

Hamilton
Public Works

**Public Works
Operations & Waste Management Division
Solid Waste Management Master
Plan Review PW12004a**

Public Works Committee
April 16, 2012

Providing services that bring our City to life!

2

Overview

Integrated Waste Management System

Context


SWMMP Review

- Introduction
- Process
- Public Consultation
- Findings
 - Overview of existing system
 - Facilities
 - Gap Analysis
 - Strategic Directions
 - Systems Analysis
 - Preferred System

Steering Committee Guiding Principles

Steering Committee Recommendations

Overview of Report PW12004a Recommendations




Operations & Waste Management Division

→ Community

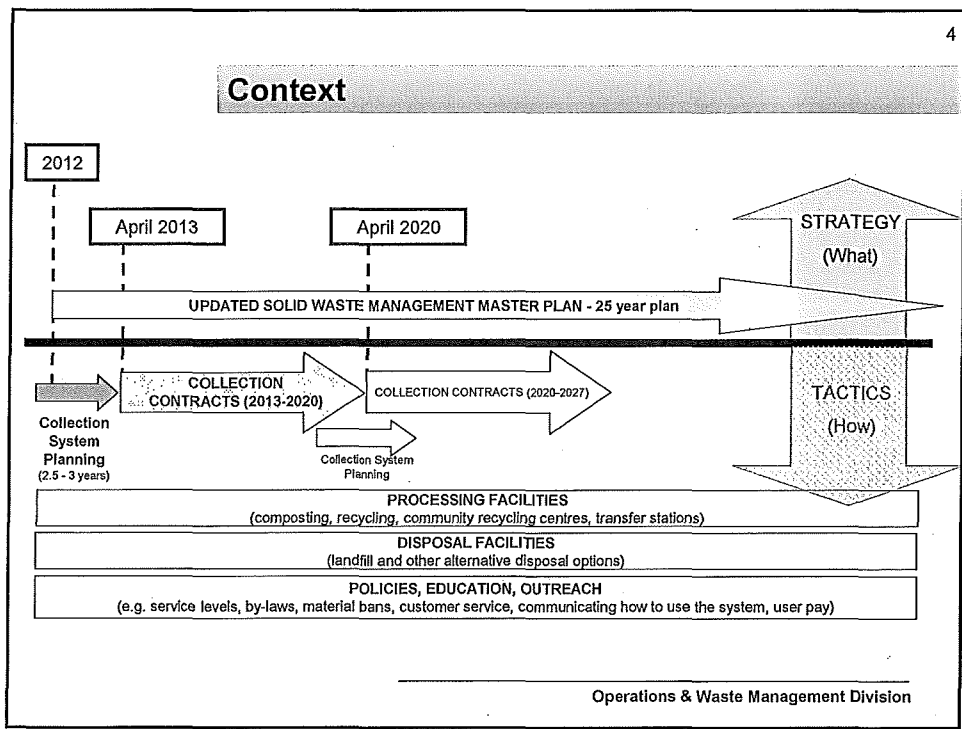
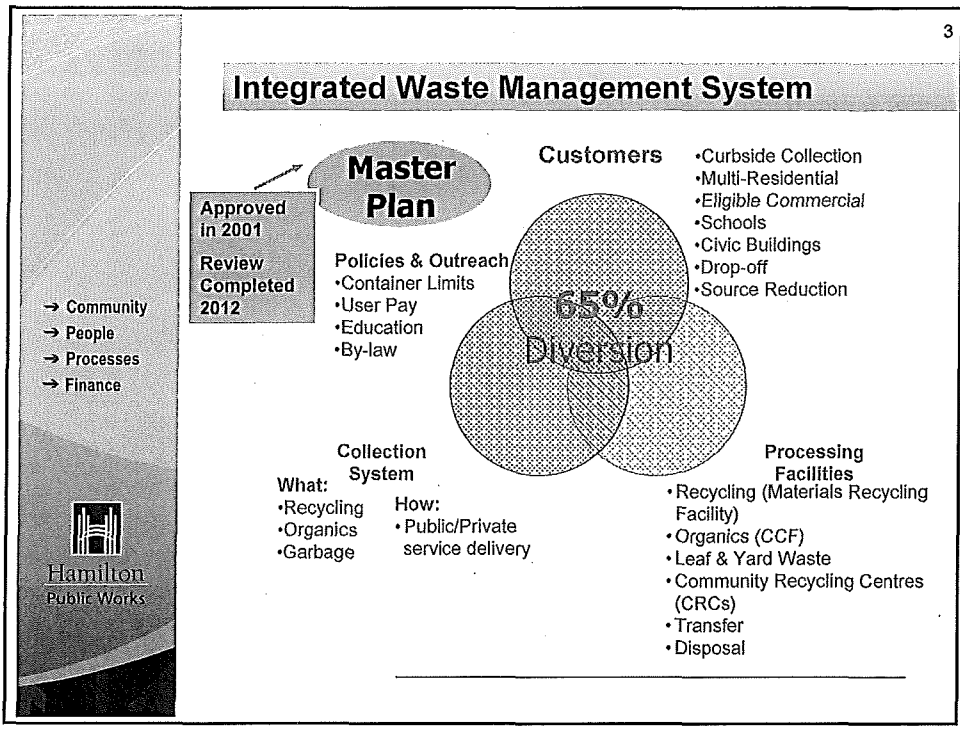
→ People

→ Processes

→ Finance



Hamilton
Public Works



7.1

5


Why Review the SWMMP

Status of the 2001 SWMMP

Many of the recommendations have been implemented:

- Preservation of landfill capacity, operational improvements
- Improved residential waste diversion from 17% to 49%
- Central Composting Facility
- Materials Recycling Facility upgrades
- Community Recycling Centres
- 3-stream collection system
- Continued promotion and education
- Lobbying of senior governments

→ Community
→ People
→ Processes
→ Finance



Hamilton
Public Works

Operations & Waste Management Division

6


Why Review the SWMMP cont'd

What's Remaining?

Outstanding recommendations from the 2001 SWMMP:

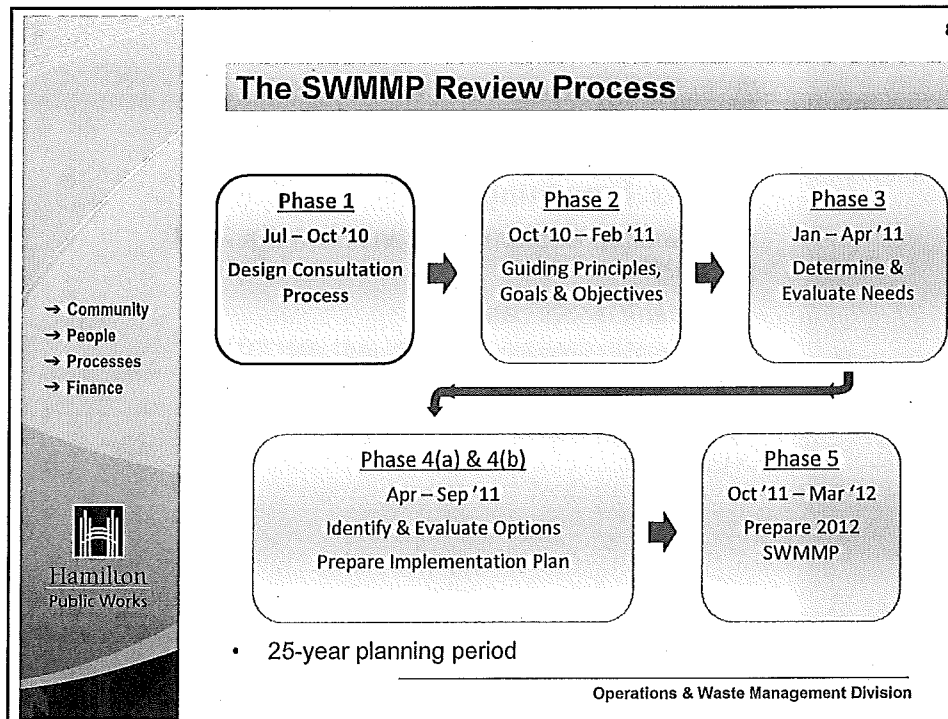
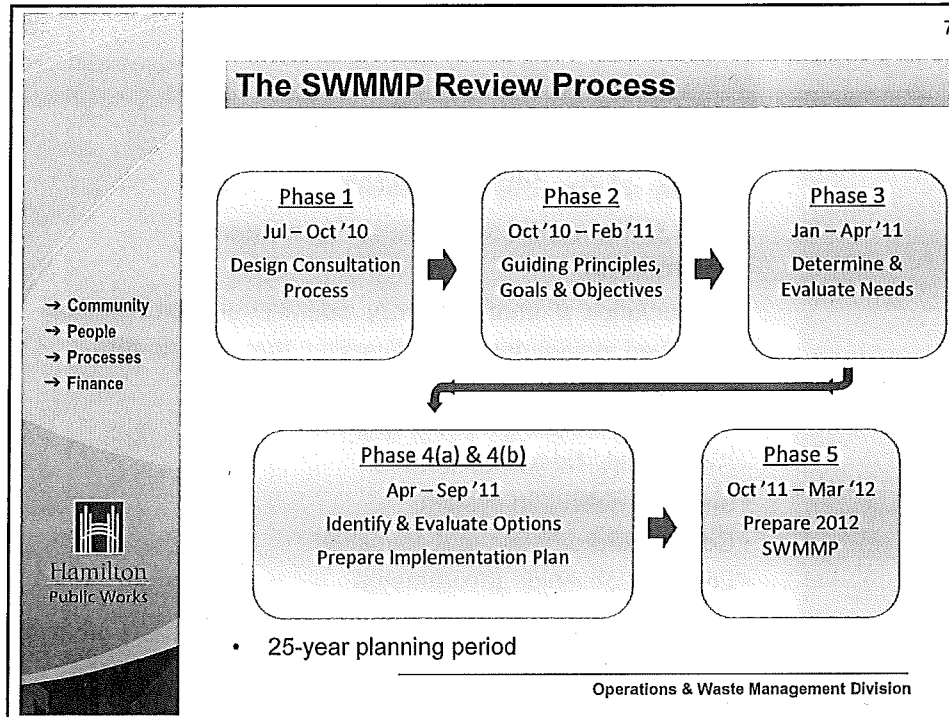
- Long term landfill capacity
- 65% waste diversion by 2008 and later 2011
- State-of-the-art Materials Recycling Facility
- Energy from Waste
- User Pay

→ Community
→ People
→ Processes
→ Finance



Hamilton
Public Works

Operations & Waste Management Division




7.1

9

Public Consultation – Overview

- Consultation process designed in Phase 1
- Surveys
 - Stakeholder scan, two online surveys
- Project website
 - Project e-mail, library, project updates
- Community Dialogue
 - Engagement of stakeholders
 - Stakeholder list, e-mail updates, meetings with community groups/councils, displays at events
- Workshops
 - Two public workshops, staff workshop

→ Community
→ People
→ Processes
→ Finance



Hamilton
Public Works


Operations & Waste Management Division

10

Public Consultation - Surveys

- Stakeholder Scan:
 - Interviews with City staff, Waste Reduction Task Force members
- Online survey on Guiding Principles, Goals and Objectives
 - Completed for Phase 2
 - 49 surveys completed
- Online survey on draft SWMMP
 - February 3 to March 7
 - 138 surveys completed
 - Draft SWMMP and survey promoted with facebook ad
 - February 7 to February 24
 - 2.9 Million impressions, 628 clicks to project website

→ Community
→ People
→ Processes
→ Finance



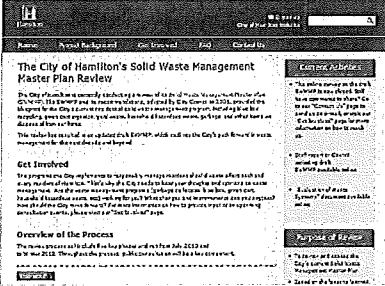
Hamilton
Public Works

Operations & Waste Management Division

11

Public Consultation – Project Website

- Central site to facilitate engagement
- Included project library, updates, library, hosted online surveys, dedicated e-mail address
- About 60 separate members of public provided feedback through dedicated e-mail address
- Website metrics:
 - 3,933 visits
 - 2,964 unique visitors
 - 11,231 page views




Operations & Waste Management Division

→ Community

→ People

→ Processes

→ Finance



12

Public Consultation – Community Dialogue

- Community Associations
 - Met with 9 community groups in Phase 2
 - Included direct outreach to approximately 115 individuals
- Stakeholder Contact List
 - 149 individuals, businesses, and community organizations
 - 12 project update e-mails distributed
- Community Groups & Community Councils
 - Presentations delivered to three community groups and to Community Councils of Ancaster, Flamborough, Dundas
 - Met with Environment Hamilton
- Displays at events
 - Fall Garden & Chrysanthemum Show
 - Upwind Downwind Conference


Operations & Waste Management Division

→ Community

→ People

→ Processes

→ Finance




13

Public Consultation – Workshops

- Public Workshop on Guiding Principles, Goals and Objectives (Jan 2011)
- Public Workshop on Gap Analysis and Options (April 2011)
- Council Committee presentation (July 2011)
- Staff workshop on Possible Options (Aug 2011)

→ Community
→ People
→ Processes
→ Finance



Hamilton
Public Works

Operations & Waste Management Division


14

The SWMMP Review Process

```

graph LR
    P1[Phase 1  
Jul – Oct '10  
Design Consultation Process] --> P2[Phase 2  
Oct '10 – Feb '11  
Guiding Principles, Goals & Objectives]
    P2 --> P3[Phase 3  
Jan – Apr '11  
Determine & Evaluate Needs]
    P3 --> P4[Phase 4(a) & 4(b)  
Apr – Sep '11  
Identify & Evaluate Options  
Prepare Implementation Plan]
    P4 --> P5[Phase 5  
Oct '11 – Mar '12  
Prepare 2012 SWMMP]
    P3 --> P2
    
```

→ Community
→ People
→ Processes
→ Finance



Hamilton
Public Works

Operations & Waste Management Division

Phase 2 Consultation

- Community input sought on Guiding Principles, Goals and Objectives
- Tools used:
 - Meetings with community groups/residents' associations
 - Public workshop on Guiding Principles, Goals and Objectives
 - Project website
 - Discussion questions
 - Survey form
 - Workshop materials

→ Community
→ People
→ Processes
→ Finance



Operations & Waste Management Division

Guiding Principles

1. The City of Hamilton must lead and encourage the changes necessary to adopt the principle of Waste Minimization. (*new*)
2. The Glanbrook Landfill is a valuable resource. The City of Hamilton must minimize residual waste and optimize the use of the City's diversion and disposal facilities. (*updated*)
3. The City of Hamilton must maintain responsibility for the residual wastes generated within its boundaries. Inter-regional facilities will be considered. (*updated*)

→ Community
→ People
→ Processes
→ Finance



Operations & Waste Management Division

17

Goals and Objectives

- Goals and objectives arranged according to three pillars of sustainability

The diagram consists of three overlapping circles. The top circle is labeled 'society', the bottom-left circle is labeled 'economy', and the bottom-right circle is labeled 'environment'. The circles overlap in the center, representing the intersection of all three pillars.

→ Community
→ People
→ Processes
→ Finance

Hamilton
Public Works

Operations & Waste Management Division

18

The SWMMP Review Process

```
graph LR; P1[Phase 1  
Jul - Oct '10  
Design Consultation Process] --> P2[Phase 2  
Oct '10 - Feb '11  
Guiding Principles, Goals & Objectives]; P2 --> P3[Phase 3  
Jan - Apr '11  
Determine & Evaluate Needs (Gap Analysis)]; P3 --> P4[Phase 4(a) & 4(b)  
Apr - Sep '11  
Identify & Evaluate Options  
Prepare Implementation Plan]; P4 --> P5[Phase 5  
Oct '11 - Mar '12  
Prepare 2012 SWMMP];
```

- 25-year planning period

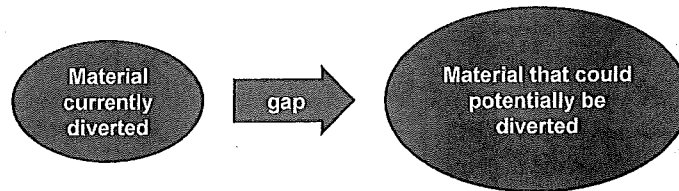
→ Community
→ People
→ Processes
→ Finance

Hamilton
Public Works

Operations & Waste Management Division

Gap Analysis

- Used to determine and evaluate Hamilton's waste management needs
- Examined Hamilton's current waste management system
- Reviewed capacity of waste management facilities
- Prepared waste composition model
- Identified potential to increase diversion

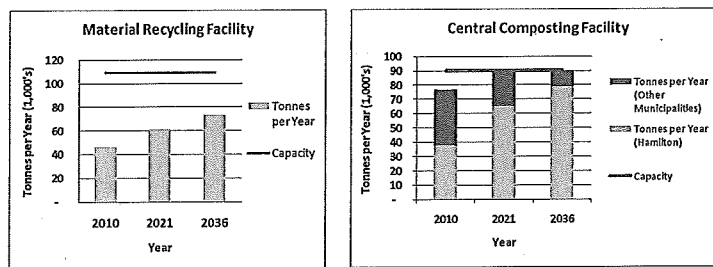


Operations & Waste Management Division

- Community
- People
- Processes
- Finance



Gap Analysis – Facility Review



- Leaf and yard waste composting facility – sufficient capacity
- TS/CRC's - sufficient capacity, although have space limitations from operations perspective (e.g., traffic flow)

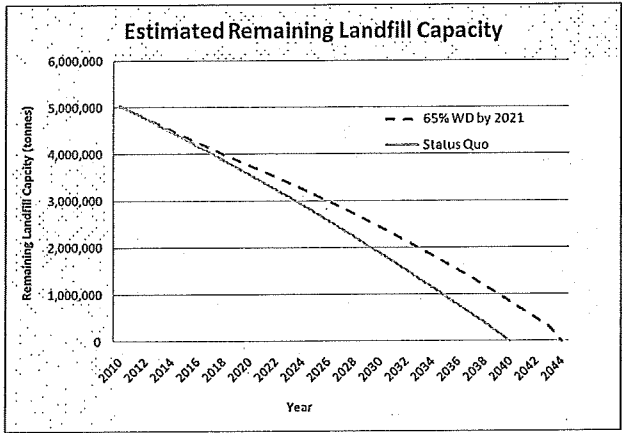
Operations & Waste Management Division

- Community
- People
- Processes
- Finance



Gap Analysis – Facility Review

- Community
- People
- Processes
- Finance



Operations & Waste Management Division

Current Diversion and Disposal Rates

- Community
- People
- Processes
- Finance



Residential Diversion Rate: 49%

Tonnes diverted: 106,200

Tonnes disposed: 110,700

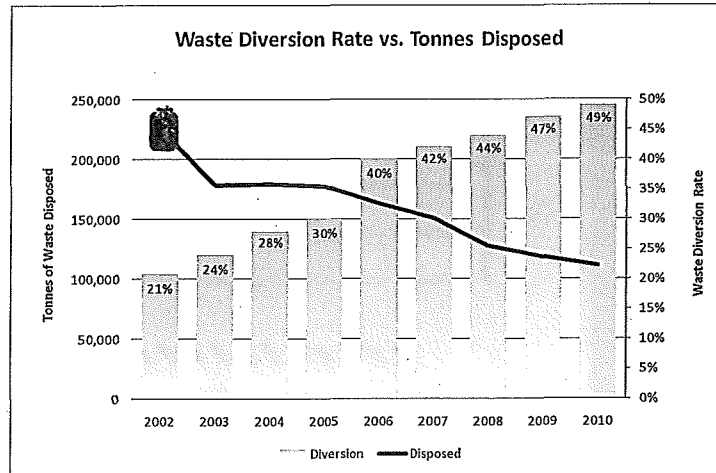
| Category | Diversion rate | Tonnes diverted | Tonnes disposed |
|--------------------------|----------------|-----------------|-----------------|
| <i>Single-Family</i> | 55% | 98,400 | 82,100 |
| <i>Multi-Residential</i> | 21% | 7,700 | 28,600 |

Reaching 65% diversion = 36,000 additional tonnes out of disposal

Operations & Waste Management Division

Gap Analysis – Current Diversion

- Community
- People
- Processes
- Finance



Operations & Waste Management Division

Gap Analysis – Diversion Potential

- Community
- People
- Processes
- Finance



| Waste Stream Category | Total Residential Sector | | Single Family | | Multi Family | |
|-------------------------|-----------------------------|---|----------------------------------|---|----------------------------------|---|
| | Possible Additional Tonnage | Increased Diversion Above Existing Diversion Rate (Percentage Points) | Corresponding Additional Tonnage | Increased Diversion Above Existing Diversion Rate (Percentage Points) | Corresponding Additional Tonnage | Increased Diversion Above Existing Diversion Rate (Percentage Points) |
| Paper | 2,212 | 1.02% | 1,049 | 0.48% | 1,163 | 0.54% |
| Paper Packaging | 7,370 | 3.40% | 5,124 | 2.36% | 2,246 | 1.04% |
| Plastics | 3,389 | 1.56% | 2,224 | 1.03% | 1,145 | 0.53% |
| Metals | 2,850 | 1.31% | 2,134 | 0.98% | 715 | 0.33% |
| Glass | 280 | 0.13% | 0 | 0 | 280 | 0.13% |
| Household Special Waste | 229 | 0.11% | 200 | 0.09% | 29 | 0.01% |
| Organics | 15,741 | 7.26% | 9,059 | 4.18% | 6,683 | 3.08% |
| Other Materials | 71 | 0.03% | 32 | 0.01% | 40 | 0.02% |
| WEEE | 1,910 | 0.88% | 1,524 | 0.70% | 386 | 0.18% |
| Total | 34,052 | 15.70% | 21,365 | 9.85% | 12,687 | 5.85% |


- Based on existing programs and optimum capture rates (85% for blue box and organics and 75% for other wastes)

Operations & Waste Management Division

25

Gap Analysis

→ Community
→ People
→ Processes
→ Finance




Questions?

Operations & Waste Management Division

26

The SWMMP Review Process

→ Community
→ People
→ Processes
→ Finance

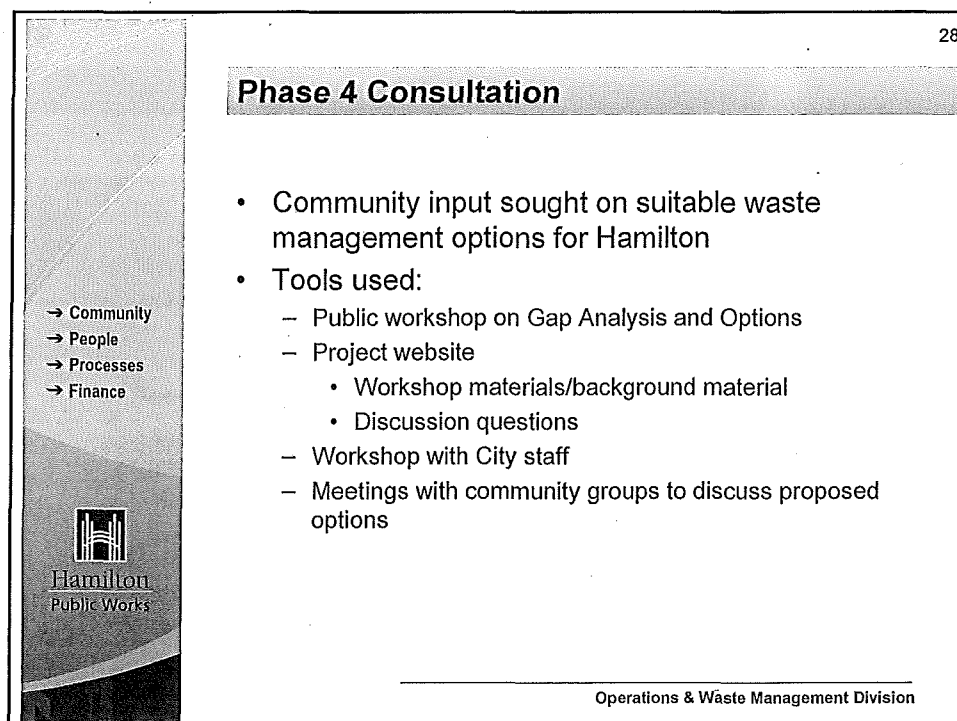
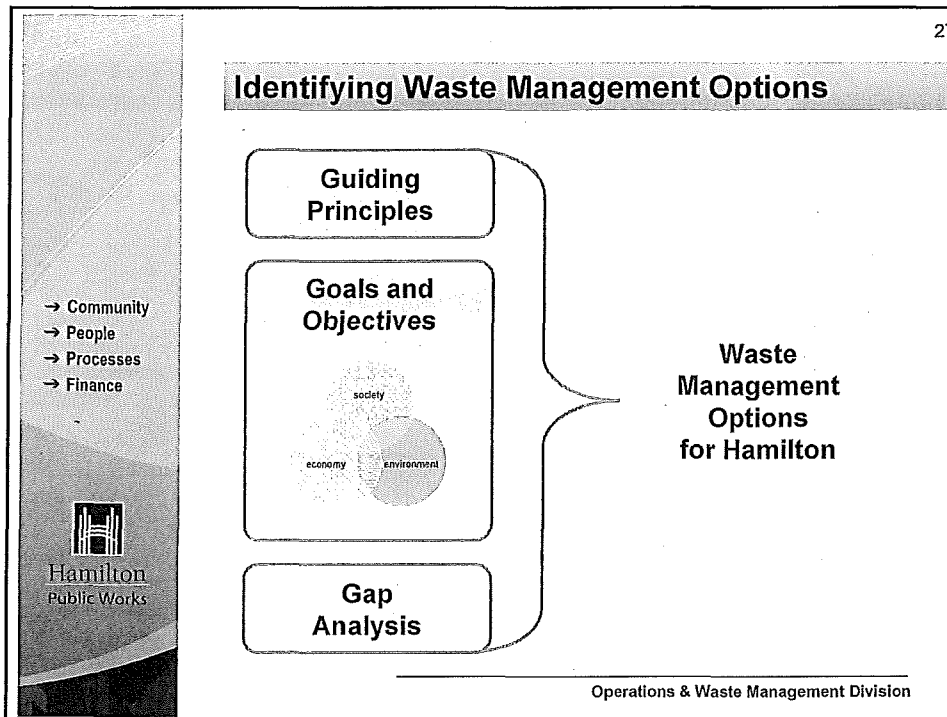


```
graph LR; P1["Phase 1  
Jul - Oct '10  
Design Consultation  
Process"] --> P2["Phase 2  
Oct '10 - Feb '11  
Guiding Principles,  
Goals & Objectives"]; P2 --> P3["Phase 3  
Jan - Apr '11  
Determine &  
Evaluate Needs"]; P3 --> P4["Phase 4(a) & 4(b)  
Apr - Sep '11  
Identify & Evaluate Options  
Prepare Implementation Plan"]; P4 --> P5["Phase 5  
Oct '11 - Mar '12  
Prepare 2012  
SWMMP"];
```

- 25-year planning period

Operations & Waste Management Division

7.1



31

Approaches to Waste Diversion

Enhanced

Status Quo +

The diagram for 'Enhanced' status quo contains 10 circular nodes arranged in a grid-like pattern:

- Targeted Education
- Incentives
- New Materials in Recycling Programs
- Commercial Sector
- Multi-Residential
- Construction & Renovation Waste
- Reducing Garbage Collection Frequency
- EPR Lobbying
- Multi-Municipal Processing

Operations & Waste Management Division

→ Community
→ People
→ Processes
→ Finance

Hamilton
Public Works

32

Approaches to Waste Diversion

Maximized

Status Quo +

The diagram for 'Maximized' status quo contains 14 circular nodes arranged in a grid-like pattern:

- Targeted Education
- Incentives
- Zero Waste at Municipal Buildings
- Additional Enforcement
- New Materials in Recycling Programs
- Commercial Sector
- Multi-Residential
- Event Days
- New Reuse Centre/Store
- Construction & Renovation Waste
- Reducing Garbage Collection Frequency
- Automated Single Stream Recycling
- EPR Lobbying
- Multi-Municipal Processing

Operations & Waste Management Division

→ Community
→ People
→ Processes
→ Finance

Hamilton
Public Works

Approaches to Waste Disposal

- Community
- People
- Processes
- Finance



- Continue with Glanbrook Landfill
- Examine Alternative Disposal Technologies (ADT)
 - Waste Conversion
(e.g., incineration, gasification, pyrolysis, etc)
 - Mechanical/Biological Treatment
(e.g., waste stabilization, front-end processing/sorting)

System Performance – Waste Diversion

- Community
- People
- Processes
- Finance



| Waste Diversion Scenario | Estimated Diversion Rate by 2021/ Landfill Closure Date | 2012 – 2036 Estimated Total Cost for Diversion |
|--------------------------|---|--|
| Status Quo | 55% 2040 | \$642 M |
| Enhanced | 65% 2044 | \$710 M – \$733 M |
| Maximized | 75% 2048 | \$723 M – \$750 M |

System Performance – Waste Disposal

| Waste Disposal Scenario | Estimated Glanbrook Closure Date | 2012 – 2036 estimated total cost (Disposal) |
|-------------------------|----------------------------------|---|
| Glanbrook | 2044 | \$501 M |
| ADT | 2053 | \$583 M |

Assumptions

- 65% waste diversion by 2021
- ADT would take until at least 2027 to be operational (7 year planning process, 3 year construction)

Operations & Waste Management Division

- Community
- People
- Processes
- Finance



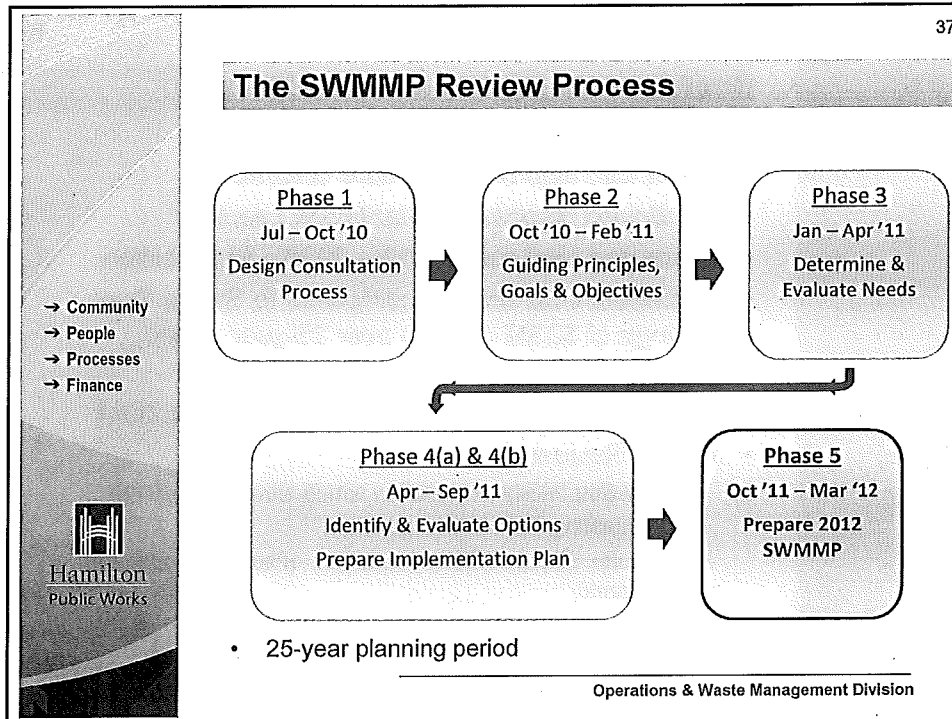
Summary of System Costs

| Scenario | Diversions Component Cost | Disposal Component Cost | 2012-2036 Total System Cost |
|--|---------------------------|-------------------------|-----------------------------|
| Status Quo + Landfill (Glanbrook Landfill) | \$642M | \$592M | \$1,234M |
| Enhanced + Landfill | \$710M | \$501M | \$1,211M |
| Enhanced + ADT by 2027 | \$710M | \$583M | \$1,293M |
| Maximized + Landfill | \$750M | \$455M | \$1,206M |
| Maximized + ADT | \$750M | \$539M | \$1,289M |

Operations & Waste Management Division

- Community
- People
- Processes
- Finance





- Community
- People
- Processes
- Finance



38

Phase 5 Consultation

- Community input sought on draft SWMMP
- Tools used:
 - Project website
 - Draft SWMMP and staff report posted
 - Online survey
 - Facebook ad promoting draft SWMMP and opportunity for feedback
 - Meeting with community/environmental groups
- SWMMP updated based on feedback

Sponsored See All

Hamilton's Waste Review

Check out the new plan to deal with Hamilton's waste. Have your say about the changes being considered. Click to visit today!

Operations & Waste Management Division

- Community
- People
- Processes
- Finance



Preferred Waste Management System

- Community
- People
- Processes
- Finance



- Enhanced approach to waste diversion
- Continued disposal at Glanbrook Landfill
- Estimated total cost (2012 – 2036): \$1.21 billion
- Estimated cost change compared to Status Quo: savings of \$23M (or 2%) over 25-year period, depending on options implemented
- Glanbrook capacity extended from 2040 to 2044
- Future Reviews:
 - Recycling facility (expansion, single stream recycling)
 - Composting Facilities (expansion)
 - Transfer Station/CRC's (expansion of services, optimum locations)
 - Alternative disposal capacity

Study Recommendations

- Community
- People
- Processes
- Finance



1. Implement "enhanced approach" to waste diversion:
 - Targeted education;
 - Focusing on the multi-residential and commercial sectors;
 - Managing construction and renovation materials;
 - Adding materials to the recycling programs where feasible;
 - Continued lobbying for Extended Producer Responsibility;
 - Municipal processing partnerships; and
 - Reduced garbage collection frequency in 2020.


7.1

41

Study Recommendations

2. Feasibility study in 2013 of expanding CCF capacity.
3. Feasibility study in 2017 of Single Stream processing, expansion of MRF capacity.
4. TS/CRC operational review and needs analysis in 2017.
5. Five Year Review of the SWMMP in 2017.
6. Use the Glanbrook Landfill for disposal for 5 years, consider alternative disposal capacity in next SWMMP review.

→ Community
→ People
→ Processes
→ Finance



Hamilton
Public Works


Operations & Waste Management Division

42

Study Recommendations

7. Merge advisory roles of SWMMP Steering Committee and Waste Reduction Task Force.
8. When implementing recommendations, consideration to be given to potential impacts on illegal dumping.

→ Community
→ People
→ Processes
→ Finance



Hamilton
Public Works


Operations & Waste Management Division

7.1

43

Study Recommendations

→ Community
→ People
→ Processes
→ Finance



Hamilton
Public Works


Questions?

Operations & Waste Management Division

44

Guiding Principles for the 2012 SWMMP

→ Community
→ People
→ Processes
→ Finance



Hamilton
Public Works

As recommended by the Steering Committee,

1. The City of Hamilton must lead and encourage the changes necessary to adopt the principle of *Waste Reduction*. (*new*)
2. The Glanbrook landfill is a valuable resource. The City of Hamilton must minimize residual waste and optimize the use of the City's diversion and disposal facilities.
3. The City of Hamilton must maintain responsibility for the residual wastes generated within its boundaries. Inter-regional *opportunities* will be considered.

Operations & Waste Management Division

SWMMP Recommendations

As recommended by the Steering Committee,

- R1. A waste diversion target of 65% will be maintained
- R2. Implement Enhanced Waste Diversion – this may include targeted education, focusing on multi-residential and the commercial sectors, managing construction and renovation materials, adding materials to the blue box where feasible, continued lobbying for Extended Producer Responsibility (EPR), municipal and corporate opportunities and partnerships, and pursue current and pending opportunities for collection efficiencies in 2020

Operations & Waste Management Division

- Community
- People
- Processes
- Finance



SWMMP Recommendations (cont'd)

- R3. Undertake a feasibility study in 2013 of expanding capacity and opportunities at the Central Composting Facility
- R4. Undertake a feasibility study in 2015 of Single Stream processing and expansion of capacity at the Municipal Recycling Facility (MRF)
- R5. Undertake an operational review and needs analysis in 2017 of the Transfer Stations and Community Recycling Centres
- R6. Optimize the capacity of the Glanbrook Landfill site which may include consideration of alternative disposal technologies no later than the next five (5) year review

Operations & Waste Management Division

- Community
- People
- Processes
- Finance



SWMMP Recommendations (cont'd)

- Community
- People
- Processes
- Finance



- R7. Undertake a Five (5) Year Review of the SWMMP in 2017
- R8. The advisory roles of the SWMMP Steering Committee and the Waste Reduction Task Force be merged *when appropriate*
- R9. On the implementation of Recommendations 1 to 7 consideration will be given to the potential impacts on illegal dumping
- R10. Staff will report to Council on the progress of implementing the SWMMP recommendations on an annual or as needed basis
- R11. The 2001 SWMMP be rescinded and replaced with the 2012 SWMMP

Operations & Waste Management Division

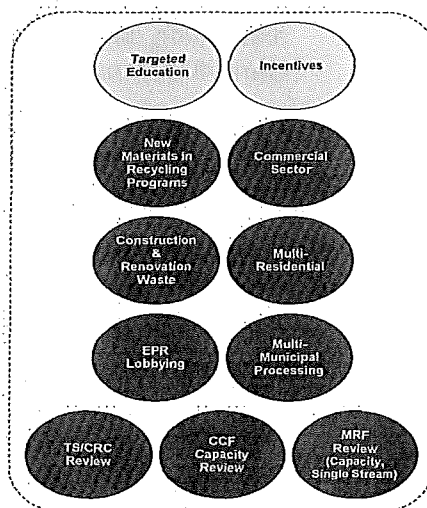
SWMMP Recommendations (cont'd)

System Recommended by Steering Committee

- Community
- People
- Processes
- Finance



Status Quo +



Operations & Waste Management Division

Diversion Rate, Landfill Life & Cost of Systems

| Scenario | Diversion Rate (by 2021) | Expected Life of the Glanbrook Landfill | 2012-2036 Total System Cost |
|--|--------------------------|---|-----------------------------|
| Status Quo + Landfill (Glanbrook Landfill) | 55% | 2040 | \$1,234M |
| Enhanced + Landfill | 65% | 2044 | \$1,211M |
| Enhanced + ADT by 2027 | 65% | 2053 | \$1,293M |
| Maximized + Landfill | 75% | 2048 | \$1,206M |
| Maximized + ADT | 75% | 2060 | \$1,289M |
| Recommended from Steering Committee | 65% | 2044 | \$1,235M |

Operations & Waste Management Division

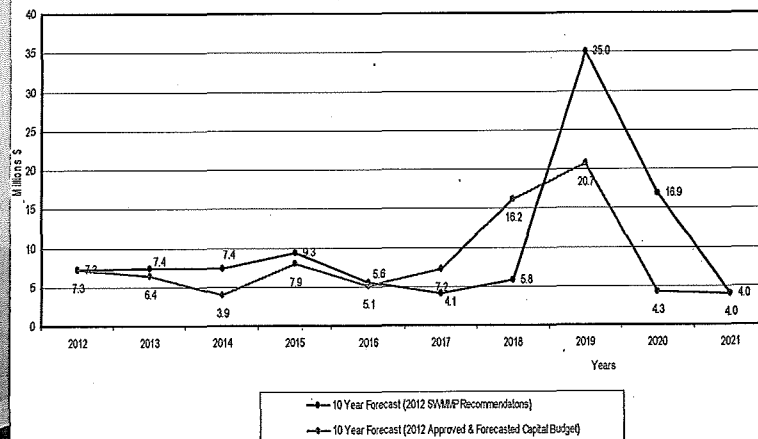
- Community
- People
- Processes
- Finance



Hamilton
Public Works

Capital Budget

Solid Waste Management Master Plan Review - Capital Comparison



Operations & Waste Management Division

- Community
- People
- Processes
- Finance



Hamilton
Public Works

Operating Budget

Operating Budget Impacts 2012-2020

| Description | Implementation Year | Annualized Cost |
|---|---------------------|-------------------|
| Commercial Green Cart Program | 2012 - 2013 | \$140,000 |
| Festivals & Special Events Diversion (PW08057a) | 2013 | \$ 40,000 |
| Construction & Renovation Materials Recycling Program | 2014 - 2015 | \$350,000 |
| Multi-Residential Targeted Education | 2013 - 2014 | \$ 85,000 |
| Total Annualized Impact of Recommended System | - | \$ 615,000 |

Operations & Waste Management Division

- Community
- People
- Processes
- Finance



Implementation Schedule

| Description | Completion Year | | | | | | | | | | |
|-------------------------------------|-----------------------------|----|----|----|----|----|----|----|----|----|----|
| | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| 1. Additional Diversion | | | | | | | | | | | |
| a) Targeted Education | Ongoing with current system | | | | | | | | | | |
| b) Incentives | Ongoing | | | | | | | | | | |
| c) Focus on commercial sector | X | X | X | | | | | | | | |
| d) Residential C&R materials | | X | | | | | | | | | |
| e) Focus on multi-residential | X | X | | | | | | | | | |
| f) New materials to programs | Ongoing as markets develop | | | | | | | | | | |
| g) Continued EPR | Ongoing | | | | | | | | | | |
| h) Single Stream Recycling | | | | | | | | | | | |
| Feasibility Review | | | | X | | | | | | | |
| Implementation | | | | | | | X | X | X | | |
| 2. MRF Lifecycle Replacement | | | | | | | X | X | X | | |
| 3. CCF Expansion | | | | | | | | | | | |
| a) Feasibility Study | | X | | | | | | | | | |
| b) Implementation | | | X | X | | | | | | | |

Operations & Waste Management Division

- Community
- People
- Processes
- Finance



Implementation Schedule

| Description | Completion Year | | | | | | | | | | |
|---|--------------------------------|----|----|----|----|----|----|----|----|----|----|
| | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| 4. Collection System Review | | | | | | X | X | X | | | |
| 5. Transfer Stations & CRCs | | | | | | | | | | | |
| a) Capacity/Location needs analysis | | | | | | X | | | | | |
| b) Updates/additions | | | | | | | X | X | X | | |
| 6. Continued use of Glanbrook Landfill | Ongoing during planning period | | | | | | | | | | |
| LANDFILL SITE SELECTION | | | | | | | | | | | |
| 7. Alternative Disposal Technologies | | | | | | | | | | | |
| a) Review | No later than 2017 | | | | | | | | | | |
| b) Implementation | | | | | | X | X | X | X | X | X |
| 8. SWMMP Maintenance | | | | | | | | | | | |
| a) Establish updated advisory committee | X | | | | | | | | | | |
| b) Annual Progress Report on Implementation | X | X | X | X | X | X | X | X | X | X | X |
| c) Five Year Review of SWMMP | | | | | | X | | | | | X |

Operations & Waste Management Division

- Community
- People
- Processes
- Finance



Hamilton
Public Works

Overview of PW12004a Recommendations

- (a) Receive report PW12004a;
- (b) Approve 2012 SWMMP Guiding Principles and Recommendations from the Steering Committee;
- (c) & (d) Disband the SWMMP Steering Committee and the Waste Reduction Task Force and replace with a Waste Management Advisory Committee in accordance with the Terms of Reference in Appendix G;
- (e) The General Manager of Public Works bring forward recommended projects in future capital and operating budgets at appropriate times;
- (f) The General Manager of Public Works is directed to discuss and negotiate inter-municipal opportunities and report back; and
- (g) Appropriate amendments be undertaken to the Solid Waste Management By-law 09-067 to implement recommendations (commercial green cart program).

Operations & Waste Management Division

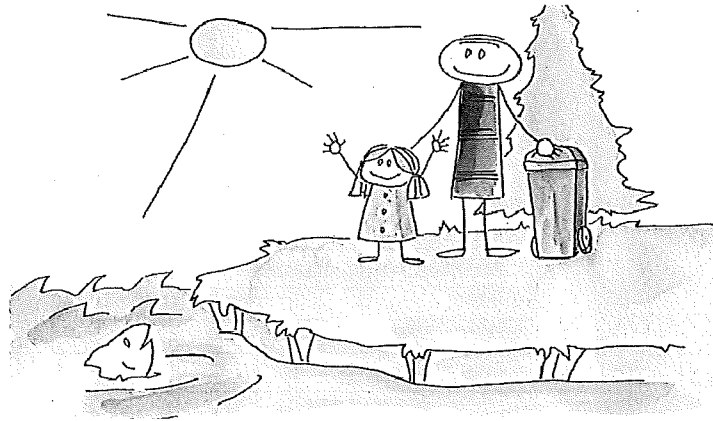
- Community
- People
- Processes
- Finance



Hamilton
Public Works

7.1

Questions?



- Community
- People
- Processes
- Finance



Hamilton
Public Works

Operations & Waste Management Division