler | July 2, 2013



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TABLE OF CONTENTS

1.	Exe	cutive Summary	1
	1.1.	Background	1
	1.2.	Whistler's Current Solid Waste System	3
	1.3.	Recent Studies	3
	1.4.	Solid Waste Goals	3
	1.5.	Recommendations	4
	1.6.	Actions	6
2.	Bac	kground – Solid Waste Policy	7
	2.1.	Squamish Lillooet Regional District Solid Waste Management Plan	7
	2.2.	Whistler2020 – Moving Towards a Sustainable Future	7
	2.3.	RMOW Official Community Plan	8
	2.4.	RMOW Corporate Plan	8
3.	Des	cription - Whistler's Solid Waste System	9
	3.1.	Garbage	9
	3.2.	Recycling	10
	3.3.	Compost System	13
	3.4.	Depot sites – Nesters and Function Junction	15
	3.5.	Facts and Figures	16
	3.6.	Waste Disposal Alternatives	20
4.	Rec	ent Studies	21
	4.1.	Whistler Zero Waste Plan – Strategies for Garbage Reduction	22
	4.2.	Whistler Composting Operations: Cost-Benefit Study	
	4.3.	Preliminary Assessment of Biofuel Production	23
5.	Soli	id Waste Goals	23
6.	Rec	commendations	24
7.	Act	ions	26

1. EXECUTIVE SUMMARY

The attached Solid Waste Management Strategy was created to help reduce Whistler's solid waste costs primarily through increased waste diversion. The Strategy provides a list of recommendations based on recent studies and staff's analysis. Implementing the recommendations and actions will result in:

- 1. Restructuring of the municipal solid waste service agreements,
- 2. Modifications to compost infrastructure,
- 3. Updates to bylaws,
- 4. Participation in new province-wide recycling programs, and
- 5. Long-term financial reorganizing of the solid waste utility.

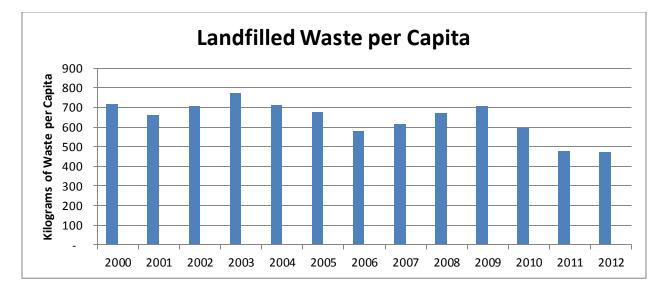
The first four recommendations will reduce annual solid waste operating costs while the fifth recommendation will be implemented over several years and will help with long-term decision making.

1.1. BACKGROUND

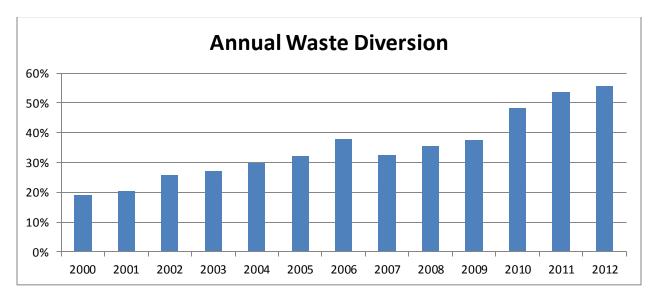
Solid waste policy and planning in Whistler is guided by several documents which articulate both regional and Whistler goals and objectives for solid waste management. The four main documents that provide guidance on solid waste issues are the Squamish Lillooet Regional District (SLRD) Solid Waste Management Plan, Whistler2020 – Moving Towards a Sustainable Future, the RMOW Official Community Plan, and the RMOW Corporate Plan.

Performance of a solid waste system is often measured by the amount per capita that is sent to landfill or by percent diversion (percentage of waste that does not go to landfill). The per capita landfilled amount is becoming the international and provincial standard for comparison between jurisdictions, it is relatively straight-forward to measure, but it is influenced by the state of the economy. In good economic times this number generally increases due to increased construction and the associated increase in overall waste generation. In 2012, Whistler sent an average of 465 kilograms per person to landfill as seen in the chart below:

Landfilled Waste per Capita



The waste diversion percentage amount is less dependent on economic factors and is a useful number to compare year-to-year in Whistler. 2012 was Whistler's best year to-date for waste diversion with 56% of the total tonnage of waste reused, recycled, and composted, with only 44% of the total going to landfill as seen in the chart below:



Whistler's Waste Diversion

1.2. WHISTLER'S CURRENT SOLID WASTE SYSTEM

A detailed description of the current solid waste system is provided in this Solid Waste Management Strategy. Knowledge of the systems for collection, transportation and processing of compost, recycling and garbage is necessary to understand how changes can be made to reduce costs and increase diversion.

Historically the RMOW has managed solid waste on an issue-by-issue basis without a broader strategy like this one. Even though the RMOW didn't have a larger strategy, we were able to accomplish a number of key successes including the closure of the Whistler Landfill to allow for Cheakamus Crossing to be built, the construction of the new transfer station, the Re-Use-it Centre, significant enhancements to the recycling program, and the Whistler Compost Facility. This approach worked well for the "low-hanging fruit" that have been available in the past, but proper management of more complex issues and systematic cost reductions require a broader strategy to be successful. At this time the RMOW's solid waste systems are in a relatively steady state and this is a good opportunity to investigate cost reductions for the solid waste system.

1.3. RECENT STUDIES

In order to prepare for potential improvements to the RMOW's solid waste system, a number of technical studies and assessments have recently been undertaken. The three recent studies that were used to develop the recommendations in this strategy are:

- Whistler Zero Waste Plan Strategies for Garbage Reduction
- Whistler Composting Operations: Cost-Benefit Study
- Preliminary Assessment of Biofuel Production

These three studies provided a range of actions for reducing costs and making progress towards our zero waste goal. The actions that had the best cost – benefit analysis have been recommended in this strategy.

1.4. SOLID WASTE GOALS

There are several high-level policy documents that discuss long-term solid waste goals and objectives, including the regional Solid Waste Management Plan, Whistler 2020, Whistler's Official Community Plan and Whistler's Corporate Plan. Setting interim goals will help Whistler reach these long-term objectives.

Using the results of the Whistler Zero Waste Plan and the Whistler Composting Operations: Cost-Benefit Study, interim goals for cost savings through increased garbage diversion and compost operation improvements have been established. The table below summarizes the diversion goals and the estimated cost savings:

	3-Year Average (2007- 2009)	2012 Actual	2014	2015	2020	2030
Garbage Reduction Goal	Baseline	30%	40%	50%	60%	80%
Tonnes Garbage Generated	18,000	12,540	10,500	9,000	7,000	3,500
Estimated tonnes / capita / year	660	465	389	333	260	130
Estimated \$ saved	na	na	\$222,000	\$350,000	\$480,000	\$735,000
Estimated Program Costs	na	na	\$50,000	\$50,000	\$50,000	\$50,000
Net Savings	na	na	\$172,000	\$300,000	\$430,000	\$685,000

Interim Garbage Reduction Goals and associated Cost Savings

The estimated savings in this table were developed assuming constant costs per tonne to process compost and recycling and dispose of garbage over the next 17 years (to 2030). Current overall costs to the RMOW are \$154 per tonne of garbage, \$143 per tonne of compost, and \$22 per tonne of recycling. The estimated savings in the table are based on shifting the specified portion of garbage into the compost and recycling streams, as well as an estimated \$88,000 per year savings from having a dry woodchip storage facility for the compost operation. These estimates are likely conservative as costs to process garbage are expected to increase in the future (due to cost of fuel increases), while there are possible cost reductions for both the compost and recycling systems

1.5. RECOMMENDATIONS

The five recommendations listed below have been developed through the recent studies and staff review of the current solid waste system. The recommended actions will result in reduced costs (as estimated above) and better management of Whistler's solid waste.

Recommendation 1: Prepare New Performance-based Solid Waste Contracts

Whistler's solid waste services are provided by the private sector through operating contracts. The current fee-for-service contracts, while relatively straight-forward to measure and administer, do not reward the contractor for progress towards RMOW financial and environmental goals. New performance-based contracts will ensure the contract is restructured in such a way that the contractor is motivated in the direction of overall cost reductions for the RMOW through improved waste diversion.

Currently, the work associated with handling and transportation of garbage and recycling at the Compactor Sites and Transfer Station is provided for under one agreement. Under the new provincial stewardship program, recycling will be paid for separately and in order to maximize the potential cost savings from the new stewardship program, the RMOW will prepare a separate recycling contract.

The scale operation at the Transfer Station, while currently part of the larger contract for handling of garbage and recycling, will be separated from the new performance-based contracts and managed directly by the RMOW. This is in accordance with best practices and will ensure consistent measurement if, under the new contracts, different contractors operate different parts of the solid waste system.

Recommendation 2: Increase the capacity of the Compost Facility to reduce overall costs.

Whistler's compost facility treats all of Whistler's biosolids (a product of the wastewater treatment process), accepts biosolids from Squamish and the SLRD, accepts commercial and residential organic waste, and handles land-clearing debris, wood waste, and clean waste lumber. It should be noted that Whistler does not have any other option for treatment of its biosolids at this time. The compost soil amendment produced by the facility is sold locally, but the revenue from the sales is quite small compared to costs to operate the compost facility and produce the compost.

A cost-benefit study of several possible changes to the compost facility was completed, and this study concluded that a building to store wood chips and keep them dry would both increase the capacity of the compost facility and reduce overall operating costs by reducing the amount of biosolids sent to landfill. Sending food waste to an alternative compost facility during times of the year when the facility is over capacity also has a positive cost-benefit for similar reasons.

A separate cost-benefit study considering the conversion of the compost facility to produce biofuel will be undertaken, now that the preliminary analysis has indicated this idea to be feasible.

Recommendation 3: Improve diversion in the commercial and multi-family sector

Sixty-two percent of the waste Whistler sends to landfill is generated by the commercial and multi-family strata housing sectors. This large segment of Whistler's waste needs to be the focus of additional diversion measures in order for Whistler to achieve its solid waste goals. Changes to the municipal Garbage Disposal and Wildlife Attractants Bylaw can provide additional incentives for diversion of organics and recyclables from this waste stream, and will allow these sectors to save money as the tipping fees for organics and recyclables are significantly lower than tipping fees for garbage. The new provincial Extended Producer Responsibility (EPR) program for Packaging and Printed Paper (PPP) is also focusing on multi-family residences for additional diversion of recyclables, and this program, beginning in May 2014 will help provide financial incentives for this sector to improve recycling rates.

Recommendation 4: Participate with new provincial Packaging and Printed Paper recycling program

Currently, most costs to collect and recycle PPP materials are paid by municipal governments. The Provincial Ministry of Environment has required producers of PPP to develop a program to collect these materials at their cost. This program will start May 19, 2014 and details of the program are being made available on an ongoing basis. A recent request for proposals for municipal governments to participate with this program has been issued, and staff will evaluate both the financial and level of service impacts of this program on the RMOW's current system.

Recommendation 5: Make the Solid Waste Utility financially independent

Like the RMOW's water and sewer utilities, the long-term financial goal for the solid waste utility is for it to be financially sustainable without supplemental funding from the General Fund. Implementing the recommendations in this report will reduce solid waste costs and help reduce the amount of supplemental funding required from the General Fund. Once the recommended changes have been implemented, solid waste finances will be review and additional changes may be required for the solid waste utility to become financially independent. Determining and establishing appropriate reserve fund contributions to ensure

long-term replacement of solid waste infrastructure will also be necessary at that time. Financial independence of the utility is important for long-term decision making.

1.6. ACTIONS

- 1. Performance-based solid waste operating contracts will be developed. These contracts will provide financial incentives for the contractor to help Whistler reduced costs and achieve our solid waste goals.
- 2. a) Staff will proceed with design and construction of a dry wood chip storage building for the compost facility. This will be done either as a capital project in the 2014 budget or as part of the new operating contract for the compost facility.

b) The alternative food waste composting facility now operating in the sea to sky corridor will be utilized to reduce costs at times of the year when the Whistler Compost Facility is over capacity. Cost reductions will be realized through reduced shipments of biosolids to landfill.

c) A cost-benefit analysis of converting the compost facility to biofuel production will be completed.

- 3. The municipal Garbage Disposal and Wildlife Attractants Bylaw will be updated to provide additional incentives for diversion of organics and recyclables from this waste stream. These changes will be implemented in conjunction with new provincial stewardship programs in May 2014 and will allow these sectors to improve diversion and reduce costs.
- 4. RMOW staff will respond to the PPP request for proposals by Sept 16, 2013. The RMOW will participate with the new program if it reduces recycling costs to the RMOW and maintains service levels for our residents. As part of this program the RMOW will be required to staff the Nesters and Function Junction depot sites. RMOW staff will also request that Whistler be included with the new PPP Streetscape collection program.
- 5. Over the next several years the contribution to the Solid Waste Utility from the General Fund will be phased out and proper levels of reserve funding will be established to ensure the long-term replacement of solid waste infrastructure

2. BACKGROUND – SOLID WASTE POLICY

Solid waste policy and planning in Whistler is guided by several documents which articulate both regional and Whistler goals and objectives for solid waste management. The four main documents that provide guidance on solid waste issues are the Squamish Lillooet Regional District (SLRD) Solid Waste Management Plan, Whistler2020 – Moving Towards a Sustainable Future, the RMOW Official Community Plan, and the RMOW Corporate Plan.

2.1. SQUAMISH LILLOOET REGIONAL DISTRICT SOLID WASTE MANAGEMENT PLAN

Approximately 20 years ago, the provincial government made regional districts responsible for solid waste planning under the Waste Management Act. The intent of the Act was to encourage municipalities to manage waste in a regional context, as opposed to every municipality working independently on waste challenges. The Act, which has now been replaced with the Environmental Management Act, was the catalyst for Whistler and other government organizations in the area, to work together and plan solid waste management in a more organized manner.

The SLRD and its member municipalities worked to complete a solid waste management plan in 1996. This plan was revised in 2007, and discussions are just beginning to update the plan again. The regional Solid Waste Management Plan (SWMP) includes elements of Whistler's local plans, provides guidance to Squamish and Whistler, and includes planning for the services provided by the SLRD at the Lillooet Landfill and the transfer stations located at Pemberton, Goldbridge, Devine, Britannia Beach, and Furry Creek.

Despite not providing solid waste services in Whistler or Squamish, the SLRD funds their planning and administration for solid waste primarily through per tonne fees collected from the Whistler Transfer Station and the Squamish Landfill.

The regional SWMP encourages communities in the area to work together on solid waste issues, but the RMOW, not the SLRD, has independent authority, through Council and the Solid Waste Utility, to provide solid waste services to the public in Whistler.

While the SLRD's SWMP has a regional focus, there are sections which address waste diversion and disposal in Whistler. These sections have been considered in the preparation of Whistler's Solid Waste Management Strategy.

Included in the current SWMP is a 2013 regional target of 394 kg per capita per year for waste disposed to landfill.

2.2. WHISTLER2020 - MOVING TOWARDS A SUSTAINABLE FUTURE

Whistler2020 also establishes a goal of zero waste for the Resort Community. Whistler 2020 defines zero waste as "an aspirational goal where all outputs, currently referred to as 'waste', are used as inputs for another process."

Whistler2020 includes a "description of success" for solid waste management, as noted below.

In 2020, Whistler's material flows are managed in a comprehensive, convenient and upstream way, and the resort community is well on its way to embracing the concept of a 'zero waste' society. In the future:

- The resort community is clean and well maintained
- Whistler offers the same or higher quality service using less materials than in the past
- Whistler is using durable materials that are less environmentally harmful, preferring recycled, natural and sustainably harvested materials, and plentiful metals
- The resort community is 'closing the loop' by providing appropriate and convenient opportunities for reducing, reusing and recycling materials
- Whistler is well on its way to achieving its 'zero waste' goal
- Increased business performance and economic opportunities are being realized as a result of smart materials management
- The community is committed to providing infrastructure capable of continually decreasing our residual wastes
- Local businesses, residents and visitors are knowledgeable about material flows, and demonstrate a strong ethic of responsibility and stewardship toward resources and materials
- Substances and chemicals that are harmful to human health are being eliminated, replaced, or managed in a way that they do not disperse in nature
- Partnerships are developed such that collective procurement choices favour companies and suppliers that are consistent with our identified materials and solid waste values

Whistler 2020 has provided a reference point for solid waste planning since its adoption in 2007, and any actions on solid waste are considered in the context of whether those actions move us towards or away from the "description of success".

2.3. RMOWOFFICIAL COMMUNITY PLAN

The Official Community Plan (OCP) is one of the RMOW's highest and most important policy documents for guiding land development decision making. The OCP has a number of goals and objectives related to solid waste and the key directions are shown below:

- Move progressively toward zero solid waste in a cost-effective, efficient and environmentally sound manner.
- Operate and encourage the private sector to participate in innovative, costeffective and environmentally sustainable solid waste and recycling programs in support of achieving our zero waste goal.

The OCP states that continual innovation in solid waste treatment as well as aggressive composting and recycling programs will ensure that Whistler's zero waste goals will be met and sustained.

2.4. RMOWCORPORATE PLAN

The RMOW's Corporate Plan has identified goals to support our community priorities. Several Corporate Strategies have been developed to move towards these goals, and three of the strategies relate directly to this Solid Waste Management Strategy:

- Maintain strategic, prudent and efficient financial management policies
- Demonstrate excellence in the delivery of core municipal infrastructure services
- Improve client service delivery across all municipal functions.

Specific actions have been identified in the field of Solid Waste to ensure we deliver on these strategies. The list of Solid Waste actions identified in the Corporate Plan are as follows:

- Support the updated Solid Waste Management Plan
- Implement the recommendations of the composter operations analysis costbenefit study
- Implement the recommendations of the solid waste diversion enhancement (zerowaste) study
- Overhaul and renew the solid waste management contract structure
- Update contracts with solid waste diversion partners (Re-Use-It and Whistler bottle depot)
- Continue to increase public participation in solid waste outreach programs (free yard waste drop off day, and pitch in day)
- Evaluate innovative outreach programs that will further improve solid waste diversion
- Continue to operate the innovative composting facility that serves the entire region with solid waste diversion and provides an excellent soil amendment
- Implement the heat recovery system at the Compost facility
- Implement a star-screen system to reduce trucking costs
- Continue to explore ways to allow those using preferred modes of transportation to have a suitable level of access to solid waste facilities

Three of these actions have already been completed, two of the actions are ongoing (by their nature), and this Solid Waste Management Strategy addresses how to move forward with the remaining actions.

3. DESCRIPTION - WHISTLER'S SOLID WASTE SYSTEM

3.1. GARBAGE

The RMOW operates and maintains two depot locations where residents can drop off their domestic garbage, and owns and operates the Waste Transfer Station in the Callaghan Valley, where both domestic and commercial garbage is accepted. Every owner of a commercial, industrial, institutional, and tourist accommodation building is required to provide a wildlife-proof garbage storage site by the Garbage Disposal and Wildlife Attractants Bylaw and these commercial operations contract private waste haulers to pick-up garbage from their site and take it to the Transfer Station. All garbage brought to the Transfer Station is tipped onto the floor, clean wood suitable for the composting process is sorted out when possible, and the garbage is placed into containers by an excavator for shipment to landfill. The following flow diagram shows how garbage is handled in the RMOW.

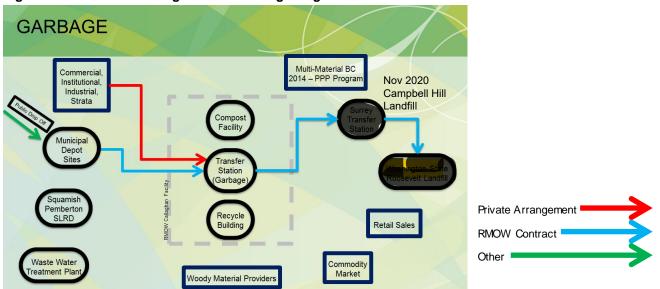


Figure 1 - Material flow diagram for RMOW garbage

Garbage Disposal Costs

When Whistler closed its landfill in 2006 there were limited options for waste disposal. There are still very few options for waste disposal due to the limited number of landfills and waste-to-energy facilities within a reasonable distance of Whistler and it is unlikely that disposal costs will decrease in the short term. A complete description of garbage disposal options is found later in Section 3.6 of this report.

Financial Considerations

The cost to operate the garbage collection and disposal system for the RMOW is approximately \$1.9 million annually, resulting in a cost of \$154 per tonne of garbage in 2012. Funding for the garbage operations is collected through a combination of municipal taxes, the garbage / recycling municipal user fees, and tipping fees. Tipping fees for garbage are currently set at \$120 per tonne.

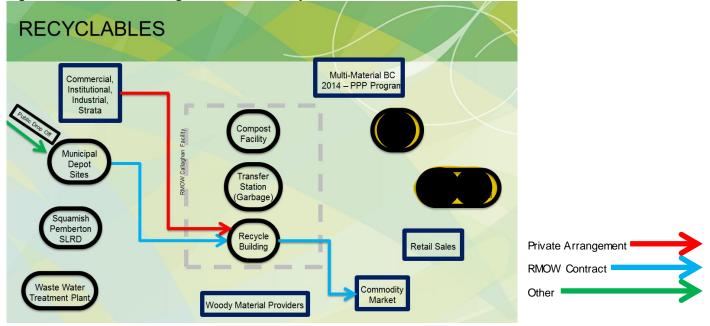
The agreement to operate and maintain the Transfer Station and scale, and provide garbage collection services from the depot sites was negotiated with a contractor on a sole-source basis. As part of the agreement, the contractor is responsible for maintaining the Transfer Station site, weighing materials in and out of the facility, and transporting waste and recycling materials to off-site locations.

Under the current agreement the contractor must provide the required services, and is paid on a per tonne basis for handling garbage. While this contract is simple to administer, it does not reward the contractor for progress towards the RMOW's goals of reducing solid waste costs and increasing diversion.

3.2. RECYCLING

Residential recycling facilities are available at the Nesters and Function Junction Depot sites. The operation and maintenance of these sites is also contracted to the private sector as part of the contract for handling of garbage. Under the terms of this agreement, the contractor is responsible for providing, maintaining and servicing the recycling containers at the Nesters and Function Junction depot sites. Once the recyclable

material is deposited into a container, the contractor is responsible to collect the material and provide any necessary processing and transportation in order to sell the material to available commodity markets. The contractor owns the proceeds from selling the material, but also accepts the risks of market fluctuations. The contractor uses the Recycle Building at the Transfer Station as a staging area prior to transport to the commodity markets for most of the recyclable material. The following diagram shows the movement of recyclables through the RMOW system.





Commercial and Multi-Family recycling

While many commercial and multi-family residential buildings do have private contracts for recycling collection, some of these building still do not have full recycling facilities despite the existing tipping fee structure at the Transfer Station which provides motivation to recycle as much as possible as recyclables are free and garbage costs \$120 per tonne. Changing the Garbage Disposal and Wildlife Attractants bylaw to require recycling facilities as well as garbage facilities at these types of buildings will increase diversion, and potentially save money for the owners of these buildings. This sector is generally responsive to economic factors so the bylaw changes implemented in conjunction with a promotion and education program has the potential to achieve a major reduction in garbage and the associated costs for Whistler's commercial and multi-family residential sector. Making this shift at the same time that the new province-wide packaging and printed paper recycling program begins to offer further financial incentives for the multi-family residential sector to recycle will make this transition easier.

Province-wide Packaging and Printed Paper recycling program

Multi-Material BC is a not-for-profit agency established under the BC Society's Act. It was created in response to the Provincial government's requirement for producers of Packaging and Printed Paper (PPP)

to implement stewardship programs by May 19, 2014. The provincial government has mandated that this program achieve at least a 75% recovery rate of the PPP material.

The stewardship plan developed by MMBC has recently been accepted by the Province and announcements of the plan details will be ongoing over the next few months. RMOW staff are following the developments closely, and are planning to position the RMOW to take the most advantage of this new opportunity. One of MMBC's requirements for depot collection systems, like we have in Whistler, is for each depot to be staffed. If the financial incentive to participate in the MMBC program is adequate, this will be the catalyst for having an attendant at the Nesters and Function Junction depots beginning in May 2014. This change would potentially enable the RMOW to offer additional solid waste collection services and manage concerns about non-residential use of the depot facilities.

Currently recycling is included as part of the contract for handling of Whistler's garbage, but it will be tendered as a separate contract to facilitate participation with the PPP stewardship program.

Recycling Partners

The recycling program in Whistler also benefits from the RMOW partnering with the Re-Use-It Centre and the Whistler Bottle Depot. These reuse and recycling operations are located on RMOW property and provide significant services for Whistler residents at no cost to the Whistler taxpayers.

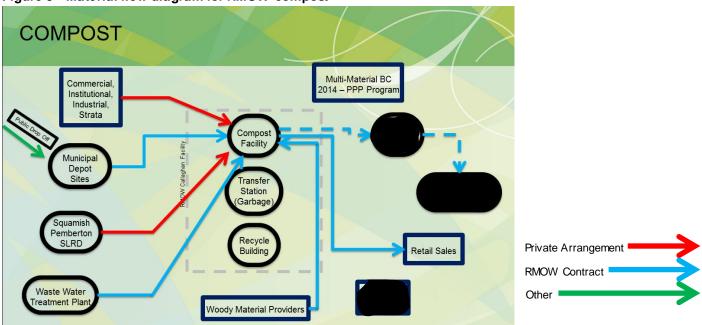
Financial Considerations

The cost to operate the recycling system at the two depot sites is approximately \$145,000 annually. Funding for the depot sites is collected through a residential parcel tax and no tipping fees are charged per tonne of recyclables.

Due to significant recycling programs that happen without RMOW funding (the Re-Use-It and Re-Build-It Centres, the bottle depot, and commercial and strata recycling contracts), the RMOW pays only \$22 per tonne of recyclables collected in Whistler.

3.3. COMPOST SYSTEM

The RMOW operates and maintains an enclosed composting system at the Transfer Station located in the Callaghan Valley. This facility accepts biosolids from Whistler's wastewater treatment plant and other regional wastewater treatment plants, food waste, yard debris and wood waste, and produces a compost product that is sold as a soil amendment. Residential food waste bins are provided at the Nesters and Function Junction Depot sites for residents. All the operation and maintenance of this system is contracted to the private sector. The diagram below shows how compostable material is handled in the RMOW.





Background

The rationale for purchasing and constructing the Whistler Compost Facility in the Callaghan Valley is well documented in several Council reports. In summary, the facility was originally built in Squamish and, for various reasons, was shut down after a few years of operation. The RMOW purchased the equipment for about half the original price and relocated it to Whistler to process biosolids from the wastewater treatment plant and allow for increased diversion of organics from Whistler's garbage. During the recent upgrade to Whistler's Wastewater Treatment Plant it was decided to rely on the compost system rather than build new digesters for treatment of biosolids. Whistler does not have any other option for treatment of its biosolids at this time. While Whistler does have a temporary permit to landfill excess biosolids with our garbage, this permit may not be renewed in the future, and it is specifically only for excess amounts that are generated during peak seasons. This landfilling of biosolids is also an extra cost to the compost system.

The facility commenced operation in late 2008 and the RMOW retained Carney's Waste Systems, on a sole-source basis, to operate the Whistler Compost Facility because they were the operator when it was located in Squamish and had experience with the system. Additionally, Carney's had the contract to operate the Transfer Station, which allowed for sharing of equipment and staff on the site.

The Whistler Compost Facility can accept more variety of materials than most composting systems due to the temperature controlled in-vessel system that is used. With this system anything organic will break down and is effectively pasteurized during the two week process due to the high temperatures achieved in the composting tunnels. This is important in Whistler as the material produced after two weeks in the compost tunnels does not attract bears or other animals. Since start-up in 2008, the facility has been a huge success in terms of waste diversion. In 2012, the Whistler Compost Facility accepted almost 13,000 tonnes of food waste, biosolids and wood waste. This is slightly more than the amount of material that Whistler sent to landfill in 2012.

The raw compost material that is discharged from the Whistler Compost Facility must be "cured" for approximately three months before is ready to use. Under the existing contract, the compost is trucked to Squamish for curing and is mixed with sand to produce a high quality soil amendment that is suitable for most gardening, landscaping and agricultural uses.

Compost Sales

Compost is produced by local governments or their contractors in several areas in BC including Metro Vancouver. The compost produced in Metro Vancouver benefits from economies of scale, so competes locally with the Whistler product, despite the additional trucking costs to bring the material from the lower mainland. Currently everything produced by the Whistler Compost Facility is sold at approximately \$35 per cubic yard, but the cost associated with curing, screening and mixing the compost with sand to produce a saleable product are nearly equal to the \$35 per yard price.

Composting Alternatives

In many regions backyard composting is promoted as a good waste diversion option, but due to challenges with wildlife and climate this is not a good option for Whistler.

A second composting facility is now in operation in the SLRD. This compost facility is focusing on food waste and may become a helpful alternative for residential organics during peak periods when the Whistler Compost Facility is at capacity. While diverting food waste to this facility during specific portions of the year may be beneficial, staff do not recommend a bylaw to ban food waste from the Whistler Compost Facility as requested by the operators of the new compost facility.

Financial Considerations

The annual operating cost of the Whistler Compost Facility is approximately \$1.7 million. In addition, there is a further \$80,000 in annual payments for the loan that is associated with the purchase of the in-vessel compost system. This total amount of \$1.8 million equates to a cost per tonne of \$143, which is less than the total costs per tonne to dispose of garbage. Further reducing the costs to operate the composter will help widen the difference between compost and garbage costs per tonne and will improve the financial incentive for diversion of organics from the garbage.

The compost budget is funded from the Composter Municipal User Fee (\$102 per parcel) collected with property taxes and through tipping fees. The RMOW charges different tipping fees for different compostable materials. Rates are set at \$75 per tonne for organics, \$110 for biosolids, \$30 for clean wood waste, and wood chips are accepted free of charge. Approximately \$370,000 in tipping fees are received

from external sources, plus an additional \$360,000 is internally transferred from the Sewer Utility to the Solid Waste Utility for processing of biosolids.

The \$75 tipping fee charged for food waste at the Whistler Compost Facility is significantly lower than the garbage tipping fees of \$120 per tonne in order to encourage diversion of organic material.

In comparison with other communities, the \$75 rate is slightly higher than rates in Metro Vancouver which suggests there is little room to increase tipping fees for organics in Whistler.

3.4. DEPOT SITES – NESTERS AND FUNCTION JUNCTION

As described in the garbage, recycling, and compost sections of the solid waste system description, the RMOW operates and maintains two depot sites through contracted services. In addition to the items that are collected at these sites every day, there are also annual events to collect items such as Christmas trees and yard waste.

Non-Residential Use of Depot Sites

The depot sites are funded through a garbage / recycling municipal user fee collected as part of the residential property taxes and commercial properties who have their own garbage collection services are not charged.

Staff are aware that some contractors use the depot sites for commercial garbage, which contravenes the RMOW's Garbage Disposal and Wildlife Attractants Bylaw. These users do not contribute financially to Whistler's residential waste program.

Staff have estimated the cost of this unauthorized use of the facilities at \$72,000 per year (based on lost tipping fees that should have been paid by the commercial users). Staffing the depots to eliminate this unauthorized use is expected to cost more than would be saved, so until now this issue has not been addressed. Staffing the depots to meet the requirements of the new PPP recycling program will have the added benefit of reducing this problem.

Fortis Gas Property

The RMOW recently purchased the Fortis Gas property adjacent to the Nesters depot site. Plans for use of this site, including a potentially larger and updated compost, recycling, and garbage depot facility among other uses will be explored in late 2013.

Neighborhood Pick-up

Some residents have suggested that neighborhood waste containers would benefit residents without vehicles. Exploring ways to allow those using preferred modes of transportation to have a suitable level of access to waste facilities is also an action in our Corporate Plan. In the past, two alternative residential waste collection services have been discussed involving bear-proof bins for compost, recycling, and garbage either at permanent locations every block or two in the neighborhoods throughout Whistler, or a mobile system where a trailer would be temporarily positioned in a neighbourhood on a particular day of the week. A system of permanent neighbourhood bins has been utilized in Banff and Jasper for many years.

Installing permanent neighborhood compost, recycling, and garbage containers is expected to have siting challenges as there was a significant outcry from the public many years ago when neighborhood postal kiosks were installed in Whistler and staff expect there would be even stronger opposition to neighborhood waste collection sites in residential areas.

While staff intend to complete the corporate plan action item later in 2013, there are several companies that offer a partial solution through household collection services. These companies recognize there is a market for garbage collection and are available to collect residential waste on an "as-needed" basis.

3.5. FACTS AND FIGURES

Waste Measurement

A general principal of good management is that you must be able to measure a system before you can manage it properly. Performance of a solid waste system is often measured by the amount per capita that is sent to landfill or by percent diversion (percentage of waste that does not go to landfill), and these two different measures tell slightly different stories. The per capita landfilled amount is becoming the international and provincial standard for comparison between jurisdictions, it is relatively straight-forward to measure, but it is influenced by the state of the economy. In good economic times this number generally increases due to increased construction and the associated increase in waste generation. The waste diversion percentage amount is less dependent on economic factors, is a useful number to compare year-to-year in Whistler, but can be influenced by policy changes.

In 2012, Whistler sent an average of 465 kilograms per person to landfill. This was calculated by taking the total tonnage of garbage sent to landfill (12,869 tonnes) and dividing by the population equivalent (27,208 people). While this is higher than the region-wide goal of 394 kilograms per person per year, the trend has been going in the right direction as shown in Figure 4 below:

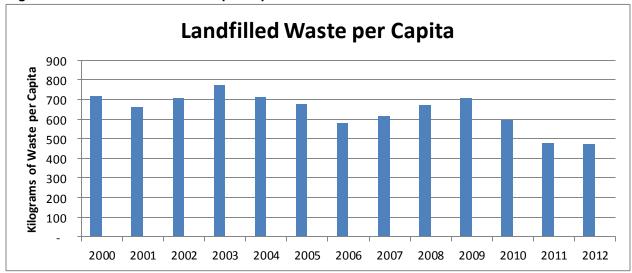


Figure 4 - Annual landfilled waste per capita

2012 was Whistler's best year to-date for waste diversion with 56% of the total tonnage of waste reused, recycled, and composted, and only 44% of the total going to landfill. Whistler's diversion rate has increase

significantly in recent years, at least in part due to a burning ban which has driven many tonnes of wood waste to our compost system. Much of this wood was burned in the past, and did not become part of our waste stream. This policy decision has improved Whistler's air quality and helped increase waste diversion. The increasing trend in Whistler's waste diversion can be seen in the figure below:

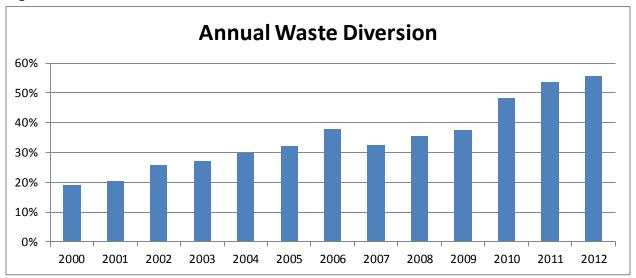


Figure 5 - Whistler's Waste Diversion

A thorough waste composition study was conducted at the Whistler landfill in 2004 and more recent studies have been done at the Whistler Transfer Station in 2011 and 2012. These studies have indicated that the largest components of waste disposed in Whistler are: compostables (25%), paper products (17%), wood waste (16%), plastics (8%) and metal (8%). These results are similar to other municipalities in British Columbia. This study indicates that 41% of Whistler's garbage could be diverted to the compost facility, and another 40% could be recycled. These significant diversion opportunities can be seen in the figure below:

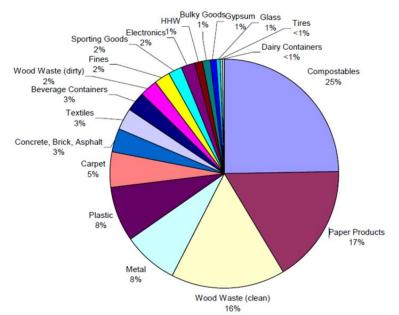
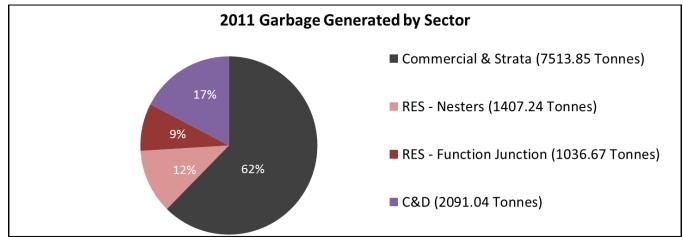


Figure 6 – Composition of Whistler's Garbage

The waste composition study also investigated which sectors were generating the most garbage in Whistler. This is useful information when deciding where to focus efforts for waste diversion improvements. The following results show that the Commercial and Strata sectors in Whistler generate the highest percentage of the total amount of garbage:





Costs

The RMOW's annual costs for operating the solid waste utility have increased since the closure of Whistler's landfill in 2006, but the most recent three-year trend is decreasing costs as shown in Figure 8 below. Recent solid waste studies and staff's evaluation of the current operating systems indicates that there are further opportunities for cost reduction.

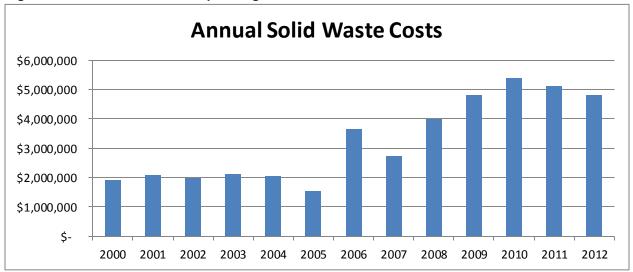


Figure 8 - Annual Solid Waste Operating Costs

Whistler's annual solid waste operating costs total approximately \$4.1 million with an additional \$848,000 in debt services and repayment and a \$150,000 contribution to Capital Reserves. Of the operating costs, approximately \$1.8 million goes to operating the compost system, \$145,000 for residential recycling, \$1.9 million spent on garbage handling and disposal, and approximately \$250,000 for overhead, SLRD fees, staff, drywall recycling, landfill maintenance, and snow clearing.

Solid Waste revenues match overall costs with \$2.04 million in user fees (collected as part of property taxes), approximately \$1.75 million in tipping fees, \$660,000 in internal tipping fees (from depot sites and the wastewater treatment plant), and an approximately \$600,000 transfer from the General Fund.

The staff payroll for Solid Waste includes only 0.83 full-time equivalents (FTE) and staff are mostly responsible for contract administration, as virtually all of the municipal services are provided by contractors.

Figure 9 - Solid Waste Utility Expenses and Revenues (2012)

Operating Expenses					
Solid Waste - General (overhead, SLRD fees, staff, drywall recycling)	\$182,000				
Landfill Post Closure Care	\$26,000				
Nesters Compactor Site	\$296,000				
Function Junction Compactor Site	\$220,000				
Transfer Station Operations	\$417,000				
Transportation of Waste to Surrey	\$366,000				
Solid Waste Disposal (includes transportation from Surrey to landfill)	\$737,000				
Compost Facility	\$1,811,000				

	Sub-Total	\$4,055,000			
	Debt Service Interest & Capital	\$848,000			
	Contribution to Capital Reserve	\$150,000			
	Total	\$5,053,000			
Oper	ating Revenues				
	Garbage / Recycling User Fees (taxes)	\$640,000			
	Composter User Fees (taxes)	\$1,400,000			
	Garbage Tipping Fees	\$1,378,000			
	Compost Tipping Fees	\$371,000			
	Depot Site Tipping Fees (internal)	\$297,000			
	WWTP Tipping Fees (biosolids)	\$362,000			
	Transfer from General Fund	\$605,000			
	Total	\$5,053,000			

3.6. WASTE DISPOSAL ALTERNATIVES

There have been significant changes to Whistler's solid waste systems over the past few years. Most notably, the closure of the Whistler Landfill was accelerated due to construction of a new Whistler neighbourhood and a new Transfer Station was constructed in 2008 to export waste.

The original waste export preference was to utilize Metro Vancouver's landfill at Cache Creek, however, this facility was reaching its capacity and the permit to expand was not authorized by the provincial government. With no other reasonable options, Whistler negotiated a contract to transport its waste to the Roosevelt Regional landfill in Washington State.

Metro Vancouver

When the Whistler Landfill was closed, the preferred waste disposal option was to dispose of waste through Metro Vancouver's system. At that time, the proposed expansion of the Cache Creek Landfill was rejected and Metro Vancouver decided that they were not in a position to accept additional waste from communities outside the region. Given this, the RMOW negotiated the contract with Regional Disposal Company.

Metro Vancouver has now decided to expand its waste-to-energy facilities and a new facility is expected to be online in 2018. The RMOW will consider participating with this new disposal alternative as details become available.

Squamish Landfill

The 2007 SLRD Solid Waste Management Plan (SWMP) states that the Squamish Landfill will be expanded in four phases to become the regional landfill for the area and that Whistler will dispose of waste at the Squamish Landfill when an Operational Certificate (OC) is issued for the facility. This direction in the SWMP was based on the assumption that this would be the lowest cost option for disposal of garbage.

More recent discussions with the District of Squamish suggest that it is likely that only the first phase of the landfill expansion will be approved and there may not be sufficient capacity for Whistler's waste at the Squamish Landfill. If the Squamish landfill is developed further in the future, it may become an option for disposal of Whistler's garbage.

Cache Creek Landfill – Belkorp Environmental Services

Belkorp Environmental Services, the operators of the Cache Creek landfill, have an exclusive contract with Metro Vancouver until 2018, but plan to continue operating the landfill after the contract with Metro Vancouver is completed. Using the Cache Creek landfill for Whistler's garbage may become an option in the future and staff will investigate this possibility when it becomes available.

Roosevelt Regional Landfill

Regional Disposal Company, a subsidiary of Allied Waste Services, operates a very large scale landfill in south-eastern Washington State. This landfill is well engineered and managed to minimize its environmental footprint. The landfill is located in a very dry climate which minimizes leachate generation, it has a double liner with leak detection between the two liners, and the landfill has a significant methane collection system that is utilized to produce enough electricity to power approximately 20,000 homes. Since the closure of the Whistler landfill in 2006, Whistler has trucked garbage to Surrey where a very large forklift stacks containers of garbage two-high on rail cars, which are then sent to the Roosevelt Regional landfill. The existing contract expires on November 1, 2020. Whistler can continue to utilize this facility, or if another option becomes more cost-effective, then the RMOW can provide six months notice to terminate the contract. Staff will investigate alternatives as they become available.

4. RECENT STUDIES

Historically the RMOW has managed solid waste on an issue-by-issue basis without a broader strategy like this one. Even though the RMOW didn't have a larger strategy, we were able to accomplish a number of key successes including the closure of the Whistler Landfill to allow for Cheakamus Crossing to be built, the construction of the new transfer station, the Re-Use-it Centre, significant enhancements to the recycling program, and the Whistler Compost Facility. This approach worked well for the low-hanging fruit that have been available in the past, but more complex issues require a strategy.

In order to accomplish the results of the past few years, the municipality executed many construction contracts and service agreements to build and operate infrastructure. These agreements and infrastructure have allowed both the RMOW and the private sector to provide improved solid waste services. Most of the service agreements have been in place for about 5 years and staff have recently started to review opportunities to reduce costs and to enhance services further.

In order to prepare for potential improvements to the RMOW's solid waste system, a number of technical studies and assessments have recently been undertaken, as described below. Elements of these reports are integrated throughout the management strategy.

4.1. WHISTLER ZERO WASTE PLAN - STRATEGIES FOR GARBAGE REDUCTION

EBA Engineering Consultants Ltd. completed a Zero Waste Plan for the RMOW in November 2012. This report examines opportunities to increase waste diversion and to move the community toward its goal of zero waste by providing a high level review of all Whistler's solid waste systems.

The scope of this study includes reduction of waste and greenhouse gas emissions in a financially responsible manner. The report has valuable information regarding Whistler's solid waste composition and sources. Three scenarios: advanced, moderate, and minimal strategies were developed and a triple-bottom-line analysis for economic, environmental, and social effects was performed on the three strategies. Weighting for the triple bottom line analysis was developed with the consultants and staff, and economic effects were given the highest weighting of the three. This analysis was performed at a high level, but the "advanced" strategies came out with the highest overall score.

Based on this analysis, the report recommended many actions to reduce costs through improved diversion, and several of these actions can be implemented in 2013 and 2014:

- 1. Establish clear goals and targets for waste diversion (as shown in Section 5 of this report).
- Adjust Garbage Disposal and Wildlife attractants bylaw to improve waste diversion and reduce costs to users.
- 3. Develop a consistent look and messaging for Whistler's streetscape bin system.
- 4. Revise operating contracts to ensure incentives are in place for garbage reduction.
- 5. The Transfer Station scale should be staffed by the RMOW or contracted to a third party so there is independent monitoring of the amounts of compost, recyclables, and garbage for billing purposes.

4.2. WHISTLER COMPOSTING OPERATIONS: COST-BENEFIT STUDY

Conestoga-Rovers & Associates completed a Cost-benefit study for the Whistler Compost Facility in December 2012.

This report evaluated the costs and benefits of several infrastructure upgrades to the Compost Facility. Opportunities to streamline the operations were examined, and revenue sources (tipping fees) were reviewed. Greenhouse gas emissions associated with the compost operation were evaluated as part of the cost / benefit analysis of the various options.

The report concluded that the capacity of the composter is limited in the winter due to the moisture levels is the available woodchips. To improve year-round capacity and reduce the costs of purchasing woodchips and sending biosolids to landfill, a shelter to provide dry woodchip storage should be constructed. The preliminary financial analysis indicated an eight-year simple payback period for the woodchip shelter, but further conversations with the operating contractor concluded that it may be possible to significantly reduce the costs associated with the structure and may result in a four-year simple payback or an annual return on investment of 25%. A net annual operating savings of \$88,000 per year is estimated for the construction of the woodchip shelter.

The report also suggested that there could be a cost benefit to utilizing the new alternative compost operation in the SLRD at times when the Whistler Compost Facility is at capacity. Any reduction of the amount of biosolids that is sent to landfill will be a direct savings to the compost operation. This option will be included in the new compost contract that is being developed. A net annual operating savings of \$17,000 per year was estimated for this operational change.

Several other options were evaluated in the report, but all of these options had longer payback periods and will not be considered until the more cost-effective improvements are implemented.

The report also recommends adjustments to the municipal user fee and the tipping fees to better align with current actual costs. These recommendations will be reviewed again once a new compost operating contract is in place and the cost savings from the dry wood storage building and use of the alternative compost facility are being realized (probably in 2015).

4.3. PRELIMINARY ASSESSMENT OF BIOFUEL PRODUCTION

This report, completed by Morrison Hershfield Limited on March 26, 2013, examines the potential conversion of the composting tunnels in order to produce biofuel. The conversion could involve the installation of several high intensity air heaters to accelerate the drying process in the tunnels and produce a low moisture product that could be sold as biofuel to several industries that require this input. This option is interesting as it has the potential to increase the capacity of the composting system, reduce operating costs, and increase the value of the end product.

Metro Vancouver has recently taken steps to dramatically increase the amount of composting in the Lower Mainland and an independently operated compost facility has recently opened in the Sea to Sky corridor. These developments may drive the price of compost material down as the supply increases. While it is currently possible to sell all the compost that is produced by the Whistler Compost Facility at approximately \$35 per cubic yard it is uncertain if it will be possible to sell the product at this price in the future. While many other locations can produce compost, Whistler is in a somewhat unique position with the in-vessel composting system that could be modified to produce biofuel.

Concerns regarding this option include provincial approvals, capital and operating costs, and the limited market for biofuel.

The report concludes that the preliminary data looks positive and further evaluation is currently underway to assess market demand, examine some technical issues, and confirm the business case.

5. SOLID WASTE GOALS

There are several high-level policy documents that discuss long-term solid waste goals and objectives, including the regional Solid Waste Management Plan, Whistler's Official Community Plan and the Whistler2020 strategy. Setting interim goals is a good way to help Whistler reach these long-term objectives.

Using the results of the Whistler Zero Waste Plan and the Whistler Composting Operations: Cost-Benefit Study the following interim goals for cost savings through increased garbage diversion and compost operation improvements have been established:

	3-Year Average (2007- 2009)	2012 Actual	2014	2015	2020	2030
Garbage Reduction Goal	Baseline	30%	40%	50%	60%	80%
Tonnes Garbage Generated	18,000	12,540	10,500	9,000	7,000	3,500
Estimated tonnes / capita / year	660	465	389	333	260	130
Estimated \$ saved	na	na	\$222,000	\$350,000	\$480,000	\$735,000
Estimated Program Costs	na	na	\$50,000	\$50,000	\$50,000	\$50,000
Net Annual Savings	na	na	\$172,000	\$300,000	\$430,000	\$685,000

Figure 10 - Interim Garbage Reduction Goals and Associated Cost Savings

The estimated savings in this table were developed assuming constant costs per tonne to process compost and recycling and dispose of garbage over the next 17 years (to 2030). Current overall costs to the RMOW are \$154 per tonne of garbage, \$143 per tonne of compost, and \$22 per tonne of recycling. The estimated savings in the table are based on shifting the specified portion of garbage into the compost and recycling streams, as well as an estimated \$88,000 per year savings from having a dry woodchip storage facility for the compost operation. These estimates are likely conservative as costs to process garbage are expected to increase in the future (due to cost of fuel increases), while there are possible cost reductions for both the compost and recycling systems

6. RECOMMENDATIONS

The four guiding documents described in Section 2 of this report explain overarching solid waste goals and a vision of success. This Solid Waste Management Strategy compliments and supports these documents, and will work towards achieving the cost reduction goals described above by providing a clear set of actions to increase waste diversion.

The five recommendations listed below have been developed through the recent studies and staff review of the current solid waste system. The recommended actions will result in reduced costs (as estimated in Figure 10) and better management of Whistler's solid waste.

Recommendation 1: Prepare New Performance-based Solid Waste Contracts

Whistler's solid waste services are provided by the private sector through operating contracts. The current fee-for-service contracts, while relatively straight-forward to measure and administer, do not reward the contractor for progress towards RMOW financial and environmental goals. New performance-based contracts will ensure the contract is restructured in such a way that the contractor is motivated in the direction of overall cost reductions for the RMOW through improved waste diversion.

Currently, the work associated with handling and transportation of garbage and recycling at the Compactor Sites and Transfer Station is provided for under one agreement. Under the new provincial stewardship program, recycling will be paid for separately and in order to maximize the potential cost savings from the new stewardship program, the RMOW will prepare a separate recycling contract. The scale operation at the Transfer Station, while currently part of the larger contract for handling of garbage and recycling, will be separated from the new performance-based contracts and managed directly by the RMOW. This is in accordance with best practices and will ensure consistent measurement if, under the new contracts, different contractors operate different parts of the solid waste system.

There are several options for solid waste agreements that are currently being evaluated, but it is likely that a slightly different breakdown of contracted services will be the preferred option. A public request for proposals (RFP) will be issued for several contract packages in order to get the best balance of service and cost for Whistler's taxpayers. The District of Squamish is also considering new solid waste contracts and it may be possible to create a more competitive environment by attracting more interest from solid waste companies based in Metro Vancouver if both organizations issue RFPs for this work on a similar timeline.

A dedicated solid waste coordinator for a one year term could reduce the RMOW's costs by assisting with a well-managed transition to performance-based contracts for solid waste services. This option will be evaluated on a cost / benefit basis and it is possible that a temporary solid waste coordinator could be appointed within the existing staff resources.

Recommendation 2: Increase the capacity of the Compost Facility to reduce overall costs

The cost per tonne of material processed at the Whistler Compost Facility is a concern simply from a cost perspective, but also as it acts as a barrier to increasing diversion of organic material from Whistler's garbage which will result in long-term cost savings. The capacity of the composter is limited due to high moisture levels in the woodchips (especially in winter), and this results in additional disposal costs when excess biosolids must be shipped to landfill.

A cost-benefit study of several possible changes to the compost facility was completed, and this study concluded that a building to store wood chips and keep them dry would result in reduced shipments of excess biosolids and reduced operating costs. Utilizing the alternative food waste composting facility that is now in operation in the Sea to Sky corridor at certain times of the year would also result in reduced shipments of biosolids to landfill and reduced operating costs.

The potential to upgrade the Whistler Compost Facility to produce a biofuel is also interesting as it could increase the capacity of the facility, reduce or eliminate the costs involved with curing of the compost, and eliminate the costs required to produce the saleable end product. Further study will be undertaken to produce a business case for this idea.

Recommendation 3: Improve diversion in the commercial and multi-family sector

Sixty-two percent of the waste Whistler sends to landfill is generated by the commercial and multi-family strata housing sectors. This large segment of Whistler's waste needs to be the focus of additional diversion measures in order for Whistler to achieve reduced solid waste costs. Changes to the municipal Garbage Disposal and Wildlife Attractants Bylaw can provide additional incentives for diversion of organics and recyclables from this waste stream, and if implemented properly will allow these sectors to save money as the tipping fees for organics and recyclables are significantly lower than tipping fees for garbage. The new provincial Extended Producer Responsibility (EPR) program for packaging and printed paper (PPP) is also targeting multi-family residences for additional diversion of recyclables, and this program, beginning in May 2014 will help provide financial incentives for this sector to improve recycling rates.

Recommendation 4: Participate with new provincial Packaging and Printed Paper recycling program

Currently, most costs to collect and recycle packaging and printed paper are paid by municipal governments. To change this situation, the Provincial Ministry of Environment has required producers of Packaging and Printer Paper (PPP) to develop a program to collect PPP at their cost. This program will start May 19, 2014 and details of the program are being made available on an ongoing basis. A recent request for proposals for municipal governments to participate with this program has been issued, and staff intend to participate with this program, but will evaluate both the financial and level of service impacts of this program on the RMOW's current system to ensure it is acceptable.

This new program requires recycling depots to be staffed and the RMOW will take this step for the Nesters and Function Junction sites next May when this program is initiated. With a staffed site, the RMOW will be able to provide an increased level of service to residents using these depots and further waste diversion opportunities are expected.

This new stewardship program has not included Whistler as part of its streetscape collection program due to our small resident population, but based on our population equivalent from tourist visits, Whistler should be included. Staff will send a request to the stewardship program to have Whistler included in the program.

Recommendation 5: Make the Solid Waste Utility financially independent

Like the RMOW's water and sewer utilities, the long-term financial goal for the solid waste utility is for it to be financially sustainable without supplemental funding from the General Fund. Implementing the recommendations in this report will reduce solid waste costs and help reduce the amount of supplemental funding required from the General Fund. Once the recommended changes have been implemented, solid waste finances will be reviewed and additional changes may be required for the solid waste utility to become financially independent. Determining and establishing appropriate reserve fund contributions to ensure long-term replacement of solid waste infrastructure will also be necessary at that time. Financial independence of the utility is important for long-term decision making.

7. ACTIONS

- 1. Performance-based solid waste operating contracts will be developed. These contracts will provide financial incentives for the contractor to help Whistler reduced costs and achieve our solid waste goals.
- 2. a) Staff will proceed with design and construction of a dry wood chip storage building for the compost facility. This will be done either as a capital project in the 2014 budget or as part of the new operating contract for the compost facility.

b) The alternative food waste composting facility now operating in the sea to sky corridor will be utilized to reduce costs at times of the year when the Whistler Compost Facility is over capacity. Cost reductions will be realized through reduced shipments of biosolids to landfill.

c) A cost-benefit analysis of converting the compost facility to biofuel production will be completed.

3. The municipal Garbage Disposal and Wildlife Attractants Bylaw will be updated to provide additional incentives for diversion of organics and recyclables from this waste stream. These changes will be

implemented in conjunction with new provincial stewardship programs in May 2014 and will allow these sectors to improve diversion and reduce costs.

- 4. RMOW staff will respond to the PPP request for proposals by Sept 16, 2013. The RMOW will participate with the new program if it reduces recycling costs to the RMOW and maintains service levels for our residents. As part of this program the RMOW will be required to staff the Nesters and Function Junction depot sites. RMOW staff will also request that Whistler be included with the new PPP Streetscape collection program.
- 5. Over the next several years the contribution to the Solid Waste Utility from the General Fund will be phased out and proper levels of reserve funding will be established to ensure the long-term replacement of solid waste infrastructure.

