City of Whitehorse

Solid Waste Action Plan

Details and Implementation

August 2013

The Solid Waste Action Plan Details and Implementation document provides the context, timeline, specific costs and recommendations for achieving 50% waste diversion by 2015 as Whitehorse heads to Zero Waste by 2040.

PARTNERS in waste diversion

Whitehorse
THE WILDERNESS CITY

Please contact *environment@whitehorse.ca* for the SWAP summary document.

City of Whitehorse

Solid Waste Action Plan
Details & Implementation Document

Prepared By:
Environmental Coordinator

Submitted to Council:
August 5th, 2013

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Acknowledgements

The City of Whitehorse would like to thank all of those who generously gave their time, effort, expertise and enthusiasm over the past year in the Solid Waste Action Plan process. In particular, the City would like to acknowledge our partners in the waste industry who continually came forward with flexible, practical and innovative solutions to waste management issues. The City would also like to give a special thank you to the Whitehorse Chamber of Commerce and all the businesses who brought forward great examples of diversion efforts already in action, and ways in which it could be done better.

Lastly, it should be noted that the commitment from Whitehorse City Council and City staff to the SWAP process has been unwavering. Recognizing the importance of this strategic priority, City management and administration worked tirelessly behind the scenes to ensure that this was a fair, accurate and accessible plan.

The City also wishes to thank all of those who took the time to come learn and share their ideas at the open houses, consultations, and various SWAP events. We look forward to the continued support and cooperation from our Partners in the Plan

PARTNERS
in waste diversion

Multi-Sector Working Group

Joy Snyder, Raven Recycling Society
Pat McInroy, P&M Recycling
Garret Gillespie, Boreal Compost Enterprises
Dave Randall, PNW Waste
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Wes Wirth, General Waste Management
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Stuart Mackay, Habitat for Humanity
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Denny Day, Profile Finish Carpentry
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Laura Williamson, Hougen's Group

Creative & Technical Support

Maura Walker & Associates
Cambio Consulting
Tanya Handley Graphic Design

Summary for City Council

Following is a basic look at the SWAP in terms of services by sector, costs and Council specific actions required to implement the SWAP. **See the SWAP Summary document and/or p.44 and 45 of this document for a complete list of recommendations**.

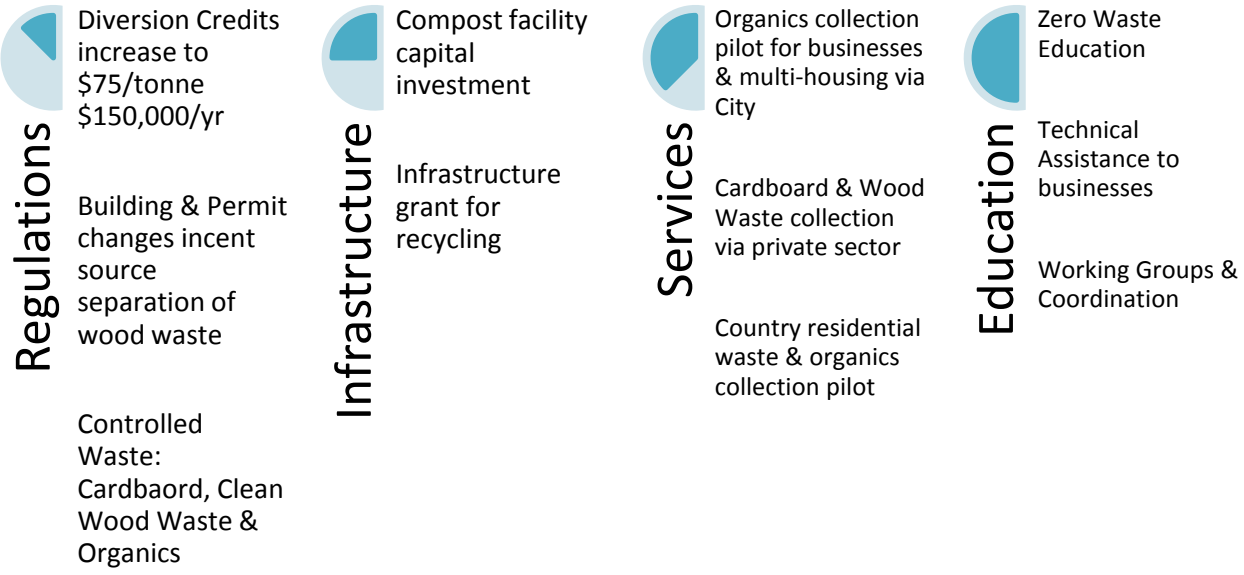
for businesses	Recommendation to Council
Commercial Cardboard Collection	Add Cardboard to the Controlled Waste Schedule in the Waste Management Bylaw in May 2014
Commercial Organics Collection	Add Organics to the Controlled Waste Schedule in the Waste Management Bylaw in April 2015
Enhanced Recycling Services	• Increase Diversion Credits from $50 to $75/tonne and increase the cap from $100,000 to $150,000 • Amend Diversion Credit Policy to include infrastructure grant
Technical Assistance & Education	Approve the transitional capital project of $253,000 for 2014 and 2015 for SWAP implementation (includes tech.asst, education, organics pilots)

for residents	Recommendation to Council
Organics Collection to Multi-housing (condos, apartments, mobile homes)	Approve the transitional capital project – *as noted above*
PILOT Organics & Waste Collection in Country Residential neighbourhoods	Approve the transitional capital project – *as noted above*
Zero Waste Education	Support a budget amendment in 2013 that includes $30,000 for a Zero Waste and general education

for builders	Recommendation to Council
Wood Waste Collection	Add Clean Wood Waste to the Controlled Waste Schedule in the Waste Management Bylaw in September 2014
C&D Wood Waste Strategy	Support a budget amendment in 2013 that includes $10,000 for a wood waste strategy
Technical Assistance & Education	Approve the transitional capital project – *as noted above*

Essential Elements of the SWAP

HIGHLIGHTS

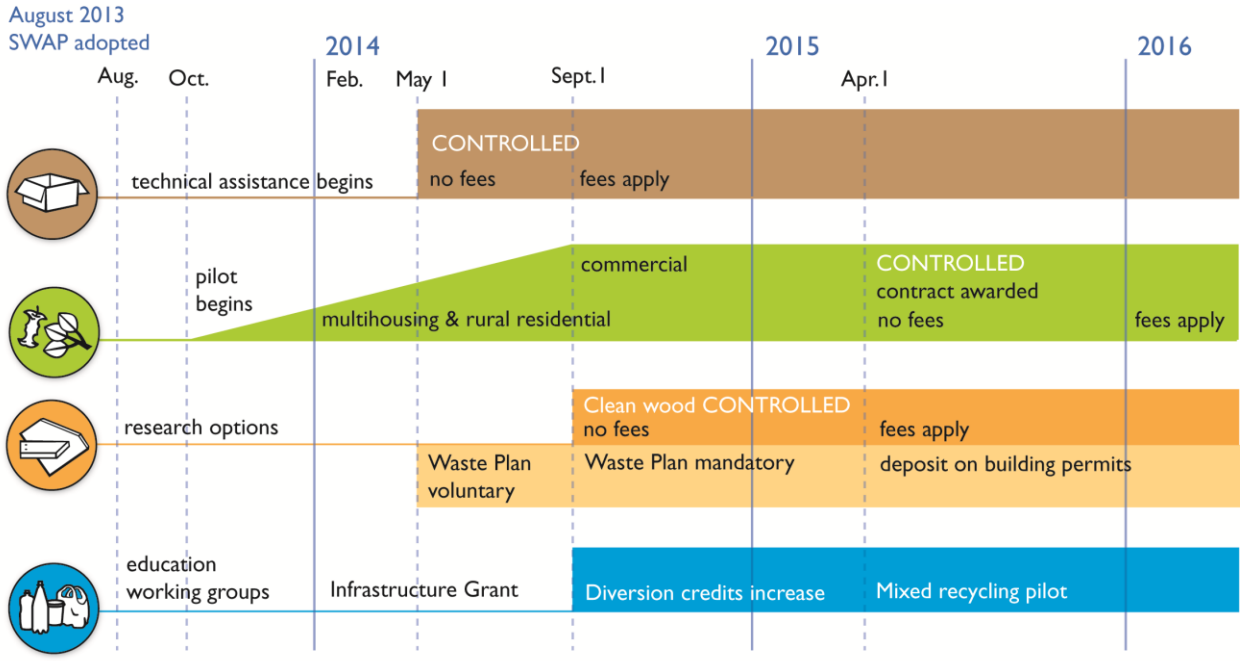


HOW MUCH

For	From Where	Total	Note
Ongoing Diversion Services (staff, diversion credits, education)	Tipping Fees	**$200,000/yr**	Increase commercial tipping fees from **$76 to $86/tonne**
Transitional Costs (2 years)	Non committed funding requiring Council's approval	**$505,000** 2014 - $253,000 2015 - $253,000	Total project is **$2,435,000** (primarily funded via Gas Tax and YG Build Canada*)
Budget Amendment 2013	General Reserves	**$50,000**	Required to start implementation in 2013

**Verbally secured at time of writing*

BASIC TIMELINE



Introduction

With a goal of Zero Waste by 2040, identified in the Whitehorse Strategic Sustainability Plan, the City of Whitehorse is updating its Solid Waste Action Plan (SWAP). A SWAP is a broad visionary document designed to determine key waste management strategies for increased waste prevention, reduction and diversion.

The development of the SWAP is one of the **City Council's top 5 priorities in the 2013 Strategic Plan**. With City Council's leadership, City administration engaged stakeholders from a variety of sector groups (e.g. waste industry, multi-housing units, businesses etc.) over the course of 9 months to design the basic elements of the plan. The results of those consultations have been developed into two documents: the Solid Waste Action Plan Summary Document and the SWAP Details and Implementation document. The following SWAP Details and Implementation document provides the analysis, background and implementation planning details to support the shorter SWAP Summary Document.

Getting to 50%

Recognizing the need to rethink waste as a resource, and in doing so extend the life of the landfill, City Council asked that this SWAP test an initial target of achieving 50% waste diversion by 2015. As a result, this SWAP narrows the focus to specific sectors, commodities and actions that help minimize waste generation and maximize waste diversion as a first step to Zero Waste by 2040.

While the initial target of 50% waste diversion by 2015 is ambitious, there is the recognition by City Council that this target resonates with the community and takes a pro-active approach to waste management for the municipality. By focusing on an aggressive approach to cardboard, organics, wood waste diversion, and a moderate approach to mixed recycling diversion, the municipality is planning a targeted approach to significant waste diversion. In addition, since the **vast majority of landfilled waste (93%) is coming from two sectors** (Institutional, Commercial, Industrial and Construction & Demolition), the mechanisms for diversion are focused on those with commercial collection.

Scope of the Plan

As the priority of this plan is to achieve a significant diversion goal within a short period of time, the recommendations within are focused on an implementation period between adoption of the SWAP and the end of December 2015. A review of the Solid Waste Action Plan, including diversion data, services, timeline and costs will be required in 2016.

Recognizing the work required to achieve a goal of 50% waste diversion by 2015, this SWAP offers a detailed implementation plan, including resource requirements, regulatory amendments, timelines and costs. With that said, the landscape under which the SWAP has been created continues to evolve. **As such, the SWAP provides the broad direction with clear targets, but requires review and assessment along the way.**

RECOMMENDATION: Review the costs, diversion rates, timelines and overall SWAP implementation plan on a yearly basis. Make adjustments with consultation of key stakeholders.

Plan Development

Stakeholders

The Solid Waste Action Plan sets the vision for how our community handles its waste. As such, individual and sector based stakeholders were engaged from the outset of this process. Sector based stakeholders included: the **Waste Industry** (processors and haulers), **Businesses** (Whitehorse Chamber of Commerce, various businesses) & **Institutions** (Yukon Government, Yukon College etc.), **Multi-housing residents** (condos, apartments, mobile homes), **Construction & Demolition** (C&D), and the **General Public**. Because the ICI (Institutional, Commercial, Industrial) sector produces the most waste going to landfill (62%), the focus of these consultations was on those receiving commercial waste collection, rather than those receiving curbside collection.

Plan Process

Plan Development
August to October 2012
- Individual & Sector Based Consultations & Public Survey

Design Workshop
November 2012
- Waste Industry & Multi-Sector Working Group

Options Development & Review
November 2012 to March 2013
- Waste Industry & Multi-Sector Working Group

"Partner" Option Review
March to April 2013
- Sector based consultations & Public engagement

SWAP Development & Review
April to July 2012
- General Public & Stakeholders

Proposed Approval & Implementation
July 2013 to December 2015

Background

The last City of Whitehorse SWAP was written in 1995, with an updated version in 1998. The primary recommendations that came from these documents were:

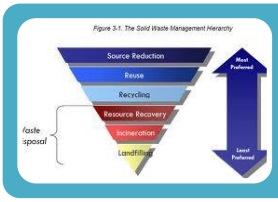
- The implementation of a user-pay system at the landfill (e.g. tipping fees)
- Initiation of full cost accounting for waste disposal
- Expansion of the organics collection program (e.g. Waste Watch) to all residents who have their garbage collected by the City of Whitehorse
- Implementation of a user pay system and review of disposal options for tires
- Source reduction, reuse, recycling and hazardous education programs

Since then, the City of Whitehorse has come a long way in implementing these recommendations. The Waste Management Facility (formerly the Whitehorse Landfill) now has 5 different waste categories (compostable, recyclable, controlled, banned, and residual), and a complete schedule of fees charged for managing these wastes. The Waste Management Cost Recovery Bylaw was written, and recently amended, to ensure all waste management activity costs are fully recovered via tipping fees and utility charges. With support of Gas Tax funding, the City has been able to successfully expand organics collection to the roughly 5500 homes receiving curbside collection. And finally, the City continues to offer education programs and diversion services both internally and for the community at large (e.g. HHW collection days, City facilities recycling/composting, etc.).

Guiding Principles

Optimize Community Resources

- The Whitehorse landfill is a highly valuable resource to our municipality and the larger Yukon community. The City of Whitehorse must minimize residual waste and maximize waste diversion opportunities to extend the life of the landfill.



Waste Management Best Practices

The City of Whitehorse shall reduce disposal of municipal solid waste using waste management best practices. The City will make waste management decisions in accordance with the hierarchy of "Reduce, Reuse and Recycle" and consider zero waste principles and the City's sustainability goals, when setting new waste diversion targets.

Partners for Success

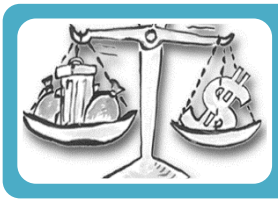
The City of Whitehorse must lead and encourage the changes necessary to adopt the principles of waste minimization through defined partnerships with local organizations and the private sector (i.e. regular stakeholder meetings or contracted services). All actions included in this Plan will be undertaken in consultation and cooperation with Yukon government, Federal Government, First Nations, key stakeholders, and the public.

Leadership in Action

The City of Whitehorse will show leadership in waste management by using both internal (i.e. administrative directives) and external policies or legislation (i.e. bylaws, fee changes etc.) to support and achieve the City's waste diversion goals.

Continuous Education

Education and feedback (i.e. celebrating successes) are essential elements to influence behavior, and will therefore be of critical importance to the success of the Plan. The City of Whitehorse must engage and involve stakeholders and the public with continual education and feedback to support individuals and businesses taking responsibility for their waste.



Financial Sustainability

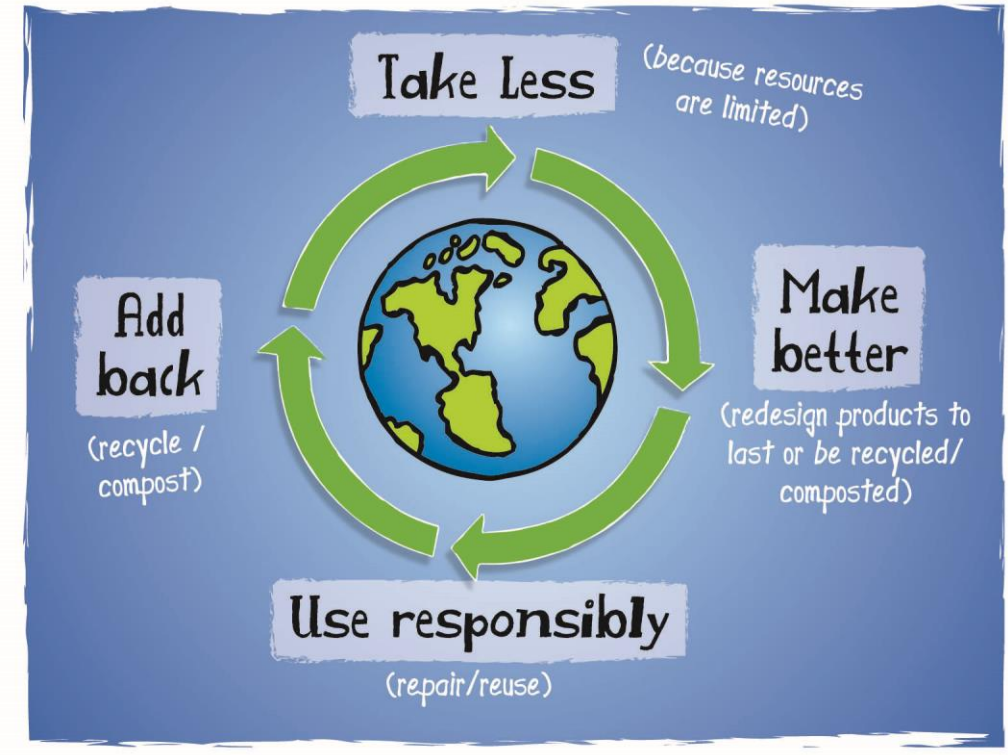
The City of Whitehorse will strive to implement full cost accounting to the greatest extent possible, such that producers and consumers are responsible for the costs of managing the waste they generate. Incentives used by the City of Whitehorse to encourage reduction, reuse, recycling and composting should include user-pay and market-based mechanisms.

Goals & Context

GOAL #1: Zero Waste by 2040

Essentially Zero Waste shifts the idea of making a product "go away" via municipal waste facilities to becoming an input resource to be used again. Ideally, that starts with waste prevention, ensuring waste is not created and brought into the waste stream in the first place. Under a Zero Waste model, those materials that currently cannot be recycled or composted (roughly 20-35% of waste depending on the sector), will be redesigned so they can become an input via reuse, recycling, composting. To support the larger global goal of Zero Waste, Whitehorse will maximize waste diversion locally to the greatest extent possible. Because the City of Whitehorse has limited ability to influence large manufacturers, it is recognized that getting to ***80-90% waste diversion is considered Zero Waste*** (or darn near).

Basic Model of Zero Waste



Definitions of Zero Waste

Zero Waste – Yukon Solid Waste Advisory Committee[1]

Although there are many definitions for zero waste in use around the world, the Solid Waste Advisory Committee has adopted the position that the concept of zero waste in the territory will minimize waste generation and maximize resource recovery through reuse, recycling, composting and other efforts to achieve the greatest possible resource diversion.

The Solid Waste Advisory Committee views zero waste as following a "4R" hierarchy; Rethink, Reduce, Reuse and Recycle/Compost. "Recovery" of the potential energy through various incineration technologies is not included in this model of zero waste.

Zero Waste International Alliance[2]

Zero Waste is a goal that is ethical, economical, efficient and visionary, to guide people in changing their lifestyles and practices to emulate sustainable natural cycles, where all discarded materials are designed to become resources for others to use.

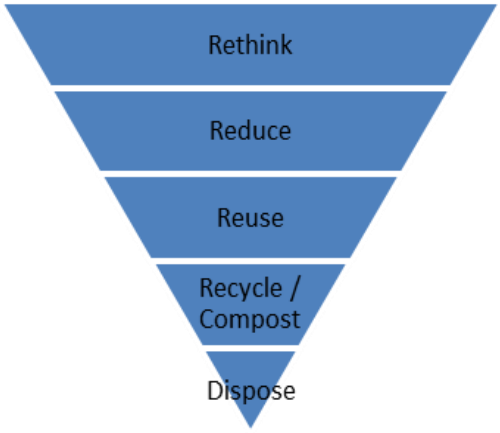
Zero Waste means designing and managing products and processes to systematically avoid and eliminate the volume and toxicity of waste and materials, conserve and recover all resources, and not burn or bury them.

Implementing Zero Waste will eliminate all discharges to land, water or air that are a threat to planetary, human, animal or plant health."

[1] Solid Waste Advisory Committee, *Zero Waste Backgrounder: A New Approach to Waste Management for Yukon*, Yukon Government 2011.
[2] http://zwia.org/standards/zw-definition/ accessed May 2013

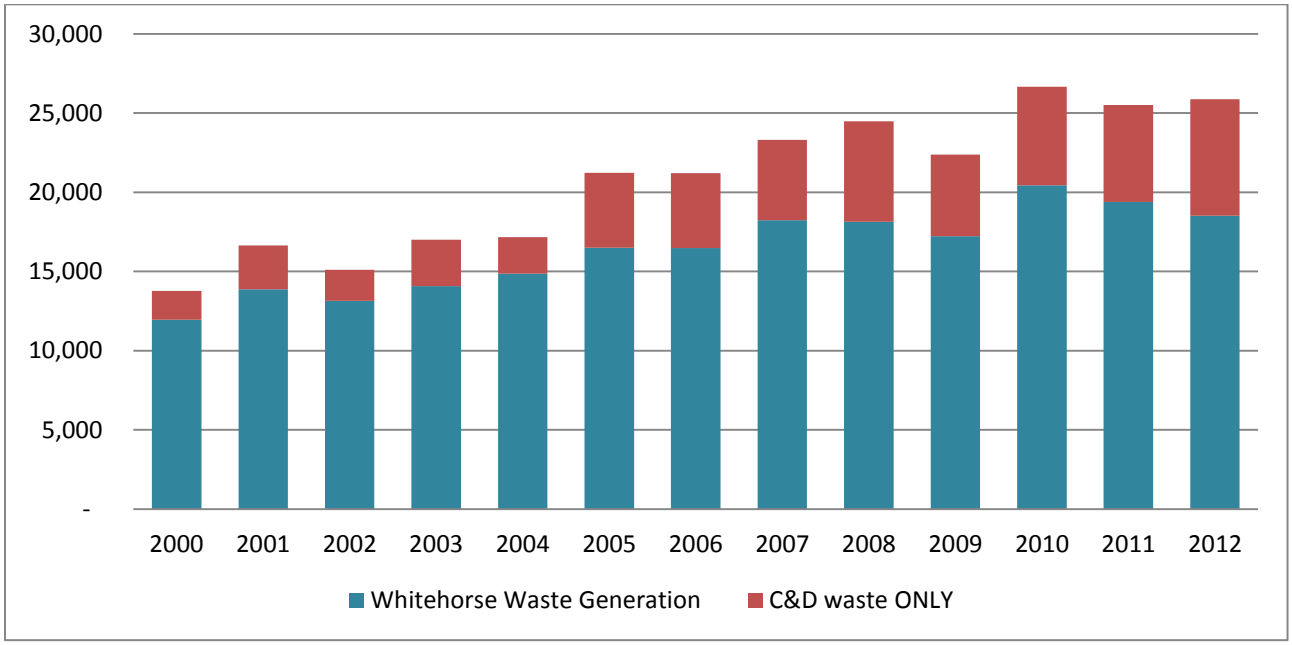
GOAL #2: Minimize Waste Generation

Waste generation includes all materials that enter the waste stream *before* they are handled via recycling, composting, reuse or landfilling.



Currently, Whitehorse waste generation has increased 88% since 2000. This is partly due to the 18% increase in population of Whitehorse since 2000. However, population alone cannot explain this upward trend since the *per capita* waste generation has increased by 37% since 2000. In particular, Construction and Demolition waste has had a marked growth. Likely due to increased housing developments, **C&D waste has grown over 300% since 2000**.

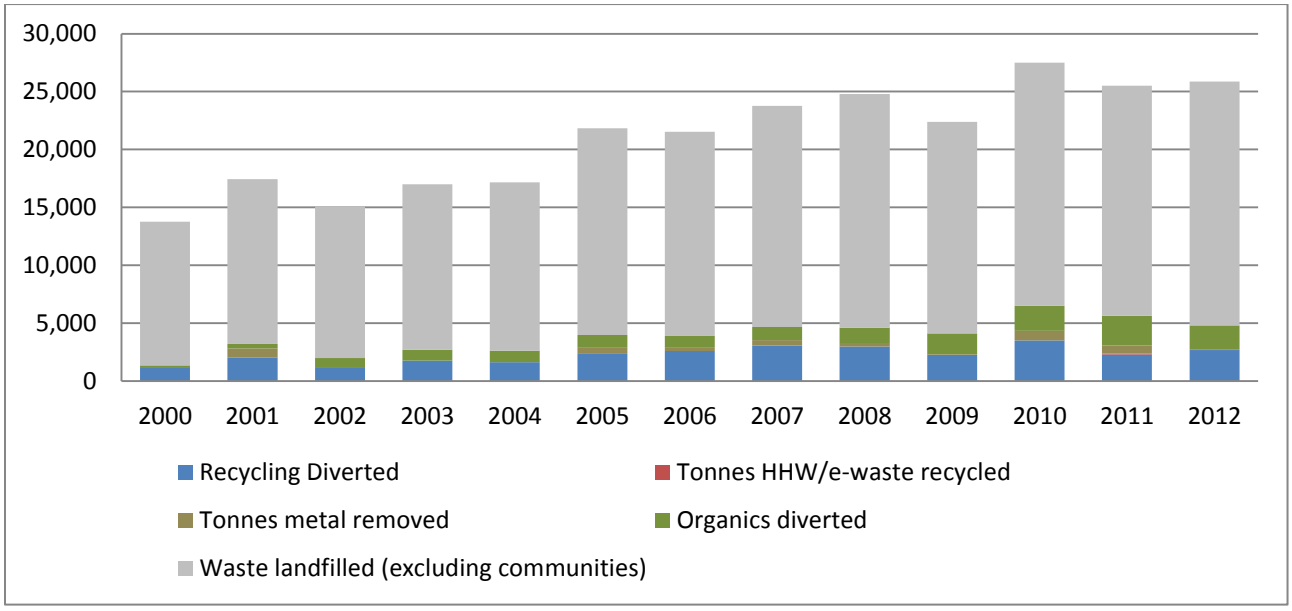
Whitehorse Waste Generation, 2000-2012



GOAL #3: Maximize Waste Diversion

Waste diversion includes the combined efforts that reduce the amount of waste being landfilled. This can include waste prevention, reduction, reuse, recycling, and composting. Various waste incineration technologies may be considered diversion in some waste management systems, but is not considered waste diversion by either the Solid Waste Advisory Committee or the Zero Waste International Alliance's definition of Zero Waste.

Waste Diversion in Whitehorse, 2000-2012



Each year, the City determines the diversion rate by dividing the total tonnes of materials diverted from landfill (via composting, recycling, reuse etc.) by the total tonnes of waste generated (all waste handled regardless of destination). In 2012, the **City of Whitehorse diverted 19% of its waste** (recycling – 10%; composting – 8%; reuse – 1%). The diversion rate in Whitehorse has generally kept pace with the growing waste generation rate, but has been unable to divert more than 22% in any given year. Increases in waste diversion are primarily due to private sector recycling efforts (Raven Recycling Society and P&M Recycling) and the City's residential curbside compost collection program.

GOAL #4: Waste Management is Financially Self Sufficient

Waste Management Cost Recovery

The City collects **100% of the costs of managing waste through user fees** (e.g. tipping fees and utility bills) as per the Waste Management Cost Recovery Bylaw amended and approved by City Council in March 2013. This Bylaw recognizes Council's support for a user-pay system, whereby the generators, rather than the general taxpayer, are required to fund the costs associated with waste management.

2013 User Fee Adjustment

In 2012, a review of the full life cycle costs of Whitehorse's Son of War Eagle landfill revealed that landfilling costs were higher than previously estimated.[3] The primary causes of this were:

- **Remaining landfill capacity reduced from 78 to 41 years**, thus increasing the yearly Landfill Closure Liability
- Other costs adjusted or newly accounted for (e.g. environmental mitigation; capital costs etc.)

In addition to a review of landfill costs, City administration completed an internal review of the costs for other waste management activities, such as composting, reuse and recycling. The result of both the landfill cost assessment and the internal review was that the current user fees were not sufficient to cover the full costs of waste management. This shortfall would either need to be recovered through the general tax base or through increased user fees.

To comply with the Waste Management Cost Recovery Bylaw, City council approved a 2-stage increase in user fees. The first increase was implemented May 1st, 2013 and the second increase is recommended for January 1st, 2014. Based on Council's approval of the SWAP, the second increase will include the costs to implement and operate the waste management system based on the SWAP recommendations.

RECOMMENDATION: Incorporate SWAP implementation expenses as part of the cost adjustment required January 1, 2014 to meet to the Waste Management Cost Recovery Bylaw.

[3] Morrison Hershfield (Don McCallum). *City of Whitehorse Landfill Cost Assessment: Final Report*, January 8, 2013.

Financial Cost Benefit of Waste Diversion

COST Because there are high fixed costs when managing waste via landfilling, composting, and recycling (e.g. heavy equipment), costs do not necessarily go down when we divert more. In fact, when we reduce the amount we send to the City Landfill, the per tonne costs to operate the landfill increase, at least in the short term. As a result, user fees need to be continually adjusted to account for the loss of landfill revenue and the increase in diversion expenses.

BENEFIT With that said, increased diversion helps balance the increased cost/tonne by reducing the Landfill Closure Liability (LCL). The LCL is money set aside each year to pay for the clean-up and final closure of the current landfill. The yearly LCL amount is directly correlated with the volumes of waste disposed. As a result, waste diversion reduces the yearly LCL costs. Diversion also delays the high cost of expanding the landfill (estimated at $13,700,000), which is not included in the LCL. In addition, waste diversion decreases the environmental liability of landfills, brings money into the community (via recycling commodity sales), increases jobs in waste management, and overall, supports the development of a local green economy.

Diversion Impacts of Landfill Closure Liability Costs over time

	NO NEW Diversion	50% Diversion
2013	$ 146,931.24	$ 96,634.90
2053	**$ 869,548.33** Landfill DONE; *$13,700,00 now required for NEW Landfill*	**$ 376,474.49** PLUS 15 years or more left of current landfill

Sustainable Waste Management Financing

Extended Producer Responsibility (EPR)[4]

What is it?

The Organization for Economic Co-operation and Development (OECD) defines "EPR as an environmental policy approach in which a producer's responsibility, physical and/or financial, for a product is extended to the post-consumer stage of a product's life cycle. There are two key feature of EPR Policy:

1. Shifting responsibility upstream to producers and away from municipalities
2. To provide incentive to producers to take environmental considerations into the design of the product."[5]

What is the status?

Nationally, the Canadian Council of Ministers of the Environment (CCME), through the ***Canada-wide Action Plan for EPR***, supports the move towards greater producer responsibility, including work towards transforming "product stewardship" initiatives (e.g. Beverage Container Regulation or the Designated Materials Regulation) into full EPR programs.

Locally, the **Association of Yukon Communities** carried two motions in May 2012 recognizing the importance of expanding current stewardship legislation.

> THEREFORE BE IT RESOLVED THAT the Association of Yukon Communities petition the Yukon Government to review the Designated Material Regulation with the intent of expanding the range of materials designated under the regulation;
>
> THEREFORE BE IT RESOLVED THAT the Association of Yukon Communities petition the Yukon Government to review the Beverage Container Regulations with the intent of expanding the range of materials designated under the regulations; [6]

[4] For more information on EPR in the Yukon read, *"Solutions Through Stewardship: A review of product stewardship programs and recommended options for implementation in the Yukon"* prepared for Recycling Processors Review Working Group by Bryna Cable and Kristina Craig, June 2011.

[5] Orgnaization for Economic and Cooperative Development. *Extended Producer Responsibility: A Guidance Manual for Governments.* Working Party on Pollution Prevention and Control. October 2000.

Why is it important?

All waste management activities cost money. The growing trend in waste management financing is to move the costs of disposal from the end of life (via tipping and utility fees) to the purchase price, where consumers can make a choice based on the full life cycle cost of the product. The more items added to current stewardship programs (e.g. Designated Materials Regulation or the Beverage Container Regulation) or new Extended Producer Responsibility legislation, the greater the ability the City has to reduce its tipping and utility fees.

Recycling Processor Financing

Currently, both processors (Raven Recycling Society and P&M Recycling) recycle Beverage Container Regulation (BCR) materials (e.g. pop cans and beer bottles) and continue to voluntarily recycle non-BCR materials (e.g. cardboard and tin cans) using revenues from the BCR and other sources of income. The commodity values they receive are unstable and do not cover the costs to handle, process and ship recyclable material.

In previous years, the Yukon Government supported non-profit recycling processing through grants from the Community Development Fund. This is no longer a common practice due to the recent changes to the CDF guidelines. As such, the **City of Whitehorse's Diversion Credits ($50/tonne with a cap of $100,000) is the only form of direct government financial support for non-refundable recycling processing**. Both processors suggest this level of government funding is not sufficient to sustain the heavy capital and operational expenses required to maintain and grow the recycling system in Whitehorse.

To address this concern, the City of Whitehorse is committed to enhancing the Diversion Credit system to support recycling processors in the short-to-medium term until a territorial stewardship (expanded) or EPR system is developed.

[6] Minutes: *Association of Yukon Communities, 2012 Annual General Meeting: May 6, 2012 Dawson City, Yukon*.

Issues with Current Diversion Credit System

The Diversion Credit system is not a viable long term solution for funding recycling services. In most other regions in western Canada, the municipal or regional district secures recycling collection and processing services by offering it directly (via their own employees) or indirectly (via a contract for service with a private sector company). Costs incurred by the government, are charged to the customer (household or business) as a utility or as part of general taxes.

Reasons why the Diversion Credit system is not considered a long-term solution:

- the funds do not respond to market conditions (e.g. higher or lower commodity prices)
- the funds are derived from general tipping fees, and thus does not align the user to the costs of recycling
- there is a cap on funds, thus limiting the incentive to divert
- if the funds are not sufficient, there is a risk to the municipality that recycling services will not continue

Reasons why the Diversion Credit system is recommended to be increased:

- Currently, this funding is critical to recycling processors
- Supporting recycling processors financially reduces the risk to the City of Whitehorse that they will discontinue services
- The system is established and is applicable to both processors equally
- The system incents diversion based on a per tonne basis
- Increasing the Diversion Credit to $75/tonne is closer in line with the costs of disposal

Role of Yukon Government

As a regional waste management facility, the City of Whitehorse accepts waste from Yukon communities in order to lessen the high costs of landfilling in smaller communities. Outside communities waste is charged on a per tonne basis to cover the liability and impact to City of Whitehorse landfill life. As such, the roles and responsibilities of the City's waste management system are shared with the territorial government. With the Diversion Credits designed as a temporary solution to recycling processor financing, it is imperative that the City partner with YG to create a long term financially sustainable solution to recycling financing. Considering that the vast majority of Yukon citizens reside in Whitehorse, a collaborative strategy for waste diversion financing would benefit and support both the City of Whitehorse and the Yukon Government's diversion goals.

Stakeholder Engagement

Provided below is a snapshot summary of the stakeholder consultations. Further information on specific groups and/or consultation events is available in the SWAP Integrated Planning Workshop final report (noted in the reference section).

Stakeholder Group	They Wanted	Main Concern
Waste Industry	• Assurance via strong legislation and coordination.	Profitability if financial incentive too small
Businesses & Institutions	• Education and Assistance to make diversion easy and affordable.	Space and labour time
Multi-Housing (condos, apartments, mobile homes etc.)	• Organics collection and education for residents.	Space and hauling costs
Construction & Demolition	• Reuse options and profitability in deconstruction efforts	Labour costs, and storage and coordination of reusable materials
General Public	• Recycling collection (e.g. blue box or neighbourhood bins)	Convenience

Getting to 50% Waste Diversion

Integrated Planning Workshop

After initial sector-based consultations focused on the challenges and opportunities of reaching 50% waste diversion, the City engaged a group of multi-sector representatives in a 2-day intensive planning workshop.[7] The goal of this workshop was to develop the actions and strategies for key waste materials and sectors. Workshop participants identified four priority materials for increased diversion; below are the key action recommendations for each one:

Priority Materials, Sectors, & Strategies

Organics (ICI and C&D sectors) – *aggressive approach*
Ban in 3 years
Differential tipping fees (always lower for organics than unsorted waste)
Two tier pick-up & route (big bins & City-type wheeled bins) as options for hauler clients
Increase capacity of processing – investment in equipment & infrastructure

Cardboard (ICI sector) – *aggressive approach*
Full ban on landfilling cardboard within two years
City hires coordinator to assist businesses, apartments/condos, and institutions in transition
ICI clients sign up for collection and sort at source
Haulers and processors upgrade infrastructure and services offered

Wood Waste (C&D and ICI sectors) – *aggressive approach*
Establish re-use facility (e.g. Re-store)
Tipping fee surcharge for waste-wood in garbage (unsorted load fee)
Provide incentives for producers and builders to sort wood waste on site
Including wood waste management plan in building permitting

[7] *City of Whitehorse: Solid Waste Action Plan (SWAP) Integrated Planning Workshop, November 13-14, 2012*. Prepared by Joy Beauchamp and Mark Nelson, Cambio Consulting. December 2012

Mixed Plastics (ICI sector) – *moderate approach*
Multi-material satellite depots for businesses and multi-family
Create City procurement policy that can include pre-cycling requirements
Mandated source separation for C&D permits and Internal City building & user groups contracts
Research on local reuse options for plastics

General Recommendations from Integrated Planning Workshop

In addition to recommendations for specific materials, the workshop also produced a number of insights and recommendations concerning the overall waste management system in Whitehorse:

- An aggressive approach to addressing priority waste materials is needed in order to reach 50% diversion by 2015.
- Diverting significant amounts of waste materials will require some infrastructure investment.
- The City of Whitehorse is not currently covering the full costs of waste management through user fees, and this gap needs to be addressed regardless of diversion targets.
- Leadership from the City and technical assistance are critical for the first steps in a staged diversion approach, culminating in a ban or bans
- Coordination and support for waste industry partners is required to ensure diversion efforts can be achieved.
- Continued collaboration is needed between City and Yukon Government regarding Extended Producer Responsibility (EPR), Beverage Container Regulations (BCR), Designated Materials Regulations (DMR), options to regionalize and financial support of waste management.

SWAP Options Development

In response to ideas and suggestions developed at the SWAP Integrated Design Workshop in November, four options for the Solid Waste Action Plan were developed, each with different diversion goals, costs, and policy frameworks. The details of these options (policies, timelines, services etc.) were then developed, reviewed and modified by City administration, City Council, an independent consultant (Maura Walker & Associates), the waste industry, and once again, by the participants of the initial Integrated Planning Workshop in a ½ day workshop in March, 2013.

Options Summary

For further information review SWAP 2013 Options (see reference section). While only two of the proposed options reached the 50% target, each option increased overall waste diversion. Options were designed to provide a spectrum of diversion targets and costs. The costs associated with each option incorporated the new full cost of waste management baseline as defined by the recently amended Waste Management Cost Recovery Policy.

	STATUS QUO PLUS	THE STARTER	THE PARTNER	THE SORTER
Approach	Current System Efficiencies	Moderate Policies for top 3 commodities	Education & Policies for Comprehensive Source Separation	Policies & End Stage Sorting Facility
Primary Mechanism	*Enforcement*	*Differential Tipping Fees*	*Technical Assistance & Material Bans*	*Material Bans & Sorting Facility*
Tipping Fee Required (baseline **$75/tonne**)	$78	$80	$84	$95
ONE TIME Cost	$120,000	$220,000	$520,000	$1,405,000
Diversion Estimate	25-30%	30-35%	45-50%	50-55%

	STATUS QUO PLUS	THE STARTER	THE PARTNER	THE SORTER
PROS	✓ Cheap ✓ Easy to Implement	✓ Addresses top volume commodity diversion ✓ Requires *less* large scale change	✓ Achieves diversion goals ✓ Provides new collection services ✓ Front end assistance ✓ Personal responsibility ✓ Addresses long term liability issue	✓ City gains 100% control of waste to landfill ✓ Achieves diversion goals ✓ Provides an option to "not sort" for a fee ✓ Addresses long term liability issue
CONS	▪ No new services ▪ Does not achieve diversion goals ▪ Long term liability issue remains	▪ Few new services ▪ Other materials not addressed ▪ Questionable economies of scale for haulers / processors	▪ Source separation is logistically challenging ▪ Requires increased labour ▪ Significant change in behaviour difficult	▪ Untested at this scale ▪ Business case unknown ▪ High costs ▪ May have significant contamination issues ▪ May reduce source separation

Criteria for Decision Making

In order to determine the option to use as the basic framework for SWAP development, the group assessed each option based on the following criteria:

- Are the capital costs reasonable?
- Are the tipping fees reasonable?
- Will the community support this option?
- Will this option meet our diversion goals?
- How easy will this be to implement?
- Will this option provide ease for the customer? (e.g. more services, better logistics etc.)

While there was healthy discussion on the ranking of individual criterion, both City Council and the Integrated Planning Workshop participants named, "meeting diversion goals" and "ability to gain community support" as priority criteria.

The Partner Option

After reviewing the costs, benefits, challenges and logistics of each option, **SWAP Workshop participants and City Council unanimously agreed that the development of the Solid Waste Action Plan should be based on "The PARTNER" option.**

Reasons for developing the SWAP based on the Partner model were as follows:

- Meets diversion goals
- Involves all stakeholders; allows partnerships
- Stronger education and policy driven
- Allows growth for the private sector
- Ease for the customer
- Reasonable capital cost
- Strong incentives
- Anticipates reduction in waste in the future, not just diversion focused
- Encourages community responsibility

Action Plan Overview

The City's main role in the SWAP partnership with industry and other key stakeholders is to set the framework for successful waste prevention and diversion. Specifically, the City will do this by balancing education and support with clear and fair regulations. Recognizing the focus of the SWAP is on specific commodities (Cardboard, Organics, and Wood Waste) from specific sectors (ICI and C&D), this SWAP has several key strategies.

Key Strategies

1. Design **education and technical assistance programs** with and for key stakeholders to support behaviour and systems change.
2. Create clear, fair **regulations** (via Bylaws and permits) that provide a strong financial incentive for waste prevention and diversion activities.
3. Support the private sector to expand or create **new collection and processing services** for enhanced recycling and composting.

Mechanisms & Anticipated Services by Commodity

Commodity	Mechanisms	NEW Services Anticipated
Organics	Compost facility improvements Lower tipping fee for sorted organics Organics moved to Controlled Waste Schedule in 2015	• Progressive PILOT (City run) for Multifamily & Commercial sector • PILOT (via commercial contract) for rural residential areas • Comprehensive commercial & multifamily organics collection (contracted to a hauler)
Cardboard	Cardboard moved to Controlled Waste Schedule in 2014 Increased Diversion Credits ($50 → $75/tonne)	• Comprehensive ICI cardboard collection & processing
Wood Waste	Create C&D Diversion Strategy* Lower tipping fee on sorted wood waste Mandatory C&D Waste Plan Refundable deposit for C&D projects Clean Wood Waste moved to the Controlled Waste Schedule in 2014/15	• Clean wood collection by commercial haulers • Possible reuse options • Possible grinding treated wood for landfill cover
Mixed Recycling	Increased Diversion Credits ($50 →75/tonne) Increased Diversion Credit cap ($100,000 to $150,000) Infrastructure grant for processors and haulers Pilot Collection support Advocacy to YG to support stewardship and/or direct funding for recycling industry	• ICI Satellite bins or bag-based collection service paid for via users or partially through diversion credits
General	Technical Assistance for ICI & C&D sectors Hauler / Processor Working Group ICI & C&D Working Groups Permit changes to include diversion considerations Increased Enforcement at Landfill Public Education – Zero Waste City Internal Green Procurement City Internal Waste Diversion	• Possible expansion of Residential fee-for-service Blue Box Program (Yukon Blue Bin Society or other) • Possible Habitat for Humanity ReStore (reuse in all sectors)

*C&D Diversion Strategy

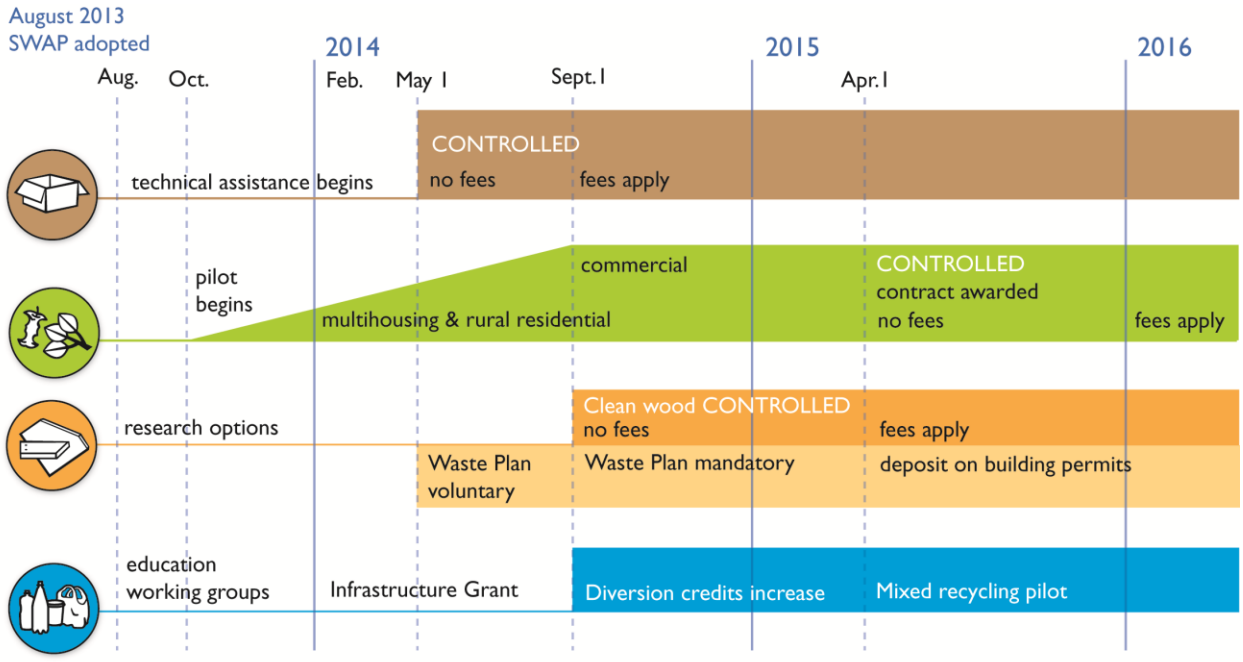
The SWAP addresses C&D wood waste by setting the stage for source separation of a material that is bulky and represents 15% of landfilled waste. Consultation with sector and non-sector representatives indicated that there are a variety of options for diverting C&D waste once source separated, but that the logistical and financial feasibility of each option is largely unknown. In order to ensure the City is gaining effective diversion for a reasonable cost, options for C&D waste need to be analysed further.

RECOMMENDATION: Create a C&D waste diversion strategy based on the analysis of the financial feasibility, landfill capacity gains and diversion potential of each diversion option. Consider doing this in partnership with YG Community Services to create rural community synergies.

Diversion Targets

By Year End	Initial Target	Rationale behind diversion
2013	20-25%	Zero Waste education & SWAP technical assistance preparing commercial sector for controlling cardboard
2014	30-35%	Cardboard & Clean Wood Waste controlled; organics pilot growth; some increase in mixed recycling collection
2015	45-50%	organics controlled; C&D treated wood strategy implemented; deposit system in building permit; mixed ICI recycling pilot
Early 2016	50% +	Priority commodities have been targeted and services developed

Basic Implementation Timeline



SWAP Operating Costs

Funding Allocation

When determining the costs of the implementing the SWAP, costs were divided into two categories: ongoing operational costs to be funded via user fees (as per the Waste Management Cost Recovery Bylaw), and short term implementation costs to be funded as a capital project with a combination of internal and external funding. Keeping these costs separate means that short term implementation costs are not included in user fees (tipping fees and utility charges), thus not inflating them for a short period of time.

Ongoing Operational Expenditures

In the recent review of the full cost of waste management, City administration allocated all waste management expenses to one of three activities: landfill, compost, or recycling/reuse. To determine the estimated cost of implementing the SWAP, increases to resources (e.g. staff, materials, equipment) were added directly to line items within the City of Whitehorse Operational Budget for 2013 in order to project for 2014.

Ongoing Expenses to Be Funded Via User Fees

Item	Cost	Comments
Diversion Credits	$50,000/yr	Increased the cap from $100,000 to $150,0000 to accommodate increased diversion credit from $50 to $75
Waste Coordinator	$35,000/yr	Increasing position from ½ time to 0.8FTE
Ongoing Education	$20,000/yr	Materials for public education; Based on Solid Waste Association of North America's estimate of $2/household for ongoing education
Permanent Landfill Staff	$100,000/yr	Enhanced Landfill enforcement, education + training
TOTAL ADDITIONAL OPERATIONAL COSTS	**$205,000**	**Incorporated into tipping fees**

Determining User Fees with SWAP

The baseline budget used for this analysis included the full cost adjustment proposed for January 2014, but also shows the 2011 Actuals, and 2013 Budget (with NO SWAP) for comparison. As a result, the following financial analysis provides details on three sets of financials: the first being the pre-adjustment numbers from 2011, the second being the adjustment to full cost ONLY with no increases for SWAP implementation (based on 2013 budget), and the third being the full cost adjustment + SWAP costs (based on 2013 budget) for two fiscal years (2014 & 2015).

Using these numbers, the City can determine the user fees (tipping and utility fees) required to offset the costs of waste management (as per the Waste Management Cost Recovery Bylaw). It is challenging to forecast costs because when the types and volumes of waste changes, the revenue gained can be higher or lower than expected. With that said, the following chart shows a comparison in total costs of waste management with an average cost per tonne for the tonnes expected.

Waste Management Costs With and Without SWAP

Operating Costs (based on 2013)	PRE-Adjustment 2011	WITHOUT SWAP 2014	WITH SWAP 2014	WITH SWAP 2015
Landfill	$ 1,338,078	$ 855,488	$ 894,217	$ 938,927
Reserve - *Landfill Closure Liability*	$ 14,500	$ 146,931	$ 146,931	$ 91,239
Compost	$ -	$ 397,553	$ 472,695	$ 496,329
Recycling/Reuse	$ -	$ 306,585	$ 361,545	$ 379,623
total	$ 1,352,578	**$ 1,706,557**	**$ 1,874,457**	**$ 1,906,118**
Capital & Cleanup Costs				
Reserve - Leachate Collection	$ -	$ 63,058	$ 63,605	$ 63,605
Reserve - Capital Improvement	$ -	$ 110,000	$ 110,000	$ 110,000
Compost	$ -	$ -	$ -	$ -
Recycling/Reuse	$ -	$ -	$ -	$ -
total	$ -	**$ 173,058**	**$ 173,605**	**$ 173,605**
TOTAL COST	**$ 1,352,578**	**$ 1,879,615**	**$ 2,048,062**	**$ 2,079,723**
Total Revenue (non-tip fee)	*$ 36,900*	*$ 36,900*	*$ 43,400*	*$ 68,900*
NET COST	**$ 1,315,678**	**$ 1,842,715**	**$ 2,004,662**	**$ 2,010,823**
cost per tonne based on diversion estimates (not rationalized for diversion incentives)	**$ 54.25**	**$ 75**	**$ 80**	**$ 84**

City Handled Volumes ONLY	Actual	Estimated	
	2012 Tonnes	2014 Tonnes	2015 Tonnes*
Landfill	21,795	21,755	15,485
Organics + wood waste	2,278	2,674	7,278
Recycling/Reuse	576	576	1,107
	24,649	25,005	23,871

Notes & Assumptions

- "With SWAP 2015" incorporated 5% increase in costs to account for inflation
- The Landfill Closure Liability (LCL) is estimated based on 50% diversion for 2015 as per City of Whitehorse LCL analysis
- Increased waste volumes for 2015 by 5% to all to incorporate increased waste generation
- **Tonnages do not include tonnes processed by private sector recycling processors**
- Assumes increased compost sales based on estimated diversion rates.

User Fee Incentives with SWAP

The ideal is to charge the exact amount that is required to pay for the handling, processing and disposal of each type of waste. However, in order to encourage diversion, the following table provides a proposed set of fees that have incorporated diversion incentives. Instead of charging all users $80/tonne, there was a desire to incent diversion by lowering the fees for certain types of waste. For example, organics is charged roughly 1/3 the cost of Sorted Waste to create a financial incentive to source separate organics. When organics is listed as a Controlled Waste, that fee can come closer to the actual cost and be increased to roughly ½ the cost of Sorted Waste.

Possible Fee Structure including Differential Tipping Fees

	2014 - WITHOUT SWAP	2014	2015
Sorted Waste	$ 76.00	**$ 86.00**	**$ 86.00**
Sorted Organics	$ 26.00	**$ 26.00**	**$ 40.00**
Sorted Wood Waste	$ 76.00	**$ 69.00**	**$ 69.00**
Communities	$ 115.00	**$ 115.00**	**$ 115.00**
Unsorted Waste (penalty)	$ 250.00	**$ 250.00**	**$ 250.00**
Utility Bill	$ 3.00	**$ 3.00**	**$ 3.50**

RECOMMENDATION: Create a Reserve account for tipping fee revenues (that exceed the full costs of waste management) in order to ensure user fees are directly allocated to waste diversion programs and services.

Implementation Costs

There are a number of expenses (both capital and operating) that help the City make the shift to 50% waste diversion as part of the SWAP. Some of these expenses have already been allocated (e.g. compost equipment) and others are considered new SWAP implementation costs (e.g. carts for commercial pilot). These expenses are in addition to the ongoing costs, but are expected to have an end-date when the transition is over.

Funding for Capital Project

Roughly half of the capital project costs have already been approved in the 2013 budget. In addition, a partnership between Yukon Government and the City of Whitehorse is expected to cover another 30% of the implementation costs of the SWAP. The chart below gives a detailed account of the requested funds for the SWAP project as a whole.

Compost Facility	Total Costs	City Approved	Comments
concrete pad & water supply	$ 250,000		Possible YG funding
horizontal grinder	$ 500,000	$ 500,000	In 2014 budget
trommel screen	$ 250,000	$ 250,000	In 2013 budget
wheeled Loader	$ 350,000	$ 350,000	In 2013 budget
enviro processor (mixer)	$ 80,000	$ 80,000	In 2013 budget
total	**$ 1,430,000**	**$ 1,180,000**	

Reuse Area	Total Costs	City Approved	Comments
Reuse Area	$ 50,000	$ 50,000	In 2013 Budget
E-waste & HHW Storage	$ 50,000		Possible YG funding
total	**$ 100,000**	**$ 50,000**	

Organics Collection Carts	Total Costs	City Approved	Comments
240L wheelie carts - pilot (300)	$ 50,000		gas tax; partial user
240L wheelie carts - city wide	$ 300,000		Possible YG funding
	$ 350,000		

Country Residential Organics Pilot	Total Costs	City Approved	Comments
Enclosure for commercial collection	$ 50,000		2 neighbourhoods
	$ 50,000		Possible YG funding

Transitional Costs (2 years)	Total Costs	City Approved	Comments
Technical Assistance	$ 250,000		1.7 FTE (1FTE Organics; .7 FTE TechAsst) 2 year term
Landfill Staff	$ 100,000		assumes 1/2 time $50,000 for 2 years
Zero Waste Marketing Campaign	$ 100,000		contracted campaign for public awareness
Rural Residential Organics Collection Pilot Costs	$ 15,000		shed, bins, contract, signs etc. for 2 sites (partial fee for service, 50-50%)
New Program Education	$ 40,000		based on SWANA $4/hh/yr (10,250hh) ; other 1/2 covered in ongoing costs
	$ 505,000		

TOTAL PROJECT	**$**	**2,435,000**
In 2013 City of Whitehorse Budget	$	1,230,000
YG Build Canada Funding*	$	700,000
Remaining Required to Implement SWAP	$	505,000
PER YEAR FOR 2 YEARS	**$**	**253,000**

**based on approval from Build Canada Funding; verbal only at time of writing*

Implementation Considerations

Even though a Solid Waste Action Plan is a broad visionary document, there are a number of considerations when rolling out specific diversion projects and programs. This section is meant to address some of the challenges and opportunities of implementing this Plan, with the understanding that all planning is an iterative process, with each action needing review and adjustment on a regular basis.

Internal Waste Management

The City of Whitehorse has already begun to develop clear and consistent waste handling systems in all of its facilities. The City will continue to include waste handling plans for each facility listing the materials flow, service providers and persons responsible for each element of the overall waste handling plan. In addition, the City will continue to implement a workable green procurement policy with corresponding evaluation tools as per the Sustainable Procurement Policy. In doing both of these, the City has an opportunity to share this system and knowledge with other commercial organizations and institutions.

Implementation Timing

Generally speaking, the timeline to reach 50% waste diversion by the end of 2015 is ambitious. What makes this more challenging is that City funding for the initiative will not be available until after the 2014 operating budget is passed (presumably in March 2014). As a result, the focus of 2013 actions will be to focus on preparation education, engagement, and internal regulatory changes. However, a budget amendment may be required in order to access basic educational and technical assistance funding.

RECOMMENDATION: Bring forward to City Council a detailed budget amendment for 2013 SWAP Implementation as part of the Solid Waste Action Plan approval process.

External Changes & Constraints

There are a number of external factors that may have a significant impact on the timeline, cost and diversion outcomes of the City's SWAP. Listed below are some of these external factors discussed in this process, along with possible risks and benefits this may have on the City of Whitehorse's waste management system.

External Changes	Risks	Benefits
Implementation of Extended Producer Responsibility (EPR) in Yukon	• May be perceived as an additional cost to business • May be a lengthy implementation time	• Greater diversion of EPR products • Lower tipping fees due to less cost burden on City • User responsible for the waste they consume
NO implementation of EPR or expanded stewardship regulations	• Recycling processors and depots reduce or discontinue collection and/or processing of non-BCR materials in Yukon • Less diversion, Yukon landfills fill faster • Increased costs to municipal and territorial taxpayers	• Costs and effort of regulatory changes are delayed
Economic downturn in commodities market	• Recycling processors and depots reduce or discontinue recycling non-BCR materials	
Increased population	• Increased pressure on all waste management activities • Landfill life shortened	• Increased revenue from tipping fees to pay for waste diversion activities
Increased waste migration and illegal dumping	• In order to avoid tipping fees, some will dispose of waste in outlying landfills (e.g. Marsh Lake, Deep Creek) or create illegal dump sites	• Increased pressure on outlying communities to enhance waste management practices
YG increases regional landfill infrastructure in other communities	• Possibly less revenue from YG communities waste to Whitehorse	• Less liability and costs for disposing of YG communities waste
YG creates a tipping fee in outlying community landfills	• Waste migration may continue further afield • Possible increased volumes come to City WMF	• Waste is handled in a professional waste management facility • Less incentive for waste migration

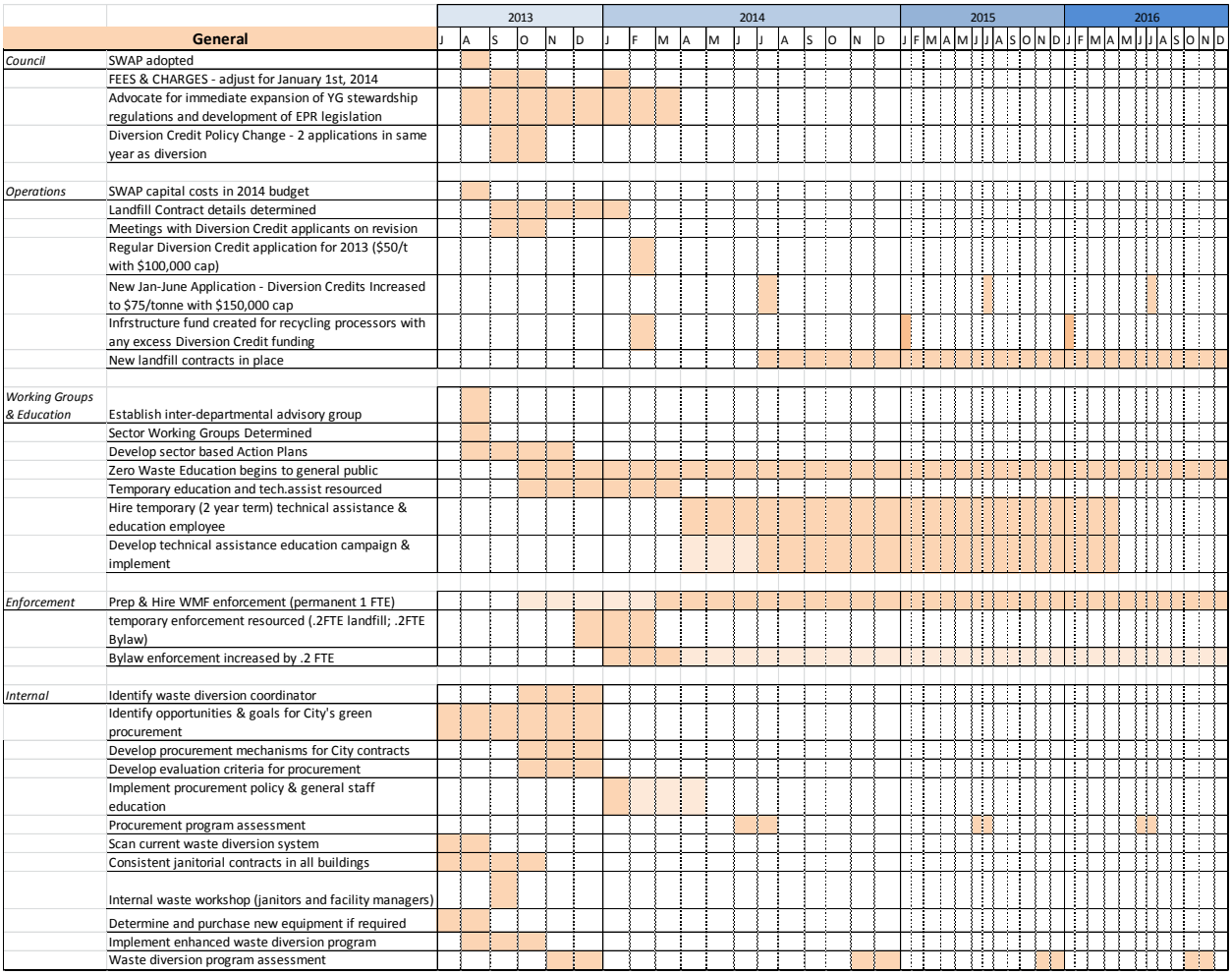
Staffing

In order to facilitate the change required in the SWAP, the City of Whitehorse reviewed the timelines and tasks and determined the resources required. Following is a chart detailing the general staff requirements, rough job description (including term of employment), and how they would be funded.

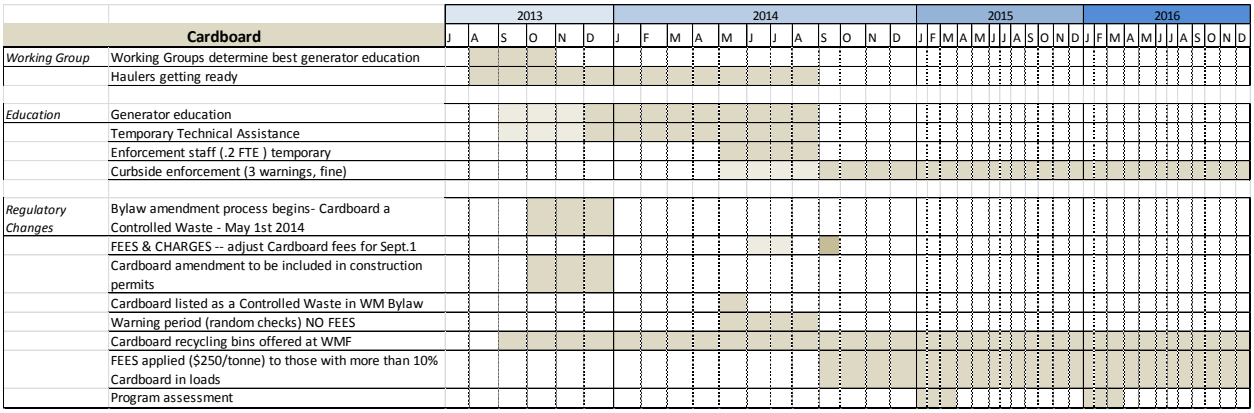
Position	Hours / Term	Description	Funding Source
Waste Diversion Coordinator	.8 FTE	Program coordinator for SWAP implementation	Tipping Fees
Organics Pilot Coordinator	1 FTE (2 year term)	Rural Residential + ICI Pilot program (Fall 2013 to Fall 2015)	2-year Capital Project
Technical Assistance & Enforcement	.7 FTE (2 year term)	ICI and C&D Technical Assistance and some warnings	2-year Capital Project
Landfill Enforcement	1 FTE	General Landfill enforcement to inspect loads at the face	Tipping Fees
Landfill Enforcement	.5 FTE (2 year term)	Transfer station education/enforcement; Reuse area; E-waste etc.	2 year Capital Project
Technical Assistance & Enforcement	.3 FTE	Water Services and other Bylaw needs	Water Services

Specific Tasks & Timeline

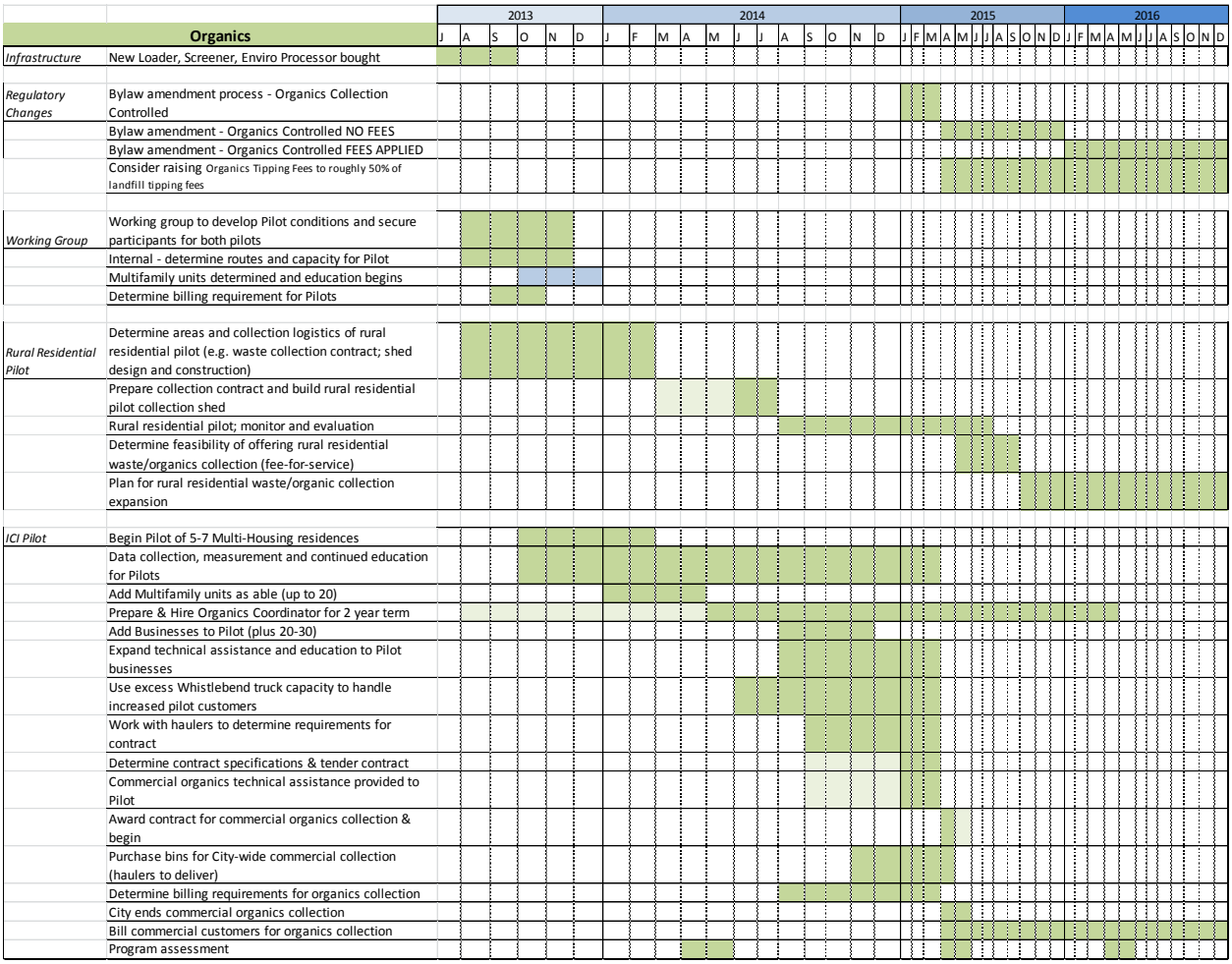
General



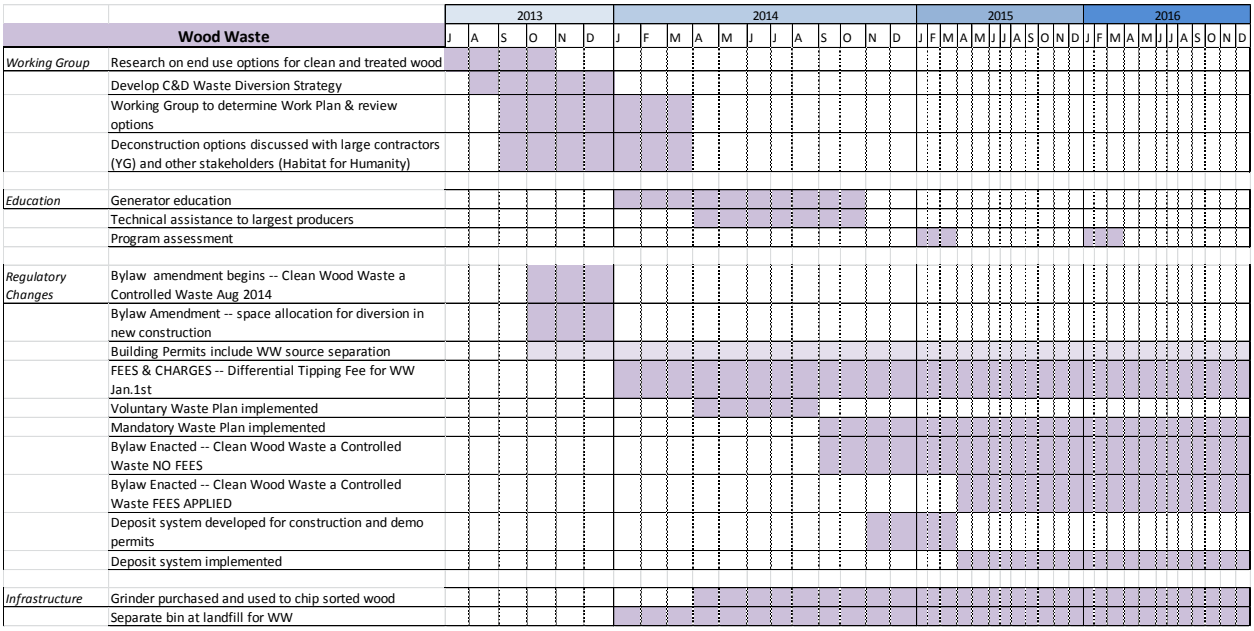
Cardboard



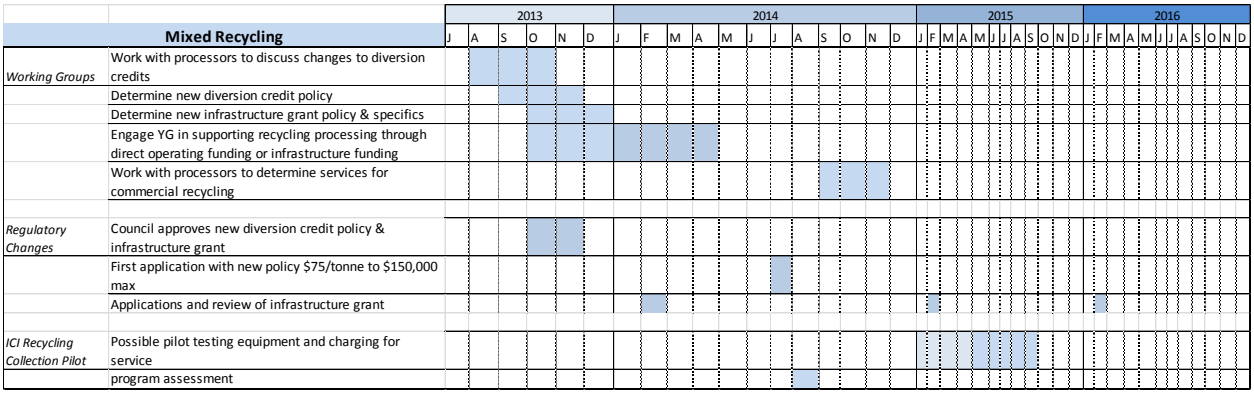
Organics



Wood Waste



Mixed Recycling



Summary

While the SWAP Summary document highlights the key strategies and recommendations for diverting 50% of Whitehorse's waste from landfill by 2015, the SWAP details and implementation document provides the context, specific costs and implementation considerations for achieving this target. Following is a review of both the SWAP summary recommendations as well as some of the detailed implementation recommendations.

SWAP Summary Recommendations

General

1. Prioritize Cardboard, Organics, and Wood Waste for diversion programming.
2. Prioritize diversion programming to the ICI and C&D sectors
3. Develop working groups for the ICI, C&D, and Multi-housing sectors to assist in program development and implementation

Cardboard

1. Create and implement waste diversion technical assistance program for commercial collection customers.
2. Increase diversion credits from $50 to $75 per tonne and increase the cap to $150,000 per year.
3. Amend the Waste Management Bylaw to include cardboard as a controlled waste in May 2014.

Organics

1. Continue to invest in our compost facility infrastructure in partnership with Yukon Government.
2. Develop a City-run progressive pilot for commercial sector organics pickup (starting with multi-housing units).
3. Develop a pilot for rural residential organics and waste pickup on a fee-for-service basis.
4. Amend the Waste Management Bylaw to make organics a controlled waste by April 2015.

Wood Waste

1. Research options for wood waste and other C&D waste in consultation with the C&D working group and create a C&D diversion strategy.
2. Review and amend permit requirements for construction and demolition to enhance source separation and reuse of clean and treated wood.
3. Amend the Waste Management Bylaw to make clean wood waste a controlled waste by September 2014.

Mixed Recycling

1. Develop a community driven Zero Waste education campaign
2. Continue to advocate for the immediate expansion of YG's current stewardship legislation (e.g. BCR & DMR) and develop a comprehensive EPR legislation that supports a financially sustainable recycling system in the Yukon.
3. Increase diversion credits for recycling processors from $50 to $75 per tonne. Unused funds from diversion credits can be allocated to a recycling infrastructure fund.
4. In partnership with stakeholders, determine the best model for collecting and charging for commercial recycling pickup.

Specific Implementation Recommendations

Throughout this document, some of the key specific implementation recommendations were as follows:

1. Review the costs, diversion rates, timelines and overall SWAP implementation plan on a yearly basis. Make adjustments with consultation of key stakeholders.

2. Incorporate SWAP implementation expenses as part of the cost adjustment required January 1, 2014 to meet to the Waste Management Cost Recovery Bylaw.

3. Create a C&D waste diversion strategy based on the analysis of the financial feasibility, landfill capacity gains and diversion potential of each diversion option. Consider doing this in partnership with YG Community Services to create rural community synergies.

4. Create a Reserve account for tipping fee revenues (that exceed the full costs of waste management) in order to ensure user fees are directly allocated to waste diversion programs and services.

5. Bring forward to City Council a detailed budget amendment for 2013 SWAP Implementation as part of the Solid Waste Action Plan approval process.

Reference

Following is a list of publications used as reference to provide further background and specific waste management information related to the development of the SWAP. These reports are available upon request.

AECOM prepared for Yukon Government, *"Yukon Recycling Review,"* January 2012.

AECOM prepared for City of Whitehorse, "*Son of War Eagle Solid Waste Management Facility: Solid Waste Management Plan 2012-2013,*" March 2013.

Cable, Bryna & Craig, Kristina, *"Solutions Through Stewardship: a review of product stewardship programs and recommended options for implementation in the Yukon,"* June 2011.

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City of Whitehorse, *"Managing Whitehorse Waste Update 2012,"* February 2012.

City of Whitehorse, *"Solid Waste Action Plan Options,"* 2013.

Federation of Canadian Municipalities: *"Getting to 50% and Beyond: Waste Diversion Success Stories from Canadian Municipalities,"* 2009.

Kristina Craig Strategic Solutions with Bryna Cable, *"The Road Map: Framework and Financial Implications of Reaching 50% Diversion by 2015 through Recycling in the Yukon,"* June 2012.

Maura Walker & Associates. "*Son of War Eagle Landfill Study: Composition of Waste From City of Whitehorse,"* January 2011.

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Organization for Economic and Cooperative Development. *"Extended Producer Responsibility: A Guidance Manual for Governments. Working Party on Pollution Prevention and Control,"* October 2000.

Solid Waste Association of North America (SWANA). "*Managing Recycling Systems*," 2009.