

# **PHASE A REPORT**

Integrated Waste  
Management Study

THE CITY OF KINGSTON

(APPROVED BY CITY OF KINGSTON  
COUNCIL ON JULY 15, 2008)

PROJECT NO. 1018165

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REPORT TO

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City of Kingston  
216 Ontario Street  
Kingston ON, K71 2Z3**

FOR

**City of Kingston**

ON

**Integrated Waste Management Study**

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**July 15, 2008**

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# PHASE A REPORT

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## 1.0 REPORT INTRODUCTION AND BACKGROUND

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### 1.1 Study Background

The City of Kingston is interested in identifying opportunities to increase the amount of waste currently being diverting from landfill through its recycling program by adding an organics management component. This new component will be considered in the context of expanding the integrated waste management system, designed to further conserve resources, reduce environmental impacts and greenhouse gas emissions, produce energy and reduce the overall dependence on landfill disposal. Jacques Whitford was retained in 2006 to assist the City with the development of a long term strategy to manage municipal organics and residual solid waste. To date, Phase A has been completed, the results of which are described in this report.

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### 1.2 Overview of Study Work Plan

In order to complete the study in a logical and step-wise fashion, the study has been broken down into four phases. Each of the phases has a number of steps that have been or will be followed as part of the development of a sustainable, long-term waste management system.

- 🗑️ Phase A – Definition of Long-term Waste Management System Objectives
  - Step 1 – Data Collection and Compilation
  - Step 2 – Define Future Waste Management System Goals and Objectives
  - Step 3 – Needs / Gap Analysis
- 🗑️ Phase B – Identification of Preferred Long-term Management System Approach
  - Step 4 – Identification and Description of Management System Options
  - Step 5 – Development of Evaluation Methodology and Criteria for Management System Options
  - Step 6 – Evaluation of Management System Options and Identification of Preferred Approach
  - Step 7 – Decision on Future Management System Approach
- 🗑️ Phase C – Identification of Preferred System Technology and Practices
  - Step 8 – Request for Information (RFI)
  - Step 9 – Request for Proposals (RFP)
- 🗑️ Phase D – Development of Preferred System Implementation Strategy
  - Step 10 – Recommendations on Collection and Processing Contracts and Agreements
  - Step 11 – Identification of Next Step Implementation Activities

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### 1.3 Purpose of Phase A Report

The purpose of the Phase A report is to assemble all the relevant information needed to move forward with Phase B of the study. Phase A involved data collection, compilation and review to establish the baseline conditions followed by the development of long-term waste management system objectives and an assessment of the current (baseline) systems ability to achieve those objectives.

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## 2.0 STEP 1 RESULTS – DATA COLLECTION & COMPILATION

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### 2.1 Planning Horizon

The planning period used for this study is from 2006 – 2031.

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### 2.2 Overview of Kingston Environment

In January 1998 the city of Kingston and the townships of Kingston and Pittsburgh amalgamated to form the new City of Kingston which is illustrated below. The former City of Kingston is a maturing inner urban area with a built-up core and features significant heritage resources. The surrounding area features significant agricultural resources which contribute to the economy. Figure 2-1 illustrates the boundaries of the new city of Kingston.

In 2006, the population of Kingston was reported to be 117,207 with Kingston CMA (including Frontenac Islands, Kingston, Loyalist Township and South Frontenac Townships) having a population of 152, 358. The population of Kingston grew by 2.6% between 2001 and 2006<sup>1</sup>. The Urban Growth Strategy Final Report (July, 2004) projects the population to increase to between 147,000 (medium projections) and 164,000 (high projections) in the next 25 years<sup>2</sup>. The consultant used by the City of Kingston concluded that the medium projection was the most likely scenario and updated the population and housing projections based on the actual building permit activity that had taken place since the original projections were produced. They estimate a population in 2026 of 146,682 persons (institutional and non-institutional population).

Age demographics mirror those found across Canada

- 18% - 0-14 yrs,
- 14% - 15-24 yrs,
- 30% - 25-44 yrs,
- 24% - 45-64 yrs,
- 14% - 65+ yrs<sup>3</sup>

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<sup>1</sup> Statistics Canada. 2007. *Kingston, Ontario (table). 2006 Community Profiles*. 2006 Census. Statistics Canada Catalogue no. 92-591-XWE. Ottawa. Released March 13, 2007

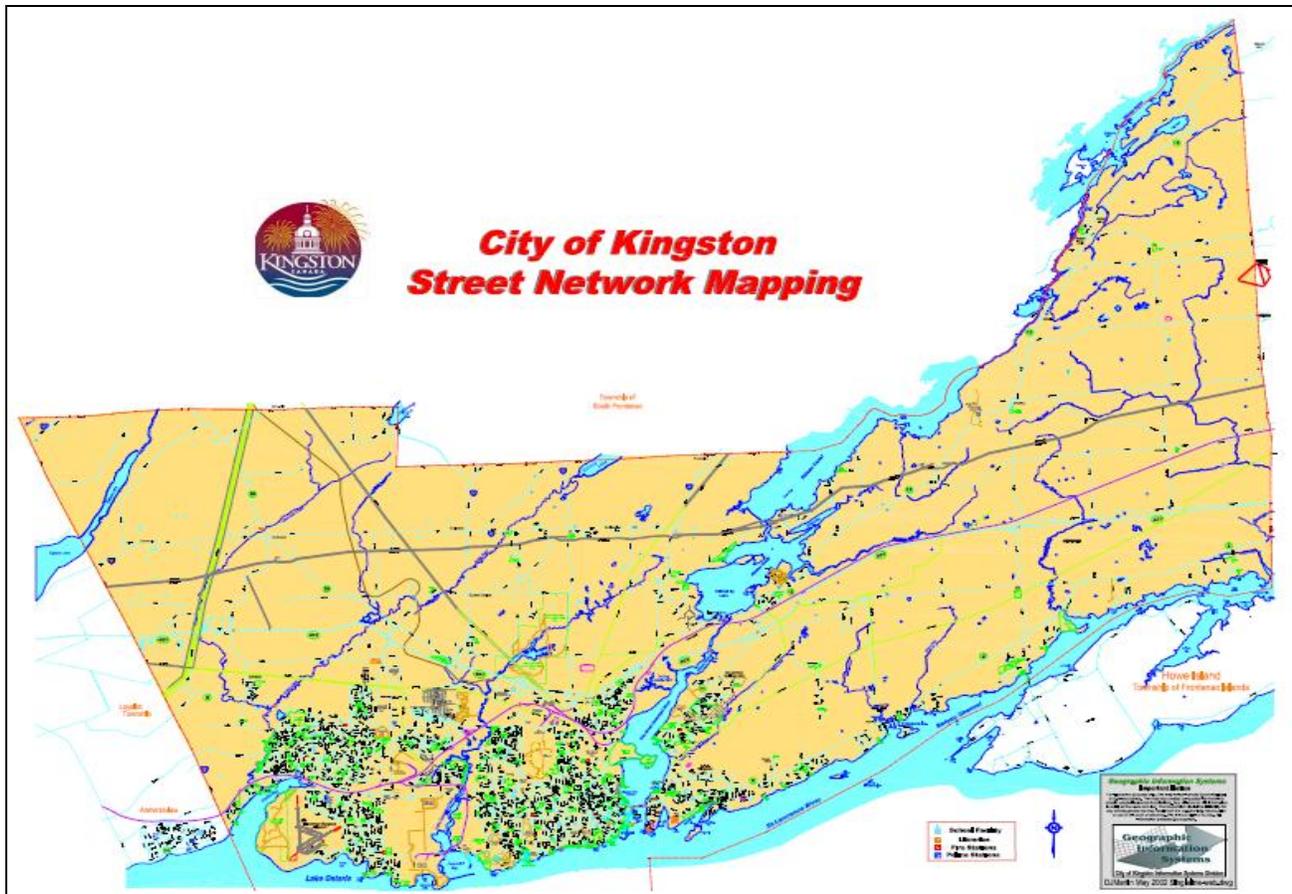
<sup>2</sup> Background document for the City of Kingston Urban Growth Strategy Terms of Reference

<sup>3</sup> Kingston Economic Development Corporation – Demographics Profile 2004

The City of Kingston has a diverse mix of public and private companies which make a significant contribution to the local economy as well as assisting Kingston to become a leader in knowledge based industries. There are a number of educational institutions – Queens University, Royal Military College and St. Lawrence College. These institutions, along with private companies, are in the forefront of developing new and emerging technologies, biotechnology and R&D.

The combination of stable, balanced employment, a vibrant downtown core, an active waterfront and many other amenities make Kingston a very attractive place to live. Residents commented on these qualities during the public consultation process for the Official Plan Review.<sup>4</sup>

**Figure 2-1 Municipal Boundaries of the City of Kingston<sup>5</sup>**



### 2.3 Relevant Municipal Policies & Priorities

The City of Kingston is currently undertaking a review of their Official Plan and Zoning By-law. Since amalgamation of the City of Kingston, the Township of Kingston and the Township of Pittsburg in 1998, three official plans have been in use; these will be replaced with a single, integrated and updated Official Plan once it has been approved. The Urban Growth Strategy Final Report (July, 2004) is one of the main documents pertaining to the Official Plan. The planning period used for the Integrated Waste Management Study is 25 years.

<sup>4</sup> City of Kingston Official Plan Review Public Consultation on Issues and Options Public Feedback Summary Report, 2006

<sup>5</sup> [www.cityofkingston.ca/maps](http://www.cityofkingston.ca/maps)

Since amalgamation, the City of Kingston has been operating with the original waste management by-laws for each previous municipality. Consolidation of the waste by-laws falls outside of the scope of the review of the Official Plan/Zoning By-laws.

The City of Kingston commissioned a study on “City Owned Industrial Land Strategy” as a precursor to the review of the Official Plan. According to the study<sup>6</sup>, the City has enough industrial land to satisfy the demands of future industrial growth in Kingston. Industrial areas in each former municipality allow for waste disposal and/or recycling. There are 2,940 acres of land designated as “industrial” in Kingston; the City owns 152 acres of vacant and serviced land within designated industrial parks.

In 2001, Kingston City Council endorsed the City of Kingston becoming a member of the Federation of Canadian Municipalities (FCM) Partners in Climate Protection Program (PCP). A corporate greenhouse gas (GHG) inventory (baseline year 2000) indicated that the Corporation of the City of Kingston spends approximately \$6.2 Million dollars annually on energy and generates approximately 27,089 tonnes of GHG, and the community GHG inventory indicates that the community of the City of Kingston spends approximately \$340 Million dollars annually on energy and generates approximately 1.4 Million tonnes of GHG emissions. The Partners in Climate Protection Program was designated as a key project in addressing the FOCUS Kingston strategic priority on improved air quality, and aligns the City of Kingston with the Federal government’s strategic direction with respect to the Kyoto Protocol and reductions in Canada’s greenhouse gas emissions and therefore may also provide access to funding opportunities. The GHG reduction policy was officially adopted by council on June 22, 2004 with direction for staff to develop corporate and community action plans in accordance with the Partners in Climate Protection Program that will achieve greenhouse gas emission reductions targets of 25% for the corporation and 10% for the community below the baseline year, by the year 2014, and to aggressively pursue FCM Green Municipal Enabling Funds (GMEF) and other funding opportunities to develop a Local Action Plan (LAP) for achieving Corporate and Community greenhouse gas emission reduction targets.

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## 2.4 Existing Kingston Waste Management System

### Facts and Figures

- 🗑 Population in 2006 of 117,207 projected to increase to 146,682 in 2026
- 🗑 Projected average annual increase in Kingston’s population of 1% over the 25 year planning period (2006 – 2031)
- 🗑 Per capita residential waste generation rate of 402 kg/year
- 🗑 In the 2005 base year, City of Kingston residents generated 47,338 tonnes of solid waste.
- 🗑 The City achieved a 42% diversion rate in 2005
- 🗑 Total residential waste generated over the course of the planning period will be 1.6 M tonnes (assuming that the per capita waste generation rate remains constant over this 25 year timeframe).

### Facilities and Diversion Programs

- 🗑 Kingston Area Recycling Centre (KARC) –

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<sup>6</sup> COIL Strategy, Summary Report, City of Kingston, Revised March 2005

- houses the Material Recycling Facility (MRF),
  - the permanent Household Hazardous Waste (HHW) depot
  - the leaf & yard waste composting pad and brush site
  - central receiving area for public drop off of blue box material by residents and retail establishments.
- 🗑 The City also owns a small landfill located on Concession Road 4 in Kingston East which is at capacity and will likely be closed by the end of 2009.
  - 🗑 Waste Management Inc. transfers the waste collected by the City through its transfer station located at 62 St. Remy Place. Residents are able to access the transfer station for disposal of regular household garbage and large articles for a fee.
  - 🗑 IC&I and some multi-residential waste is collected and managed via private contracts.
  - 🗑 Residential garbage is collected weekly - 2 free bags, extra bags require bag tags @ \$2.00
  - 🗑 Commercial properties in the downtown BIA and multi-residential and condominium properties can opt in for service for a fee.
  - 🗑 2-stream recycling - Blue boxes for #1 screw top only, #2, #4, #5 and #6 plastics, glass, metal food and beverage cans, aluminium trays, foil and grey boxes for fibres (boxboard, corrugated cardboard, newspapers, recyclable paper, polycoat) and plastic bags. The Blue Box and Grey Box recycling streams are collected on alternating weeks.
  - 🗑 Leaf and yard waste collection in autumn.
  - 🗑 Large items may be brought to the landfill or transfer station for a fee.

### **Overview of Utilities Kingston Biosolids Management System**

- 🗑 The City of Kingston operates two water pollution control plants (WPCP) which generate biosolids. These biosolids are biologically stabilized through anaerobic digestion according to Provincial Guidelines so they can be disposed of by land application as an organic soil conditioner.
- 🗑 The Kingston West WPCP services a population of 44,000 (2003 numbers). The Ravensview WPCP serves approximately 70,000 people (2003 numbers). Historically, disposal options for biosolids have been primarily farmland application in cake or liquid form with some landfill and lagoon disposal.

**Table 2-1 Total Biosolids generation rates (both plants) 2001 – 2026**

		2001	2006	2011	2016	2021	2026
Estimated biosolids generated (tonnes D.S.)	Based on Current practices	2147	2396	2748	2873	2917	2965
	MOE – future process	2829	3146	3597	3761	3824	3891

-  The amount of biosolids generated is expected to increase by 80% in the 25 year planning period which can be attributed to an increase in population and a change from primary to secondary treatment processes at Ravensview.
-  The City of Kingston recently undertook a large biosolids management study with significant public consultation to develop a long term plan for managing Kingston’s biosolids in light of recent technical and scientific advances and changes in legislation. The recommendation of this study was to proceed with enhancements to the current Biosolids Processing Train with the continued land application of biosolids. See [http://www.cityofkingston.ca/pdf/environment/biosolids\\_finalreport.pdf](http://www.cityofkingston.ca/pdf/environment/biosolids_finalreport.pdf)

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## 2.5 Description of Existing Waste Generation and Composition

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### 2.5.1 Waste Composition and Generation Estimates

Our assessment has focused on the residential waste that is presently managed by the City of Kingston. The waste composition and generation data was provided by City of Kingston staff from the following sources:

-  The residential waste audit and report completed in July 2007 for the City by Jacques Whitford Staff.
-  The 2001 residential waste audit and report prepared for the City by J.L Richards Associates Ltd.
-  Residential waste generation projections, to 2031, based on data from the Waste Diversion Ontario (WDO) data call for the (2005) base year, a per capita waste generation rate for the City from the WDO data call, and annual population and household growth projections, to 2031, provided by City staff.

According to the 2005 WDO Datacall information, City of Kingston residents generated 47,384 tonnes of solid waste. The City achieved a 42.5% diversion rate as follows:

-  Diversion of 10,269 tonnes of Blue and Grey Box materials (21.7% of total managed).
-  Diversion of 9,752 tonnes of Leaf & Yard Waste (20.6% of total managed).
-  Diversion of 103 tonnes of HHW, Scrap Metal and Tires (.2% of total managed).

The balance, 27,260 tonnes, was landfilled, largely by contract with the private sector.

The amount of recyclables diverted includes those collected curbside as well as at the depots. The diversion of leaf & yard waste includes backyard composting, grasscycling, bulky/oversized items as well as material collected both curbside and at the depot. The balance of material to be disposed includes residual waste collected curbside and at the depot in addition to the residue left from recycling, leaf & yard waste and household hazardous waste.

Based on a population of 117,827 in 2005<sup>7</sup> and a total amount of 47,384 tonnes of waste generated, the waste generation rate is 402 kg per capita per year. With 49,263 households documented in 2005, the per household generation rate is 962 kg per household per year. The graph below shows the types of materials generated by residents in 2005 by weight.

Figure 2-2 Waste Generation – 2005 (by Weight)

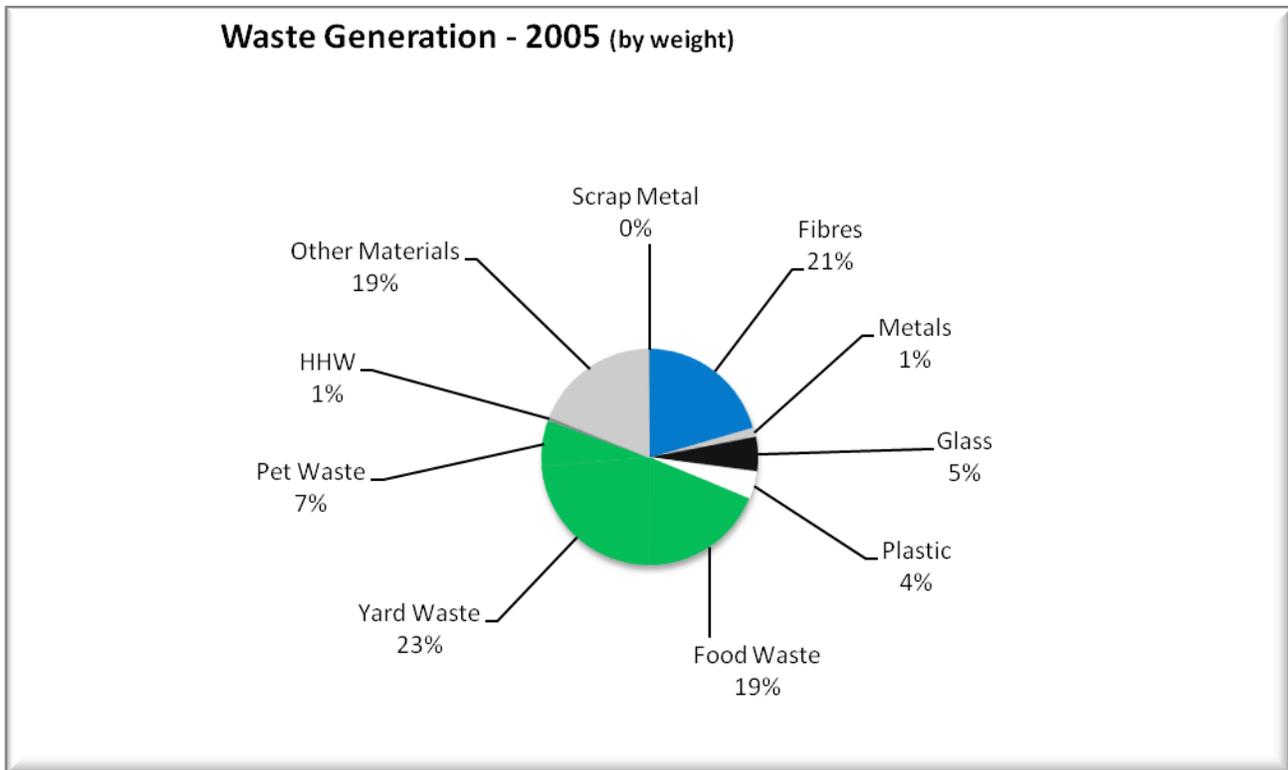


Figure 2-2 illustrates the breakdown of all materials generated by residents based on historical data from the 2005 WDO datacall. This includes material collected through curbside programs (blue & grey box, leaf & yard, residual waste) and depot programs (recycling, leaf & yard, scrap metal, tires, HHW, garbage). The category of other materials include items collected curbside and at the depots such as tires, residue from leaf & yard and HHW collection and processing, diapers & sanitary products, textiles, carpeting, construction & renovation debris, electronics, ceramics, small kitchen appliances and TV & audio equipment.

<sup>7</sup> WDO Datacall 2005 (single and multi-family)

2.5.2 2007 Residential Waste Audit

A single family waste audit was completed in July, 2007 by Jacques Whitford audit staff. Three sample neighbourhoods were chosen by City staff; 10 households each in an urban, suburban and rural neighbourhood. Curbside waste was collected over a one-week period by City staff, and sorted and weighed by the audit crew. The urban and rural neighbourhoods averaged 1.6 bags per household while the suburban neighbourhood averaged 1.5 bags per household.

Approximately 14% of the material found in the residual waste could have been diverted through the existing recycling programs. The remaining 86% of residual waste consisted of other materials that are not accepted in current recycling programs, compostable material, household hazardous waste and other materials such as textiles, construction & renovation debris, TV & audio equipment, small kitchen appliances, ceramics, and other electronics.

Figure 2-3 Composition of Residual Waste by Major Material Type

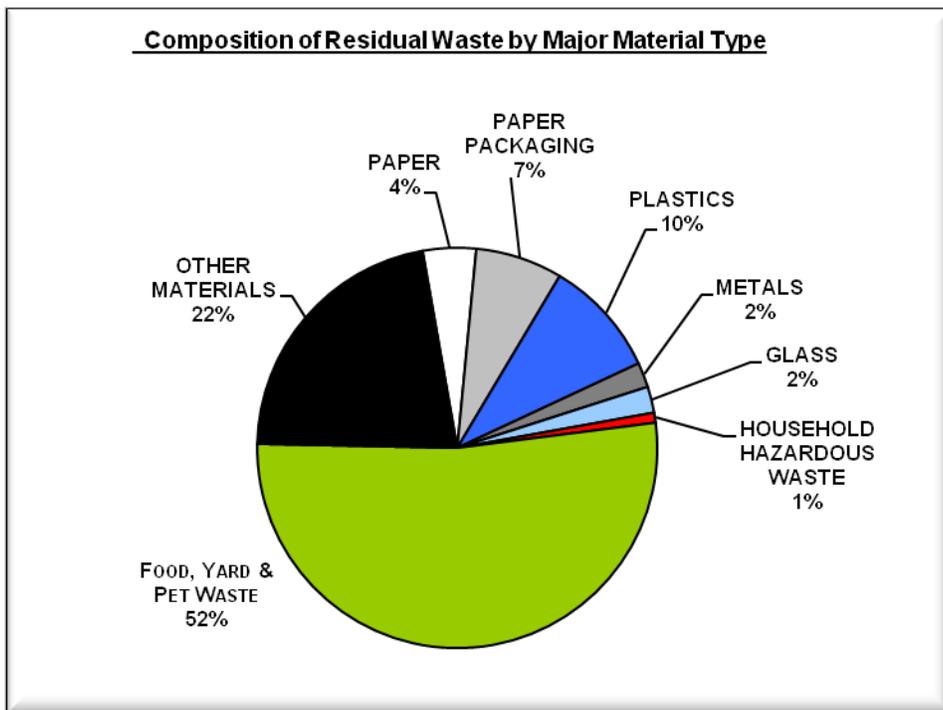


Figure 2-3 illustrates a breakdown of the major material types found during the 2007 audits of residual waste. It should be noted that this figure merely illustrates the composition of residual waste according to this particular point in time; it does not illustrate what content is recyclable or potentially divertable. For instance, the plastics category includes large HDPE & PP pails and lids, rigid plastic packaging and other durable plastic items i.e., toys, none of which are accepted in the current recycling program. Even some items that are accepted in the current recycling programs may not be recyclable due to breakage or contamination and would be considered as “residue” which ultimately is landfilled.

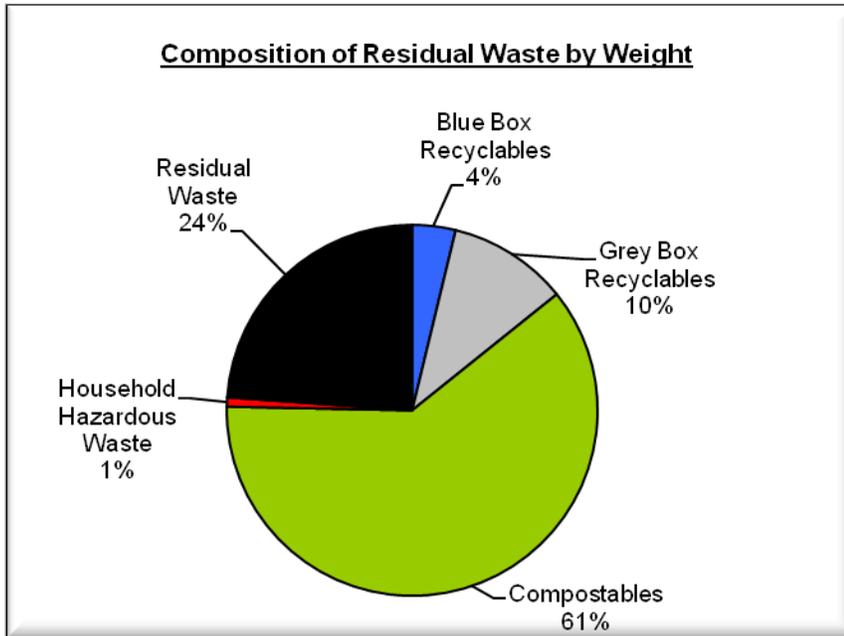
**Figure 2-4 Composition of Residual Waste by Weight**

Figure 2-4 illustrates the results of the 2007 residual waste audit showing a general composition of the material found in the residual waste. 14% of the material in the residual waste is currently recyclable through existing recycling programs, 61% consists of potentially compostable material such as kitchen, leaf & yard and pet waste as well as diapers & sanitary waste and tissues/towelling. The remaining 24% of residual waste refers to material not currently accepted in recycling programs or other diversion programs.

Should the City decide to pursue the diversion of compostable material, more detailed projections of amounts of these types of materials would need to be developed in order to accurately calculate the amounts of compostable material potentially available. The results of this audit are based on a very small sample size which may not accurately depict the true quantity of materials.

### 2.5.3 Comparison of Audit Results

In 2001, an audit of Kingston's waste was conducted by J.L. Richards Associates Ltd. This audit sampled both recyclables and residual waste. The audit conducted by Jacques Whitford only sampled the residual waste stream. As a result, only the audit results for the garbage portion of the waste stream can be compared. Overall, from 2001 to 2007, the audit shows very little variation in numbers. Both audits sampled approximately the same number of houses, however, the 2001 audit sampled the same houses over a three week period while the 2007 audit sampled houses in urban, suburban and rural neighbourhoods over a one-week period. The average number of garbage bags per household in 2001 was 1.8 per week while in 2007 it ranged from 1.5 to 1.6 bags per household per week.

When comparing the 2007 and 2001 audits, there was a decrease of 1% in the amount of compostable material and an increase of 1% in the amount of recyclables in the garbage. Additional education about what materials are recyclable may aid in increasing diversion of recyclable material from the waste stream.

There have not been any significant changes to Kingston's diversion programs between audits that would account for the difference in the amount of recyclables in the waste stream. In October 2006, the City of Kingston switched to a recycling system that entails using two recycling containers – a grey box for fibres and a blue box for containers and plastic bags. This represents the only fundamental change to the recycling program; Kingston has had an extensive recycling program for a number of years.

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#### 2.5.4 IC&I Waste

The primary focus of the IWM study is the residential waste stream managed by the City. However, the industrial, commercial and institutional sector (IC&I sector) of the City generates significant quantities of waste that are managed by private sector service providers. In most municipalities, the residential waste stream comprises less than half of the total waste generated in the community with the IC&I sector generating more than half of the waste. Data on the quantity of waste diverted and disposed by the IC&I sector were not available for review as part of Phase A of this study. As part of later phases, the private sector waste service providers will be contacted in order to gain a better understanding of how IC&I wastes are currently being managed. The IC&I sector and their private sector service providers should be involved in some discussion on how best to address goals and objectives for IC&I waste in the City's IWM strategy.

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### 3.0 STEP 2 RESULTS – FUTURE WASTE MANAGEMENT SYSTEM GOALS & OBJECTIVES

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#### 3.1 Integrated Waste Management Hierarchy

Integrated waste management plans that address all aspects of the waste management system (collection, processing, diversion, and disposal) are recognized as a municipal Best Practice here in Ontario and in other jurisdictions. Prior to 2007, Integrated Waste Management Planning was identified as a best practice through the Ontario Municipal Benchmarking Initiative and Waste Diversion Ontario. In June 2007, the Ontario Ministry of the Environment released a *Policy Statement on Waste Management Planning: Best Practices for Waste Managers* and identified integrated waste management system planning as one of the fundamental principles that should be used to make waste management decisions.

Generally, the approach used for system planning should be based on the following principles:

1. Development and evaluation of policies and programs considering the 'triple bottom line' (financial, social, environmental) to ensure a sustainable waste management system; and
2. A hierarchy of waste management practices.

In many jurisdictions, adoption of a waste management hierarchy has been the key element that has driven waste management policy. The hierarchy included in the European Union's Waste Framework Directive has been widely applied in the development of waste management policy in member states. The hierarchy implies that various waste materials depending on their characteristics should be handled by prevention or avoidance where possible, through diversion initiatives and through recovery of resources such as energy, with landfill disposal reserved for those materials that cannot be managed

through any other means. The hierarchy assumed by most EU member states, supported by the Association of Municipalities of Ontario (AMO) and reflected in the waste value chain set out in Ontario's Policy Statement, generally sets out the priorities for waste management as follows:

1. Prevention / Avoidance (reduce overall waste generation through behavioural or technological change)
2. Enhanced Design for Reduction or Reuse
3. Product Reuse
4. Material Recycling, Composting and Anaerobic Digestion
5. Resource Recovery (recovery of fuels and/or materials for secondary use)
6. Thermal Treatment with Energy Recovery
7. Landfill with Energy Recovery
8. Landfill or Thermal Treatment without Energy Recovery.

Integrated waste management plans that are based on such a hierarchy generally are more successful in:

- Diverting waste from landfill;
- Controlling or reducing overall system costs;
- Creating new economic opportunities; and
- Preserving the natural environment through reduced consumption of natural resources, reduced emissions to air and water and reduced GHG emissions.

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### 3.2 Approved Waste Management System Goals & Objectives for Kingston

The draft waste management system goals and objectives developed for the City of Kingston as set out below, are based on the adoption of a 'triple bottom line'/sustainable approach and a waste management hierarchy aligned with that adopted by other progressive jurisdictions.

Vision: An integrated waste management system that is appropriate to the local environmental, social and economic conditions.

#### **Environmental Goals:**

- 1) The production of residential and IC&I waste should be minimized by pursuit of the following objectives:
  - a) As an interim objective, stabilizing the waste generation rate (kg/capita generated including Residual Waste, Recyclables and Organics) for both the Residential and IC&I sectors.
  - b) As a longer term objective, an annual decline in the overall waste generation rate.
- 2) Materials in the overall waste stream should be managed in a manner that maximizes environmental sustainability by pursuit of the following objectives:

- a) Consideration of the best results for the protection of the environment in the design of waste management programs, processes and facilities.
- b) Achievement of a residential waste diversion rate of 65% by 2012.
- c) Working in partnership with the IC&I community to: explore voluntary options for waste reduction; lobby the provincial and federal governments on waste issues; and consider the need for new municipal legislation on waste diversion.
- d) Minimization of the total amount of residual waste materials with any resource value lost to disposal.
- e) Consideration of systems and technologies that, at a minimum, limit pollutants generated in the handling of Kingston's waste to levels allowed by applicable laws and regulations.
- f) Consideration of systems and technologies that reduce overall GHG emissions in accordance with City's obligations required as part of the Partners in Climate Protection Program.
- g) Management of all designated household hazardous waste materials through appropriate programs;
- h) Consideration of the sources of waste and responsibilities of both the provincial and federal governments in regulating waste materials.

### **Socio-Economic Goals**

- 3) A system of programs, processes and facilities that is integrated in recognition of:
  - a) Differences in sources of waste and service level requirements within the community.
  - b) Opportunities and constraints that may exist between the waste management system and other municipal systems, institutions and business (e.g. drainage, land inventory, energy supply / demand, etc.)
- 4) A system of programs, processes and facilities that is sustainable in recognition of:
  - a) The local environmental, social, and economic conditions.
  - b) The overall impact of construction, operations and maintenance; and
  - c) The ability of the community to pay for services.
- 5) A system of programs, processes and facilities that is sustainable in recognition of the capability of the system to be maintained over time without exhausting the financial resources it needs and without importing waste resources from other municipalities in a manner that would negatively impact Kingston's environment.
- 6) Implementation of a system that rewards individual waste reduction and recycling efforts.
- 7) A system that limits costs to the taxpayer in accordance with the environmental and socio-economic goals stated above and through the full evaluation of:
  - a) Potential sources of revenue;
  - b) Overall capital investment and operations and maintenance costs; and
  - c) The value of social, economic and environmental benefits that will be accrued over the life of the system.

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## 4.0 STEP 3 RESULTS – NEEDS/GAP ANALYSIS

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### 4.1 Projected Waste Generation & Composition

Based on a projected average annual increase in Kingston's population of 1% over the 25 year planning period (2006 – 2031) and a per capita residential waste generation rate of 402 kg/year, the total residential waste generated over the course of the planning period is estimated to be 1.6 M tonnes (assuming that the per capita waste generation rate remains constant over this 25 year timeframe). *Note: this projection is conservative since recent studies in other jurisdictions have revealed that per capita waste generation rates continue to increase.* On the basis of this data, the amount of waste generated per annum could increase from 47,699 tonnes in 2006 to 61,636 tonnes in 2031.

As stated previously, the City achieved a 42% diversion rate in 2005. The City may be able achieve a 50% diversion rate by 2010, through the expansion of the Blue and Grey Box recycling programs, an increase in participation rates, a ban on recyclables in garbage, targeting the student population with an aggressive education and promotion program, etc., the total quantity of "post-diversion" residual waste requiring management could average 55,730 tonnes per annum for a total amount generated over the course of the planning period of 1.17M tonnes. The ability of the City to achieve 50% diversion of residential waste through the above noted programs would have to be confirmed in Phase B of the IWM study, through detailed analysis of the waste stream and potential capture rates by material type.

Based on the 2001 waste audit, 36% of the residential waste was composed of kitchen and leaf & yard wastes. The 2007 audit indicated that 40% of the waste stream was composed of leaf & yard waste (all types) and kitchen waste. Assuming that there is no significant change in the composition of the City's residential waste over the course of the 25-year planning period, the quantity of leaf & yard and kitchen organics requiring management could increase from 17,172 tonnes in 2006 to 22,189 tonnes in 2031. Note: in addition to leaf & yard and kitchen organics, pet wastes and diapers/sanitary products can also be considered as compostable components of the waste stream, along with non-recyclable paper fibres.

These are very gross projections based on limited data. This data should be updated and the projections refined as part of the background assessments undertaken in the development of the City's integrated waste management program.

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#### 4.1.1 Preliminary Diversion Scenarios

Some preliminary diversion scenarios have been developed as examples of what level of diversion could be achieved over the planning period and in order to estimate the potential range for the cumulative total of waste requiring disposal. These are as follows:

-  Status quo – 42.5% diversion based on 2005 data
-  45% diversion in 2008. This scenario may be achieved with additional public education and public participation.

- ♻️ 60% diversion in 2010. This scenario assumes the implementation of a source separated organics program by 2010 with moderate to high participation rates encouraged by bi-weekly waste collection and a two-container limit.
- ♻️ 65% diversion in 2012. This scenario assumes implementation and operation of a source separated organics program in 2010 and a high participation rate encouraged by bi-weekly waste collection and a one-container limit.
- ♻️ 70% diversion in 2012. This scenario assumes implementation and operation of an expanded source separated organics program in 2010 (including kitchen organics, pet wastes and diapers/sanitary products) with maximum participation by residents.

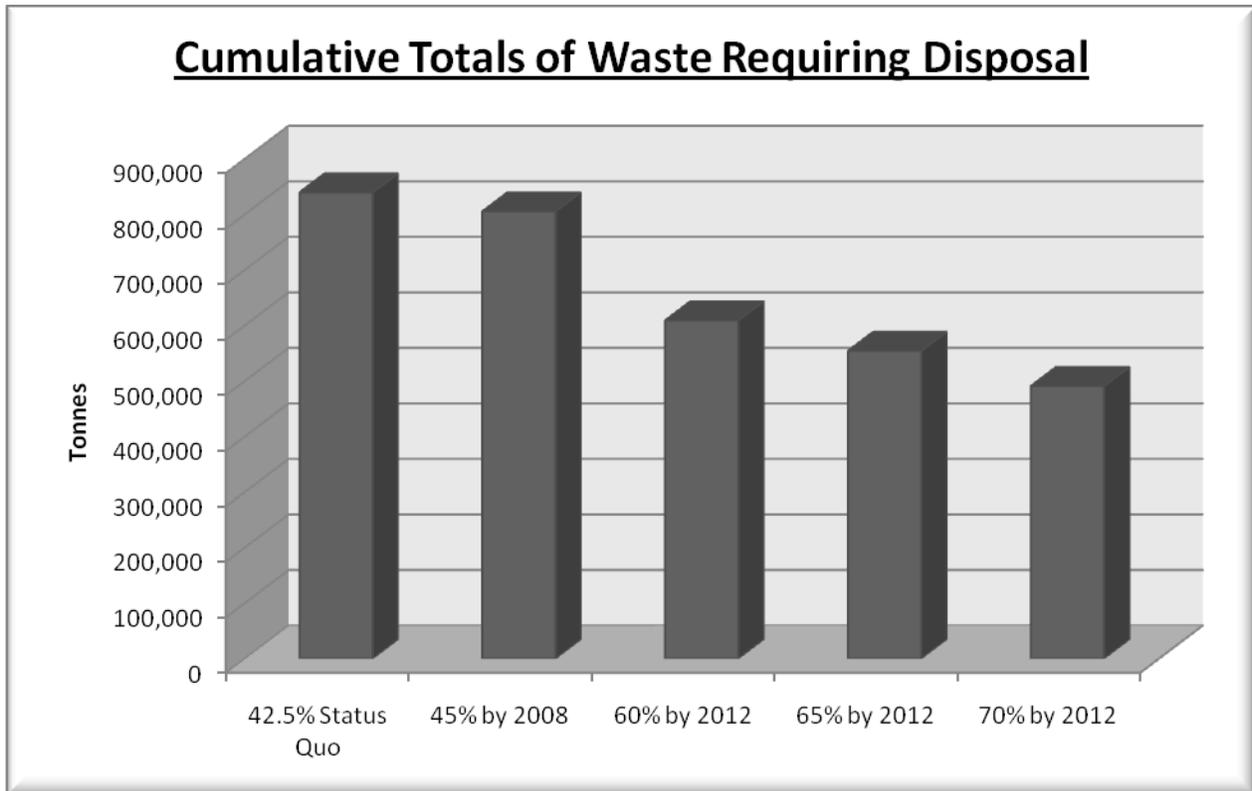
During Phase B of the IWM study, detailed diversion rate estimates will be developed for each of the Waste Management System options that are evaluated, considering the potential material types and realistic capture rates that would be associated with each system. These diversion rate estimates would have to address the design of the system, degree of enforcement of diversion programs and realistic scenarios for encouragement and enforcement of higher diversion targets.

**Figure 4-1 Matrix of System Options**

	<b>Potential System Options</b>				
<b>Diversion Scenario</b>	<b>Education</b>	<b>Reduce</b>	<b>Recycle</b>	<b>Leaf and Yard</b>	<b>Organics</b>
<b>45% from 2005 – 2008</b>	Public education	Container limit to 2 per week	Increased through public education		
<b>60% by 2010</b>	Aggressive public education	2 Container limit collected biweekly.	Increased through public education	Brown and green waste Expand # of weeks	SSO – kitchen organics
<b>65% by 2012</b>	Aggressive public education	1 Container limit collected biweekly. Material Bans	Increased through public education	Brown and green waste Expand # of weeks	SSO – kitchen organics
<b>70% by 2012</b>	Aggressive public education	1 Container limit collected biweekly. Material Bans, Increased Enforcement	Increased through public education	Brown and green waste Expand # of weeks	SSO – kitchen organics, pet wastes, +sanitary products, diapers etc. with aggressive program timeline

The following graph illustrates the potential impact of these preliminary diversion scenarios on the total (cumulative) amount of residual waste requiring management over the planning period. Over the planning period, the total cumulative amount of residual waste that would remain for disposal could range between 450,000 and 900,000 tonnes.

**Figure 4-2 Cumulative Total of Residual Waste**



The above noted diversion scenarios do not include diversion estimates associated with mixed waste processing of either the remaining residual waste stream, or mixed waste processing undertaken in lieu of source separated diversion programs. While generally the waste hierarchy encourages source separated diversion, optimal system design should be based on the unique needs of the community.

As Kingston has a relatively high transient population associated with post-secondary institutions etc., mixed waste processing may be an appropriate system option to achieve comparable diversion results. Mixed waste processing can also further reduce the residual stream of waste that requires landfill disposal by for example capturing metals that cannot be recovered by conventional blue box recycling and waste derived fuels that could be used in industrial or energy-from-waste applications.

The potential role of additional Resource Recovery (recovery of fuels and/or materials for secondary use) and/or Energy-from-Waste will be examined in Phase B.

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## 4.2 Identification of Short & Long-Term Needs

Discussions with City Representatives indicate that both short and long-term needs should be addressed in the IWM study, and that the IWM strategy should reflect a phased implementation approach over the 25-year planning period.

In the short-term (2008 to 2012), the City has expressed interest in achieving higher diversion rates in the short-term, while developing the necessary system and long-term infrastructure to achieve the longer term goals and objectives. It is recognized that development of the appropriate infrastructure to support the longer term IWM system will take some time (2 to 4 years).

The short-term needs for increased diversion could be met through implementing an interim green-cart program for organics diversion in urban areas and/or through increased promotion and enforcement of existing diversion programs. Any new diversion initiatives proposed for the short-term need to fit appropriately into the broader context of the longer term IWM system to ensure wise use of the City's resources.

4.3 Gap Analysis

Goal / Objective	Assessment of Existing System Capacity	Potential System Improvements to Achieve Goals
<b>1) The production of residential and IC&amp;I waste should be minimized by pursuit of the following objectives:</b>		
<p>a) As an interim objective, a stabilized waste generation rate (including Waste, Recycling and Organics) for both Residential and IC&amp;I sectors.</p>	<ul style="list-style-type: none"> <li>Existing system provides limited incentive or capability for residents to reduce the quantity of materials they generate for management by the City's waste management programs.</li> </ul>	<ul style="list-style-type: none"> <li>Container limits and PAYT can reduce overall waste generation of residential materials</li> <li>Leadership options such as formal recognition of IC&amp;I stakeholders that can demonstrate stabilized or reduced generation rates could encourage stabilization of the waste generation rate for this sector</li> </ul>
<p>b) As a longer term objective, an annual decline in the overall waste generation rate.</p>	<ul style="list-style-type: none"> <li>Expanded promotional and educational programs may provide the self-initiated an understanding of why it is important to divert from disposal.</li> </ul>	<ul style="list-style-type: none"> <li>Social mores may encourage reduction in waste generation.</li> <li>Mandatory diversion options, progressively stronger container limits and PAYT as well as enforcement should also encourage reduction in waste generation.</li> </ul>
<b>2) Materials in the overall waste stream should be managed in a manner that maximizes environmental sustainability by pursuit of the following objectives:</b>		
<p>a. Consideration of best resource value of waste materials in the design of waste management programs, processes and facilities.</p>	<ul style="list-style-type: none"> <li>Existing system considers best resource value of some recyclable materials.</li> </ul>	<ul style="list-style-type: none"> <li>Options such as resource recovery (including mixed waste processing) and energy-from-waste would allow for consideration of best resource value for materials that are currently landfilled.</li> <li>Consideration of resource recovery options and the role of SSO would consider best resource value in the context of Kingston's long-term waste management needs.</li> </ul>
<p>b. Achievement of a residential waste diversion rate of 65% by 2012.</p>	<ul style="list-style-type: none"> <li>Without additional diversion programs, 65% diversion will not be achieved by 2012.</li> </ul>	<ul style="list-style-type: none"> <li>Options such as source-separated organics, increased promotion for the blue box program, increase in cost of bag tags, reduction in number of allowed bags may assist in increasing diversion rates.</li> <li>Review, consolidation and enforcement of waste management by-laws.</li> </ul>

Goal / Objective	Assessment of Existing System Capacity	Potential System Improvements to Achieve Goals
<p>c. Working in partnership with the IC&amp;I community to: explore voluntary options for waste reduction; lobby the provincial and federal governments on waste issues; and consider the need for new municipal legislation on waste diversion.</p>	<ul style="list-style-type: none"> <li>• Official plan for amalgamated municipalities is being reviewed. Solid Waste by-laws do not fall within intent and scope of new Official Plan/Zoning By-law.</li> <li>• Diminished lobbying capacity as a single municipality,</li> </ul>	<ul style="list-style-type: none"> <li>• Continue to work with AMO, AMRC, FCM and other municipal organizations in lobbying for initiatives intended to encourage IC&amp;I Diversion.</li> <li>• Design requirements and mandated recycling facilities in new developments.</li> <li>• Consider inclusion of IC&amp;I sector in waste by-laws.</li> <li>• Mandatory recycling to receive garbage collection.</li> </ul>
<p>d. Minimization of the total amount of waste disposed by landfill.</p>	<ul style="list-style-type: none"> <li>• Existing system provides little opportunity to minimize waste disposed by landfill.</li> </ul>	<ul style="list-style-type: none"> <li>• Additional diversion programs such as source separated organics will assist in minimizing the total amount of waste disposed by landfill.</li> <li>• Increase tipping fees at landfill.</li> <li>• resource recovery (including mixed waste processing) and/or energy-from-waste</li> </ul>
<p>e. Consideration of systems and technologies that reduce overall GHG emissions in accordance with City's GHG reduction policy.</p>	<ul style="list-style-type: none"> <li>• Reduced GHG emissions associated with existing recycling programs.</li> <li>• Existing system provides little opportunity to reduce GHG emissions associated with collection and disposal.</li> </ul>	<ul style="list-style-type: none"> <li>• Expansion of recycling programs and recovery of more materials for secondary use will reduce GHG emissions.</li> <li>• Reduced dependence on landfill and in particular SSO diversion should reduce direct GHG emissions (methane) from landfill.</li> <li>• Co-collection of materials (e.g. collection of garbage and organics in separate compartments of the same vehicle) will improve collection efficiency and assist with reduction of GHG emissions.</li> <li>• Recovery of energy from biomass portion of the waste stream (organics and paper) will reduce GHG emissions by substituting for energy from fossil fuel sources.</li> </ul>
<p>f. Management of all designated household hazardous waste materials through appropriate programs;</p>	<ul style="list-style-type: none"> <li>• Existing hazardous waste program limits residents' ability to dispose of these materials due to limited hours and closure of the facility from November to April.</li> </ul>	<ul style="list-style-type: none"> <li>• Extended hours for HHW drop-off may encourage proper disposal reducing potential negative environmental impacts at processing and/or disposal facilities.</li> </ul>
<p>g. Consideration of the sources of waste and responsibilities of</p>	<ul style="list-style-type: none"> <li>• Limited options to influence the province and federal governments as</li> </ul>	<ul style="list-style-type: none"> <li>• Continue to work with AMO, AMRC, FCM and other municipal organizations in lobbying initiatives intended</li> </ul>

Goal / Objective	Assessment of Existing System Capacity	Potential System Improvements to Achieve Goals
both the provincial and federal governments in regulating waste materials.	an individual municipality	to encourage both levels of government to address the need for increased regulation of waste materials.
<b>3) A system of programs, processes and facilities that is integrated in recognition of:</b>		
a) Differences in sources of waste and service level requirements within the community.	<ul style="list-style-type: none"> <li>Limited capability of existing system to accommodate variations in amounts and composition of waste and unique service level issues for various sectors i.e., multi-residential buildings, student housing, senior housing.</li> </ul>	<ul style="list-style-type: none"> <li>Modify or alter collection schedule, programs and procedures to capture more material from more transient, mobile population. Mixed waste collection and processing is an option that would increase the diversion potential for transient populations and multi-residential buildings.</li> <li>Consider alternative collection options for institutions generating significant amounts of waste.</li> <li>Alter set-out requirements or containers for elderly or handicapped residents or include specialized level of service (at-door) collection for registered locations.</li> </ul>
b) Opportunities and constraints that may exist between the waste management system and other municipal systems, institutions and business (e.g. drainage, land inventory, energy supply/demand)	<ul style="list-style-type: none"> <li>Most communities do not use an integrated planning approach to address opportunities and constraints across service areas.</li> </ul>	<ul style="list-style-type: none"> <li>Consult with other Municipal departments and institutions during the IWM Study.</li> </ul>
<b>4) A system of programs, processes and facilities that is sustainable in recognition of:</b>		
a) The local environmental, social, and economic conditions.	<ul style="list-style-type: none"> <li>Current waste management system partially recognizes local environmental, social and economic conditions.</li> </ul>	<ul style="list-style-type: none"> <li>Evaluation of IWM options should:                             <ol style="list-style-type: none"> <li>address direct and indirect environmental benefits of increased diversion (for example decreases in air emissions);</li> <li>address social issues such as potential for local employment, impacts of programs on disadvantaged residents, seniors etc.</li> <li>address the direct and indirect economic</li> </ol> </li> </ul>

Goal / Objective	Assessment of Existing System Capacity	Potential System Improvements to Achieve Goals
		impacts of the system options such as potential increases/decreases in property taxes, other cost recovery mechanisms, increased investment in the community.
b) The overall impact of construction, operations and maintenance; and	<ul style="list-style-type: none"> <li>• Some of the current infrastructure is Municipally owned (i.e. the MRF), offering greater flexibility to recover additional materials and/or grades of materials and control of residue levels.</li> <li>• Transfer and Disposal infrastructure is privately owned for the most part.</li> </ul>	<ul style="list-style-type: none"> <li>• Assess implementation options for infrastructure development for the long-term, addressing the advantages and disadvantages of municipal and private sector roles in financing, ownership, operation and maintenance of facilities.</li> </ul>
c) The ability of the community to pay for services.	<ul style="list-style-type: none"> <li>• Existing system sustainable through current taxpayer revenue without specific increases.</li> <li>• Kingston does marketing of material which allows it to keep more revenue.</li> </ul>	<ul style="list-style-type: none"> <li>• Funding or grants to offset improvements to system.</li> <li>• Contract marketing of material to take advantage of large volume pricing.</li> </ul>
5) A system of programs, processes and facilities that is sustainable in recognition of the capability of the system to be maintained over time without exhausting the resources it needs.		
	<ul style="list-style-type: none"> <li>• In regards to financial resources, existing system sustainable through current taxpayer revenue without specific increases.</li> <li>• In regards to input materials, current system is very flexible as more or less material could be sent to landfill and MRF can accommodate some increase in recovery of recyclables</li> </ul>	<ul style="list-style-type: none"> <li>• Implementation plan for the IWM system should address financial resource requirements and financing/cost recovery including facility/equipment replacement costs over the long-term.</li> <li>• Evaluation of IWM system options should address the flexibility of the system to accommodate increases or decreases in waste quantities and changes in waste composition.</li> </ul>
6) <b>Implementation of a system that rewards individual waste reduction and recycling efforts.</b>		
	<ul style="list-style-type: none"> <li>• All residents treated anonymously in existing system.</li> <li>• Waste system costs are currently</li> </ul>	<ul style="list-style-type: none"> <li>• Consideration of a full user pay or utility based system so that system costs are based on usage not property value.</li> </ul>

Goal / Objective	Assessment of Existing System Capacity	Potential System Improvements to Achieve Goals
	funded through the rate based tax system	<ul style="list-style-type: none"> <li>• Cash incentives, public recognition for use of diversion programs and/or waste reduction by residents and/or IC&amp;I sector.</li> <li>• Reward dollars used at local retailers which could be beneficial for residents and retailers.</li> </ul>
<b>7) A system that minimizes costs to the taxpayer through the full evaluation of:</b>		
a) Potential sources of revenue;	<ul style="list-style-type: none"> <li>• Revenue generated through sales of recyclable material only.</li> </ul>	<ul style="list-style-type: none"> <li>• Revenue could be realized through sales of compost, energy or other recovered materials.</li> <li>• Revenue could be realized through GHG emission credits.</li> </ul>
b) Overall capital investment and operations and maintenance costs; and	<ul style="list-style-type: none"> <li>• Improvements to existing infrastructure would need to be made to maintain current system with increased diversion through improved participation.</li> </ul>	<ul style="list-style-type: none"> <li>• Consider advantages/disadvantages of financing options in the short and long term as part of implementation plan.</li> </ul>
c) The value of social, economic and environmental benefits that will be accrued over the life of the system.	<ul style="list-style-type: none"> <li>• Are recognized social, economic and environmental benefits of the current system.</li> </ul>	<ul style="list-style-type: none"> <li>• Consider potential social, economic and environmental benefits over the life of the system options during evaluation and selection of the preferred system. For example, evaluation should address potential direct and indirect employment opportunities, Life Cycle Analysis of energy recovery/consumption, GHG emissions and other emissions to Air and Water.</li> </ul>

## 5.0 PHASE A PUBLIC CONSULTATION

The draft Phase A Report was presented to the EITP Committee and endorsed in principle the evening of December 13, 2007. At that meeting the Committee directed that the draft Phase A Report be released for public review and comment and that a final Phase A Report incorporating public feedback be brought back to the EITP Committee for consideration. Accordingly, the draft report was made available on the City’s website and a public consultation session hosted by the EITP Committee at the Portsmouth Olympic Harbour was held on January 30, 2008. At the session, the project consultant presented the results of Phase A and subsequently questions from the public were answered by City staff and the consultant team.

Table 5-1 contains a summarized account of the 71 comments received at the public consultation session, by email and by way of the City website. Responses to these comments are also provided considering the work that has been completed to date in Phase A and the work program for subsequent phases of the study.

**Table 5-1 Public Comment & Response Summary – Phase A of the Kingston Integrated Waste Management Study**

Comments Received from Public	Response at Phase A of Study
<ul style="list-style-type: none"> <li>Suggestion that a clear bag collection system be used to help prevent recyclable materials in the garbage bag.</li> </ul>	<ul style="list-style-type: none"> <li>The use of deterrents or incentives like a clear bag system will be considered as potential elements of alternative systems at Phases B &amp; C of the study and will be further considered, in more detail if applicable, as part of the implementation strategy at Phase D.</li> </ul>
<ul style="list-style-type: none"> <li>Will the study be considering approaches to get people involved in using whatever system is implemented by the City?</li> </ul>	<ul style="list-style-type: none"> <li>Communications and public education to encourage optimal use of the long-term system selected by Kingston will be a key component of the implementation strategy developed at Phase D of the study.</li> </ul>
<ul style="list-style-type: none"> <li>The City’s waste management system needs to recognize differences between various neighborhoods in the City (e.g. areas dominated by student residences versus single family residential)</li> </ul>	<ul style="list-style-type: none"> <li>The flexibility of alternative waste management approaches, systems and technologies to accommodate differences or changes in waste generation, characteristics, or handling at source will be included in the evaluation criteria to be applied at Phases B and C of the study.</li> </ul>
<ul style="list-style-type: none"> <li>The City’s waste management system needs to provide an equal level of service across all areas of the City and should not discriminate against those that may be challenged by use of common or mainstream collection systems.</li> </ul>	<ul style="list-style-type: none"> <li>The ability of alternative waste management approaches, systems and technologies to accommodate and provide an equitable level of service to all customers serviced by the City’s long-term waste management system will be included in the evaluation criteria to be applied at Phases B and C of the study.</li> </ul>

Comments Received from Public	Response at Phase A of Study
<ul style="list-style-type: none"> <li>Will the study be looking at examples of what is being done in other jurisdictions and the applicability of best practices to Kingston?</li> </ul>	<ul style="list-style-type: none"> <li>During Phase A of the study examples of waste management systems abroad were examined with regard to best practices and performance to establish recommended goals and objectives for the City of Kingston’s long-term waste management system.</li> <li>Similarly, examples of specific systems, approaches and technologies from abroad will be considered during the evaluation of alternatives at Phases B and C of the study.</li> </ul>
<ul style="list-style-type: none"> <li>How will wastes being generated by the private sector be addressed by the study?</li> </ul>	<ul style="list-style-type: none"> <li>The focus of the study at this point in time is on the materials that are collected and managed by the City of Kingston. These include wastes generated by residents, municipal facilities, and some businesses that receive curbside collection. It is the opinion of the City that they focus on getting their areas of responsibility in order before looking elsewhere. Notwithstanding, the City is aware that more than half of the wastes generated in Kingston are from the private sector and are currently being managed privately by way of contract. These materials could be considered for accommodation by the City’s future waste management system recognizing that the feasibility of doing so would be dependent on competition with current contractors and achievement of the City’s integrated waste management system goals and objectives.</li> </ul>
<ul style="list-style-type: none"> <li>The system to be implemented must ensure that the needs of the user are addressed and that the system’s use is considered easy by the resident / customer.</li> </ul>	<ul style="list-style-type: none"> <li>The aptitude of alternative waste management approaches, systems and technologies to be understood and easily used by residents / customers will be included in the evaluation criteria to be applied at Phases B and C of the study.</li> </ul>
<ul style="list-style-type: none"> <li>Residents need to be educated on purchasing practices that are required to support or drive a reduction in waste generation (e.g. choose products with less packaging, that are more durable, or that are more recyclable).</li> </ul>	<ul style="list-style-type: none"> <li>Communications and public education to encourage optimal use of the long-term system selected by Kingston , including front of system choices made by individuals, will be a key component of the implementation strategy developed at Phase D of the study.</li> </ul>
<ul style="list-style-type: none"> <li>How will the study address over packaging which is forced upon the consumer whom then must deal with the waste?</li> </ul>	<ul style="list-style-type: none"> <li>Recognizing that individuals / consumers likely have more influence over the use of packaging than municipalities, the study will consider the flexibility of alternative approaches, systems and</li> </ul>

Comments Received from Public	Response at Phase A of Study
	<p>technologies to manage changes or reductions in packaging over the long-term study period. It is anticipated that any significant changes in packaging will occur outside of the City's influence at a provincial, federal, or international level which dictates the need for the City's system to be flexible.</p>
<ul style="list-style-type: none"> <li>The education component of the system is paramount and needs to start with our children.</li> </ul>	<ul style="list-style-type: none"> <li>No matter what approach, system or technology is selected by the City, education will be a critical component of success and will be addressed at Phase D of the study as part of the integrated waste management system implementation.</li> </ul>
<ul style="list-style-type: none"> <li>Why can't people take or exchange items of others at the curb free of charge once a month?</li> </ul>	<ul style="list-style-type: none"> <li>As is evident in the waste management hierarchy presented in Section 3.1 of the report, reuse activities such as that being suggested in the comment will play an important role in the City's future waste management system and in achievement of targeted waste diversion achievements. Specific waste reduction programs, facilities and activities will be addressed during Phase D of the study when an implementation strategy is prepared.</li> </ul>
<ul style="list-style-type: none"> <li>Why does the Phase A report show statistics on the City's recycling performance based solely on samples from low density residential neighborhoods?</li> </ul>	<ul style="list-style-type: none"> <li>The audits completed in recent years by the City of Kingston have focused on those areas serviced by the Blue Box collection program which are predominated by low density residential neighbourhoods. As the study proceeds, waste characterization will draw upon an extensive base of data that has been developed by WDO and Stewardship Ontario for communities and neighbourhoods throughout Ontario. Where relevant data cannot be found in the existing data base, the need for additional audit work within Kingston will be contemplated and undertaken if necessary.</li> </ul>
<ul style="list-style-type: none"> <li>Will the study address the generation of garbage at schools?</li> </ul>	<ul style="list-style-type: none"> <li>Typically, wastes generated by schools is managed under a private contract. However, given the recognized importance of education and communications in the success of any waste management program and the relatively captive nature of children attending class, opportunities to educate and engage children in the school setting will be pursued over the course of the study.</li> </ul>

Comments Received from Public	Response at Phase A of Study
<ul style="list-style-type: none"> <li>Will the study look at the use of anaerobic digestion like that being done in Toronto?</li> </ul>	<ul style="list-style-type: none"> <li>Phase C of the study will look at specific types of technologies like anaerobic digestion for implementation of the preferred long term approach to managing Kingston’s wastes identified at Phase B.</li> </ul>
<ul style="list-style-type: none"> <li>How did the study arrive at a suggested diversion goal of 65%?</li> </ul>	<ul style="list-style-type: none"> <li>The 65 percent goal was established considering best practices and markets currently available for recyclables and organics generated by the City’s current area of responsibility and assuming near maximum participation and capture rates for the respective diversion programs. An integral part of the long-term system implementation will be annual monitoring, adjustments, and continuous improvement based on available technologies and markets at the time of review. Development of this monitoring program will be addressed at Phase D of the study.</li> </ul>
<ul style="list-style-type: none"> <li>How will the collection of household organics be implemented in Kingston?</li> </ul>	<ul style="list-style-type: none"> <li>The City of Kingston is currently in the process of rolling out a program for the collection of household organics from Kingston residences. The processing of organics collected from this program will be managed by contract initially for the first five years. Over the course of the five year period this integrated waste management study will be completed and the longer term approach for managing household organics determined.</li> </ul>
<ul style="list-style-type: none"> <li>What is the best way to manage pet wastes?</li> </ul>	<ul style="list-style-type: none"> <li>Difficult to manage wastes like pet wastes will be considered over the course of the study and into the implementation phases of the study. As has been the case historically, these and other difficult to manage components of the waste stream will be addressed as part of the regular integrated waste management system operations.</li> </ul>
<ul style="list-style-type: none"> <li>There are major problems with bag limits particularly if it is set at 1.</li> </ul>	<ul style="list-style-type: none"> <li>The use of deterrents or incentives like a bag limit system will be considered as potential elements of alternative systems at Phases B &amp; C of the study and will be further considered, in more detail if applicable, as part of the implementation strategy at Phase D.</li> </ul>
<ul style="list-style-type: none"> <li>What size of green bin will be used to collect household organics?</li> </ul>	<ul style="list-style-type: none"> <li>The City will be issuing a request for proposals for carts. The size will be part of the analysis.</li> </ul>

Comments Received from Public	Response at Phase A of Study
<ul style="list-style-type: none"> <li>Does the consultant’s participation in the Canadian Energy from Waste Coalition and on other ongoing Energy-from-Waste studies impact or influence the Kingston study?</li> </ul>	<ul style="list-style-type: none"> <li>Jacques Whitford are members of the Canadian Energy from Waste Coalition and are of the opinion that the membership does not conflict with any our current nor past solid waste management planning studies. To be clear, the mandate of the coalition is the fair consideration of established and proven EFW technologies as part of any integrated waste management system. Jacques Whitford are also members of the Recycling Council of Ontario and the Canada Composting Council. These types of memberships are intended for the betterment of the respective industry as a whole and to keep us up-to-date on industry trends and advancements.</li> </ul>
<ul style="list-style-type: none"> <li>How will the study consider the recyclable or compostable materials being generated in high rise residential communities?</li> </ul>	<ul style="list-style-type: none"> <li>High rise residential communities are clearly a challenge with regard to individual tenant/owner participation in diversion programs offered and in the actual capture of a recyclable or compostable stream from those who choose to participate if diversion programs are offered. The ability of alternative approaches, technologies and facilities to accommodate these types of challenges will be a key component of the evaluations to be completed at Phases B and C of the study.</li> </ul>
<ul style="list-style-type: none"> <li>How will the study address the management of certain plastics that should be recyclable but that are not currently collected due to the absence of buyers?</li> </ul>	<ul style="list-style-type: none"> <li>The feasibility of managing plastics has been a factor of available markets and/or technology. As mentioned above, achievement of a 65% diversion rate is based on the optimal use of existing collection and processing technologies and available markets. This will continue to be the case in the future with the achievement of diversion beyond 65% dependent on newer technologies and / or elimination of the production of materials that cannot be recovered or recycled. The study and resulting future system will manage materials in this manner with an increased emphasis on communications and education to ensure available programs are being used correctly by the public and businesses.</li> </ul>
<ul style="list-style-type: none"> <li>Kingston’s current system has most of the sorting occurring at the source versus the more efficient approach of sorting bulked materials</li> </ul>	<ul style="list-style-type: none"> <li>The point at which sorting of materials for recycling or composting will occur will be one of the key considerations undertaken at Phase B of the study. All of the attributes of at-source</li> </ul>

Comments Received from Public	Response at Phase A of Study
after collection.	versus mixed waste sorting will be considered including efficiency, convenience, effort, comprehension, and others.
<ul style="list-style-type: none"> <li>Any increases in costs related to a future waste management system should not be anymore than what the increase in cost of living is assessed at by Stats Canada.</li> </ul>	<ul style="list-style-type: none"> <li>Cost and affordability will be one of several considerations factored into the evaluation of alternative approaches, systems and technologies. At the end of the study, the desired mission and outcome will be a system that balances economic, social and environmental needs of Kingston versus its available resources into the future.</li> </ul>
<ul style="list-style-type: none"> <li>Mall parking lots should be considered for the drop-off of recyclables and compostables by residents.</li> </ul>	<ul style="list-style-type: none"> <li>Locations for the drop-off, sorting and processing of materials will be an important consideration addressed during development of an implementation strategy at Phase D of the study.</li> </ul>
<ul style="list-style-type: none"> <li>Greater time should be used to evaluate the waste energy recovery options such as the pilot project in Ottawa.</li> </ul>	<ul style="list-style-type: none"> <li>Options that can utilize the potentially recoverable energy from residual wastes not deemed suitable for reuse, recycling or composting will be evaluated with regard to a potential role in Kingston's future waste management system at Phases B and C of the Study.</li> </ul>
<ul style="list-style-type: none"> <li>How will the study address the use of private contractors versus city employees for the provision of waste services.</li> </ul>	<ul style="list-style-type: none"> <li>The use of private contractors versus city employees will be a consideration during the actual implementation or application of the long-term waste management system. Private versus public roles for operation of the system should have little bearing on the actual system selected although it is acknowledged that some systems may have a more established track record for each party depending on the technologies being applied.</li> </ul>
<ul style="list-style-type: none"> <li>I hope that the city focuses not only on broadening the recycling program, but making the cost for residents equitable and fair and the process easier and more convenient.</li> </ul>	<ul style="list-style-type: none"> <li>It is the intent of the City to consider the full range of waste management approaches, systems, and technologies over the course of the study. Further, each alternative will be broadly evaluated in the context of costs and benefits to the City of Kingston and its residents and businesses. At this point in time there is no intent to focus on a particular approach, system or technology.</li> </ul>
<ul style="list-style-type: none"> <li>How will residents with barely enough space to store blue boxes accommodate even more</li> </ul>	<ul style="list-style-type: none"> <li>The ability of certain neighborhoods in the City to accommodate additional storage space or</li> </ul>

Comments Received from Public	Response at Phase A of Study
<p>containers as a result of implementing household organics collection?</p>	<p>sorting activity by the user/resident will be a consideration during the evaluation of alternatives at Phases B and C of the study and a paramount consideration during implementation starting at Phase D of the study (e.g. in other jurisdictions where space was restricted in some neighbourhoods, smaller containers and collection vehicles with a tighter operating radius have been specified in the operating contracts).</p>
<ul style="list-style-type: none"> <li>A user friendly website that lists all types of articles and how to dispose of them would be a great asset to the citizens of Kingston.</li> </ul>	<ul style="list-style-type: none"> <li>The power of the City’s website to disseminate information to the public will not be underestimated over the course of the study. It is intended that the City’s current website will be continually enhanced over the course of the study to keep interested parties informed of the study outcomes and that maximum use of the website will achieved at the time of and over the course of system implementation.</li> </ul>
<ul style="list-style-type: none"> <li>The incineration of garbage should be excluded as an option as it causes far too much pollution of our air and water.</li> </ul>	<ul style="list-style-type: none"> <li>Information available from established and proven cases of modern waste to energy facilities indicate that this alternative should, in fact, be considered as a potential component of any integrated waste management system. Accordingly, it will be recommended that the City of Kingston consider potentially applicable waste to energy technologies along with other material processing technologies (e.g. mechanical and biological) in the development of its long-term waste management system.</li> </ul>
<ul style="list-style-type: none"> <li>The use of garburators and the City’s wastewater treatment system to manage household organics should be included as an option in Phase B of the study.</li> </ul>	<ul style="list-style-type: none"> <li>It will be recommended that the City of Kingston consider potentially applicable processing technologies such as garburators and existing wastewater treatment capacity along with other material processing technologies (e.g. thermal and biological) in the development of its long-term waste management system.</li> </ul>
<ul style="list-style-type: none"> <li>Request that members of the public be given every possible opportunity to learn about and participate in this issue (study) that the committee and/or council have open to themselves.</li> </ul>	<ul style="list-style-type: none"> <li>Phase B (Identification of the Preferred Long-term Management System Approach will include at least one public consultation meeting. Also, a status report documenting the identification and description of management system options and the development of evaluation methodology and criteria for the options will be presented to EITP where the public is welcome.</li> </ul>

Comments Received from Public	Response at Phase A of Study
<ul style="list-style-type: none"> <li>Request additional time to gather information, formulate and deliver feedback.</li> </ul>	<ul style="list-style-type: none"> <li>As per the previous comment and response, there will be additional opportunities for the public to provide input into the process. All comments received will be considered and work completed to date will be reviewed and, if necessary, adjusted accordingly in light of the comment received. Given the timeframes of these types of studies the intent is that the process be reasonably iterative to accommodate new information or changing circumstances along the way.</li> </ul>
<ul style="list-style-type: none"> <li>Request that the committee alter the wording of objective d) under Goal 2 to avoid the singling out of landfill.</li> </ul>	<ul style="list-style-type: none"> <li>The recommended wording has been adjusted to read as follows:  <i>d) Minimization of the total amount of residual waste materials with any resource value lost to disposal.</i></li> </ul>
<ul style="list-style-type: none"> <li>Request that consideration of greenhouse gas reductions under Goal 2 Objective e) be expanded to include the effects of all pollutants released from waste and its handling.</li> </ul>	<ul style="list-style-type: none"> <li>The addition of the following objective is recommended and has been incorporated into this final Phase A Report:  <i>e) Consideration of systems and technologies that, at a minimum, limit pollutants generated in the handling of Kingston’s waste to levels allowed by applicable laws and regulations.</i></li> </ul>
<ul style="list-style-type: none"> <li>Recommend that “value” be more clearly defined in terms waste’s value to the environment.</li> </ul>	<ul style="list-style-type: none"> <li>Recommend that the respective objective 2 a) be modified to read as follows:  <i>a) Consideration of best resource value of waste materials to the environment in the design of waste management programs, processes and facilities.</i></li> </ul>
<ul style="list-style-type: none"> <li>Concerned that reference to sustainable “without exhausting the resources it needs” may lead the City to select an incineration avenue and the importation of waste from other municipalities.</li> </ul>	<ul style="list-style-type: none"> <li>Recommend that the respective Goal 5 be modified to read as follows:  <i>A system of programs, processes and facilities that is sustainable in recognition of the capability of the system to be maintained over time without exhausting the resources it needs and without importing resources from other municipalities in a manner that would negatively impact Kingston’s environment.</i></li> </ul>
<ul style="list-style-type: none"> <li>Suggestion that system should limit costs to taxpayer rather than minimize the costs associated with such an important service.</li> </ul>	<ul style="list-style-type: none"> <li>Recommend that the respective Goal 7 be modified to read as follows:  <i>A system that limits costs to the taxpayer through the full evaluation of:</i></li> </ul>

Comments Received from Public	Response at Phase A of Study
<ul style="list-style-type: none"> <li>Request that a statement be included in the report indicating that there is still much debate about the hierarchy presented in Section 3.1 of the report and that the City should remain flexible and not dogmatic in following the hierarchy listed specifically in the draft report.</li> </ul>	<ul style="list-style-type: none"> <li>It is the intent of the City to consider all information currently available for the alternative technologies, systems and approaches as they may apply to the City of Kingston. We are not aware of any ongoing debate between technologies but do understand that the current challenge is to arrive at the appropriate mix of system components that can be sustained and maintained into the future.</li> </ul>
<ul style="list-style-type: none"> <li>Request that a statement be included in the Phase A report that identifies controversy with hierarchy placing “thermal treatment with energy recovery” above “landfill with energy recovery”.</li> </ul>	<ul style="list-style-type: none"> <li>We are not aware of any controversy between landfill and thermal treatment technologies but do recognize that the two approaches exist at the bottom end of the hierarchy. It is the intent of the City to consider these two disposal options only after the higher priority diversion options have been fully explored and implemented. When considered, they will be evaluated using the best available information for each and implemented accordingly.</li> </ul>
<ul style="list-style-type: none"> <li>Request that a more sophisticated waste audit be conducted before the current goals are accepted and before Phase B of the study commences.</li> </ul>	<ul style="list-style-type: none"> <li>As the study proceeds the City and its consultants will continue to use the best available waste audit data and will recommend the collection of more Kingston specific audit data if necessary. The data base compiled by Stewardship Ontario is extensive and we expect will be useful for all waste management planning studies in the near future.</li> </ul>

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## 6.0 NEXT STEPS

Following approval of the Phase A Report, the study would proceed to Phase B, Identification of a Preferred Long-term Management System Approach, based on the goals and objectives established in Phase A.

Phase B will involve the following:

- Step 4 – Identification and Description of Management System Options

In Step 4 a set of alternative waste management system options will be identified and described. The system options will expand upon the preliminary diversion scenarios outlined in this report and would address both short and long term needs. The descriptions will focus on the basic application and capabilities of each system as the basis for evaluation in Step 5.

- Step 5 – Development of Evaluation Methodology and Criteria for Management System Options

Step 5 will entail the development of a methodology for the evaluation of the alternative management systems. This step will include a consultation event to provide for stakeholder input, regarding the alternative systems and proposed evaluation methodology.

- Step 6 – Evaluation of Management System Options and Identification of Preferred Approach

In Step 6 the evaluation methodology defined in Step 5 will be applied to the system options defined in Step 4 and a preferred Management System Option would be identified.

- Step 7 – Decision on Future Management System Approach

The recommended preferred system would be presented to EITP and Council and the steps for undertaking “**Phase C** – Identification of Preferred System Technologies and Practices” would be confirmed.

Following approval of the future management system approach, Phases C and D of the Integrated Waste Management Study would proceed including:

- 🗑 Phase C – Identification of Preferred System Technology and Practices

- Step 8 – Request for Information (RFI)
- Step 9 – Request for Proposals (RFP)

- 🗑 Phase D – Development of Preferred System Implementation Strategy

- Step 10 – Recommendations on Collection and Processing Contracts and Agreements
- Step 11 – Identification of Next Step Implementation Activities