



City of Kingston
SOLID WASTE SERVICES
SITUATION ANALYSIS REVIEW



May 2002
Prepared for the Solid Waste Task Force
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1. Background

On February 20, 2001 Kingston City Council developed a Solid Waste Task Force to examine current waste management practices and to develop short and long-term recommendations consistent with an overall vision.

In order to help achieve its mandate, the Task Force adopted a strategic planning model as a methodology to assist in completing an analysis of Solid Waste Services.

The “Model” is a five-step, or ABCDE Model and is summarized as follows:

Step A: Where do we want to be? Define our Public Policy Objectives and Vision

Step B: How will we know when we get there? Define our Outcome Measures

Step C: Where are we today? Assess our Current State.

Step D: How will we get there? Develop our Strategies

Step E: What will or may change in the future? Monitor, Evaluate and Adjust.

To date the Task Force has completed Steps A and B and this document is intended to complete Step C. This process will guide the municipality by implementing a strategic Solid Waste Plan based on public policy, performance measurements and industry data.

1.1 Step A – Public Policy Objectives and Vision

Members of the Task Force and staff worked together to define our Public Policy Objectives by asking ourselves, “*What are we trying to achieve through this service?*” Questions considered were:

- *Why are we in this business / What is the purpose of this service?*
- *What high-level community needs are we trying to address through this service?*
- *What end results are we trying to achieve? What does our ideal future look like?*
- *What are our measurable Public Policy Objectives for this service?*

It was agreed that municipal governments generally provide services to address the following Public Policy Objectives:

1. Public Health & Safety – promote a healthy and safe physical and mental environment for residents of and visitors to the City of Kingston.
2. Environmental Sustainability – ensure the establishment and maintenance of a clean, healthy environment in which environmental factors support the physical and mental well-being of the community.
3. Wealth Redistribution – ensure the equitable distribution of wealth across the community so that all members, regardless of social and economic background are provided essential life services.
4. Access – ensure that residents have equal access to community programs.

Solid Waste Review – Where we are Today

5. Economic Sustainability – provide for the growth and expansion of the City’s various economic sectors including commerce, industry, tourism, government administration and the health, educational, corrections and military institutions.
6. Community Development – contribute to a higher quality of life for all residents.

Each of the above six objectives were discussed and we asked ourselves, “*What are we trying to achieve through this service?*” Scores were assigned by each representative and summarized as follows:

<u>Public Policy Objective</u>	<u>Average Score</u>
1. Public Health & Safety	4.7
2. Environmental Sustainability	5.0
3. Wealth Redistribution	0.3
4. Access	1.8
5. Economic Sustainability	3.3
6. Community Development	2.4

After we scored and considered the Public Policy Objectives we developed our vision.

The City’s Vision Statement for Solid Waste Services was approved at the April 16, 2002 Council meeting as follows:

“The City of Kingston provides Solid Waste Services to protect the health, safety and natural environment of our citizens through fiscally responsible, efficient and effective practices that encourage waste reduction and recycling, and that promote economic prosperity by ensuring a clean, healthy and beautiful city.”

1.2 Step B – Outcome Measures

A balanced set of well defined outcome measures is required to help assess whether or not we are achieving our vision and to alert us if we veer off course. The following Measures were approved by Council together with the Vision Statement:

Effectiveness Measures:

Diversion Rate – percentage of residential solid waste diverted through reduction, reuse, recycling and composting based on current flow;

Generation Rate – annual amount of residential waste generated per capita;

Citizen’s Perception – survey on value of Solid Waste Services for tax dollars;

Visitor’s Perception – survey on cleanliness of Kingston streets and open spaces.

Efficiency Measures:

Garbage Collection – operating costs for garbage collection per tonne;

Garbage Disposal – operating costs for garbage disposal per tonne;

Solid Waste Diversion – operating costs for solid waste diversion per tonne;

Solid Waste Management – average operating costs for solid waste management per tonne.

Solid Waste Review – Where we are Today

To get an accurate picture of our service delivery performance we wanted to measure both efficiency and effectiveness. Efficiency indicators measure the cost of service delivery whereas effectiveness indicators measure the quality of service delivery.

Using the above criteria, we considered numerous outcome measures for the primary Public Policy Objectives of Environmental Sustainability; Public Health & Safety; and Economic Sustainability; as well as considering fiscal responsibility. When selecting the proposed Outcome Measures, we considered how well a measure related to the Vision Statement and how difficult it would be to gather information. All Efficiency Measures and the Diversion Rate Effectiveness Measure are already being captured and reported through the Municipal Performance Measurement Program (MPMP) for the Ministry of Municipal Affairs and Housing. The Citizen and Visitor Perception measures will provide customer feedback. The Generation Rate measure will provide a picture of the amount of waste being generated.

1.3 Step C – Our Current State

After completing Steps A & B we were now ready to complete **Step C – Where we are today**. This is an examination of our current state with respect to costs, service delivery, operational challenges and opportunities. Further, we reviewed the industry to identify trends in the marketplace and best practices. This will form a solid foundation for us to develop our Strategies – Step D and further Monitor, Evaluate and Adjust our plan – Step E.

2. Executive Summary

2.1 The Scope

The Solid Waste Task Force instructed us to research our Current State and to report on the challenges and opportunities for the City of Kingston to reduce what is going to landfill and achieve a 50% diversion rate. This objective is in line with the ongoing Provincial initiative to achieve the same goal. Despite the fact that final legislation has not yet been passed, municipalities across Canada are investigating and implementing programs to this extent. With respect to achieving this goal, we were specifically instructed to research the opportunity and associated impact of:

- increasing recycling on the streets and in public spaces
- increasing backyard and municipal composting
- implementing an expanded bag tag or user-pay system

2.2 The Current Situation:

As a result of amalgamation, the City's current solid waste service operation includes a variety of service providers by-laws and funding mechanisms, based on the practices of the former entities.

Based on 2001 Municipal Performance Measurement Program (MPMP) the City is presently achieving a 38% diversion rate. The 2001-2002 Quality of Life indices that was recently reported by the Social Planning Council indicates that since 1996 Kingston has slightly increased the amount of waste we diverted from landfill. While a positive trend is always good news, our research indicates there is plenty of room for improvement. Since the new City was formed, communications in this area have been specific to notifying the public of service delivery changes. There has been limited promotion and public education with regard to diversion.

All our municipal services and programs require continuous review to identify opportunities to improve the efficiency and effectiveness of our service delivery. While we recognize that Solid Waste Services would benefit from complete operational review we have maintained our focus to addressing only those issues that will help us achieve our diversion objective. That being said, the strategies that are adopted as a result of the Task Force work will certainly contribute to service enhancements. Identifying and acting on operational improvements outside the scope of this mandate will continue to be undertaken as part of our day-to-day job.

3. Conclusions

Our ability to achieve our objective will rely heavily on our ability to educate our residents and encourage them to change their usage patterns and behaviours. We recognize some residents are presently doing an excellent job of diverting waste from landfill and an effective Solid Waste strategy will reward them for their efforts.

Solid waste is a complex and extremely important municipal service and no single method or strategy will help us achieve our vision. Our research indicates that the most effective approach to achieve our vision would be through the adoption of strategic policy and the resulting service delivery changes, coupled with ongoing promotion and education.

Based on our research of the Solid Waste Industry, the trends in the marketplace and the current situation here in Kingston we have drawn the following conclusions:

3.1 There is the potential to reach our 50% diversion rate by educating and promoting backyard composting and improved recycling habits.

3.1.1 Rationale

- The Waste Audit conducted by J. L. Richards in August 2001 indicated that the residents in the study area were “better” recyclers than the average Kingston resident. However, even in this above average neighbourhood, 22% of the total garbage stream consisted of material that could have been diverted through a backyard composter. An additional 8% of the garbage waste stream consisted of blue box recyclables.
- Our current adoption rate of backyard composters is below the industry average. The data published in the Recycling Council of Ontario 2000 annual report showed an ongoing participation rate of approximately 75% of Canadian households within most Canadian municipalities. The Solid Waste Division estimates the City has sold approximately 20,000 backyard composters but is unsure how many are currently in use. Even using the high figure of 20,000 this is only a penetration rate of 45%.
- The City of Kingston has achieved 38% diversion with very little promotion and education. Municipalities across Canada are spending significant dollars on staff resources and promotion and public education materials. The Solid Waste industry has embraced the effectiveness of P&E as one of the key drivers in increasing diversion.

Solid Waste Review – Where we are Today

- We can conservatively target a 13% increase in our diversion rate by adopting an aggressive Public Education strategy. We established this percentage by targeting half of the potential backyard compostable material and 25% of the potential blue box material identified in the waste audit.

3.2 Pay as You Throw plays an integral part in encouraging waste diversion

3.2.1 Rationale

- The Solid Waste Industry is continuing to move to a “utility” based pricing model. By implementing Pay as You Throw systems, residents make the connection between their disposal habits and costs. It provides an incentive for residents to make smarter choices when purchasing products and disposing of them.
- The Statistics clearly show that implementing Pay as You Throw has a drastic impact on the municipal waste generation rate. Brockville showed a 26% drop in tonnage after the first week of changing from a two bag limit to a one bag limit. Trenton showed a 40% reduction after only 20 weeks. Loyalist Township implemented Pay as You Throw in 2002 and showed a decrease in garbage of 46% in the first quarter. **Consideration must be given to the fact that these percentages are not pure. Implementing Pay as You Throw may cause the generators to switch service providers, thereby reducing overall tonnage.**
- Implementing a Pay as You Throw system the City will require the standardization of service delivery and funding formulas across the entire City of Kingston. This will achieve the desired operational objective of consolidating the by-laws.

3.3 Promotion and Public Education is an integral part of a successful Solid Waste strategy

3.3.1 Rationale

- A Promotion and Public Education plan is the cornerstone of any effective Solid Waste Strategy. The promotion and education plan should be developed within the context of a strategic Solid Waste Plan. This plan will be used to reinforce the public policy objectives set by Council and to help residents understand how to effectively integrate the 3R's into their daily lives.
- To effectively implement any form of Pay as You Throw system it is vital that the municipality properly inform residents on the methods of waste diversion. Further, the municipality must ensure residents are given advance notice and materials such as blue boxes and composters are easily obtained.

3.4 Expand recycling opportunities to areas where we don't currently offer this service.

3.4.1 Rationale

Solid Waste Review – Where we are Today

Expanding our current service area includes providing recycling bins in open spaces and municipal buildings as well as exploring opportunities to expand the service in the downtown area.

Our limited research time did not allow us the opportunity to identify diversion percentages for this strategy. Regardless of the diversion opportunity we feel it is important that we lead by example and take advantage of every opportunity to divert waste. For this reason we conclude that collecting in open spaces is a strategy that should be adopted.

Expanding service in the downtown presents many challenges and potentially a substantial investment to modify our equipment. We researched blue bag collection as a possible solution to the downtown however we feel this strategy requires more involved research and could be explored as a longer term objective.

3.5 Implement a Wet-Dry Program

3.5.1 Rationale

Our research indicates that by implementing a two stream wet-dry system we could achieve in excess of 70% diversion. This is due to the fact that municipal staff would be sorting the waste and therefore capturing essentially all the material that can be diverted. A wet-dry strategy could require a substantial capital investment for vehicles and plant so we feel this opportunity would be best considered as a longer-term objective that would be worthy of the development of a business case.

4. Solid Waste – Where we are today – in Kinaston

Today, Solid Waste Management is one of the key priorities of almost every municipality in North America. With diminishing landfill capacity, environmental concerns and public awareness at the forefront, the desire to reduce the amount of garbage going to landfill has never been greater. The 3R's of the 80's are no longer voluntary programs for the environmentally conscious. Today, the ability to implement programs that divert waste from landfill is a fundamental part of service delivery.

The City of Kingston recognizes the need, today, to be an efficient, effective, environmentally responsible municipality in the way solid waste services are delivered to our residents.

4.1 Solid Waste By-Laws

Since amalgamation, the Solid Waste by-laws have not been consolidated. Accordingly, funding for solid waste services, which includes garbage collection and disposal including large article disposal; recycling collection, processing and disposal; household hazardous waste; leaf & yard waste collection; composting site operations; and landfill site operations, is through a mill rate charged against all properties in Kingston East and Central, and a flat fee charged to residential properties only in Kingston West. In addition, there are different restrictions on the maximum weight of garbage bags for the three areas of the City.

4.2 Who we Serve and How it is Funded

From strictly a waste diversion perspective, our current collection practices pose some problems for the Task Force in reaching the 50% diversion goal. The City does not collect ICI recyclables so the practice of collecting ICI waste in the central and east parts of the City causes the diversion rate to appear significantly lower. This is further complicated because the City does not collect recycling and composting from the residential component in the BIA and there is no way to measure the diversion of multi-residential properties.

As a result of amalgamation the City has a variety of Solid Waste funding structures. In the Central and East areas of the City funds are raised through a general mill rate applied to all property classes based on assessed property value. In the West area of the City a flat rate of \$145.56 is applied to all residential properties and no levies or flat rate is applied to the ICI sector.

Waste collection and disposal levies which are not rebated are available to fund other waste management programs including, Household Hazardous Waste, leaf and yard waste collection, compost site operations, public trash barrels, large article disposal, and the balance of garbage and recycling services provided to other properties.

We asked the Finance Department to provide some tax information. Today, a residential property with a Current Value Assessment of \$150,000 pays a different rate in each area of the City as follows:

East = \$93.07

Central = \$122.48

West = \$145.56

4.3 Rebate system

The City presently offers a rebate program for ICI and multi-residential property owners who choose not use the City of Kingston waste collection and disposal service. The rebate system is as follows:

- Multi-unit residential property owners in the entire city are able to apply for a rebate of 80% of their waste collection and disposal levy.
- Commercial and industrial property owners in the City Central and East are able to apply for a rebate of 80% of their waste collection and disposal levy if they do not use the City's services. This is not available to City West property owners as they are not assessed a waste collection and disposal levy.
- Institutional property owners that are otherwise exempt from taxation but are required to pay rates levied for waste collection and disposal are able to apply for a rebate of 60%.
- Vacant land is not subject to rebates. Tax rates are legislatively reduced as a result of their vacant status, however, the entire waste collection and disposal levy is retained.

5. Garbage Collection & Disposal

5.1 Residential Collection

Residential garbage is collected throughout the entire City by staff of the Solid Waste Division. There is presently a three-bag limit throughout the City of Kingston with additional bags requiring a tag at a cost of \$2.00 per tag. Bag tags may be purchased at the following locations throughout the City.

- City Hall, 216 Ontario Street
- Counter Street Municipal Office, 211 Counter Street
- Kingston Area Recycling Centre, 70 Lappan's Lane
- Bennett's Valu-Mart, Rideau Town Centre
- Cataraqui Town Centre (Customer Care Booth), 945 Gardiners Road
- Kingston Mills Esso Station, R. R. # 6, Kingston

5.2 Industrial, Commercial and Institutional Collection (ICI)

The City of Kingston currently collects approximately 8,000 to 8,500 bags of garbage per week from approximately 450 commercial properties in Kingston Central plus a minor amount in Kingston East. This equates to an average of 18 bags of garbage per commercial property. The weight is estimated at 4,200 – 4,400 tonnes annually using a factor of 10 kg per bag, or about 18% of the waste collected.

There are approximately 1,155 commercial and industrial properties in Kingston Central. Approximately 325 of these properties were issued rebates in 2000. This leaves 830 properties that theoretically would be collected by the municipality, however, we only collect from about 450, or 39% of the total, leaving the balance 380, receiving neither collection or rebates. This

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could be due to taxes being in arrears, land being vacant, or lack of knowledge of the rebate program.

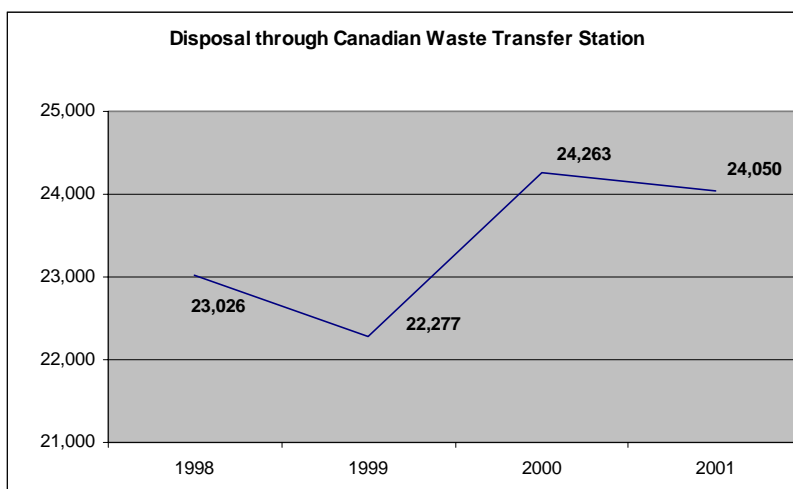
In Kingston Central and East, City staff collect ICI garbage. There is no collection for the ICI sector in Kingston West. The 3-bag limit applies to ICI customers in Kingston East, however, there is no bag limit for ICI customers in the central area of the City.

Private contractors collect ICI garbage in Kingston West.

5.3 Disposal

The City presently has two options to dispose of waste. The majority of the City's waste is sent to out of town landfills under a contractual agreement with Canadian Waste Services. Residents may also dispose of garbage at a City owned landfill located at 4th Concession Road in the east area of the city.

As outlined earlier, the majority of municipalities that have developed "state of the art" Solid Waste Facilities, in particular Wet-Dry operations, once owned and operated their own landfill. Due to the realization that they needed to close or drastically reduce the amount going to their landfill sites, these municipalities earmarked substantial funds to develop and implement excellent diversion programs.



While the City does not presently face such a situation, Council has chosen to take a proactive approach in developing a strategic Solid Waste Plan that will better serve the environment and the community.

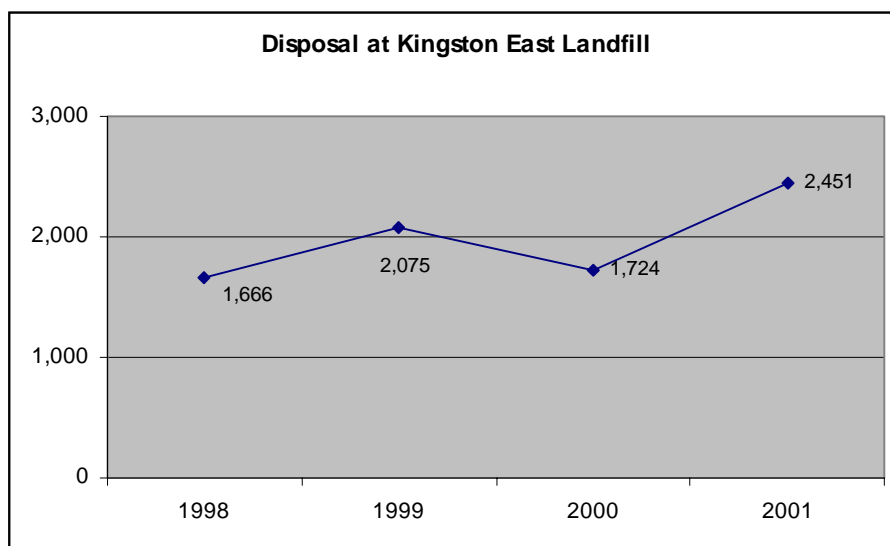
The graph indicates that overall disposal figures have risen slightly from 1998 to 2001. The slight increase may be due to an increase in the population but the fact that the trend line is not leveling out or declining may be an indication that Kingstonians as a whole are not improving their diversion habits. Over this period ICI garbage was collected in the central and east parts of the city making it harder to gauge specific residential waste generation and diversion. From 1998 to 2002 total tonnage disposed of by Canadian Waste increased by approximately 4%.

5.4 Landfill

The Solid Waste Division operates the landfill site located on the 4th concession off Joyceville Road. Residents are responsible for disposal costs outside the free large article drop off periods. Residents may also use the services of various private transfer sites/contractors from the Kingston and surrounding areas. The table below compares the Kingston East Landfill to Canadian Waste.

	Kingston East Landfill	Canadian Waste Transfer Station
Hours of Operation	Tuesday to Saturday 8:30 a.m. to 4:00 p.m.	Monday to Friday – 7:00 a.m. to 4:00 p.m.
Cost of Disposal	There is a minimum fee of \$15.00. Additional charges are based on a net weight of \$110 per tonne, prorated	Provided to the City at a cost of \$76.66 per tonne.
Disposal of White Goods	\$20 with freon	\$30 with freon, \$10 without
Tires less than 16” off rim	\$3.00	\$5.00
Tires greater than 16” off rim	\$8.75	Not accepted
Leaf and yard waste	No charge	Not accepted

The annual tonnage shows a similar increase than that found with the Canadian Waste Transfer Station. However, the percentage of garbage going to the Kingston East Landfill compared to the total amount of garbage being disposed is increasing. In 1997 6.75% of all garbage being disposed was going to the Kingston East Landfill compared to 9.25% in 2001. Further the overall tonnage increased by approximately 47% from 1998 to 2001.



5.5 Free Large Article Drop Off

The City of Kingston presently offers residents eight weeks throughout the year to drop off large articles to either the Kingston East Landfill or Canadian Waste Transfer Station at no charge to the customer. This program costs the City of Kingston approximately \$150,000 annually.

Items received during the large article drop off period are included in the City’s overall waste generation. Promotion of “free” large article drop off does not necessarily support waste reduction or diversion. There are organizations throughout the City that offer residents alternatives that would further the City’s 3R objective. This may include private companies offering to refurbish articles for resale or non-profit charitable organizations looking to aid the less fortunate in the community.

During the year’s 2000 and 2001 the City collected an average of approximately 1,600 tonnes of waste during the large article periods.

6. Recycling

6.1 Blue Box Program

The Solid Waste Division collects residential recyclables from City Central and contracts out residential recycling collection for Kingston East and West to BFI Inc. Loyalist Township contracts recycling collection to the City which is contracted to BFI. There is no residential recycling pick-up in the downtown area.

Processing recyclables at the Material Recovery Facility is performed by contract to BFI Canada.

Residents are provided one blue box free of charge and can purchase replacement boxes or additional boxes from the Material Recovery Facility for \$6.00 per box.

The recycling program is voluntary and there are no by-laws that require recycling. The City of Kingston does not provide blue box collection service to Commercial, Industrial or Institutional customers.

The current recycling program is “source separated” which means operators place the blue box on the truck and sort the materials into several compartments. This is time consuming and reduces the number of households that can be collected per route, however, increased efficiency at the MRF.

6.2 Multi-residential Recycling program

The multi-residential recycling program utilizes both blue boxes and roll out totes to collect recyclables from apartments and high density housing complexes. Typically buildings with less than 25 units are provided service using blue boxes only.

Materials Accepted

O. Regulation 101/94 passed under the Environmental Protection Act describes the required Blue Box Waste Management System and the Leaf and Yard Waste System. This regulation determines five materials that must be included in a municipality’s recycling program and further that at least two additional items be included from a supplementary list of twelve. The mandatory items are:

- Aluminum cans
- Steel cans
- Glass bottles and jars
- Newsprint
- Polyethylene terephthalate (PET) containers (#1 plastics)

The two additional materials must be collected from the following supplementary list:

Aluminum foil	Film plastic (#5)
Boxboard	Rigid plastic containers
Cardboard	Telephone directories
Expanded polystyrene (#6)	Textiles
Fine paper	Polycoat paperboard containers (milk cartons and tetra packs)
Magazines	
Paper cups & plates	

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The City of Kingston presently collects all of the mandatory and supplementary items except textiles.

The list above shows that there is very little room to expand recycling collection by increasing the number of items collected. While preliminary discussions indicate the possibility of adding empty aerosol and paint cans, the overall impact on diversion would be relatively minor. The major challenge is the ongoing education of residents about what is recyclable and how it is to be sorted.

6.3 Industrial, Commercial and Institutional Recycling

The City does not provide recycling collection for the ICI sector, however ICI organizations may drop off recyclable material at the Material Recovery Facility. A monthly rate sheet identifies fees and rebates that apply by material and quantity.

6.4 Recycling Revenue

The municipality is able to recoup some costs by selling the recyclable products. In 2001 this amounted to \$1,080,000. There are great differences in the revenue received for various items. For example, the City of Kingston generated an average net revenue of \$1,716 per tonne for aluminum in 2001 versus a net average loss of \$24 for glass. The average revenue for 2001 was approximately \$100 per tonne.

7. Composting

As outlined in the next section, “Where we are today – the Industry”, Composting is divided into three main categories, Backyard Composting, On-Site Composting and Centralized Composting. Centralized composting is divided between leaf and yard waste and household organics. The City of Kingston presently offers a centralized composting facility for leaf and yard waste materials but not for household organics.

The practice of collecting household organics is the “Wet” part of “Wet-Dry” program. Corcan, which is described below, is the only facility presently available within the City to process “non backyard compostables”. The composting facilities identified below refer to leaf and yard waste materials.

The City of Kingston presently manages two composting and brush facilities. A small site is located at the Kingston East Landfill and the main central site is located beside the Material Recovery Facility on Lappans Lane. A private contractor, Compost Management, currently manages both operations. Loyalist Township is a founding partner in the central site and shares in the operating costs.

In 2001 the City Composting and Brush sites handled over 4,000 tonnes.

7.1 CORCAN

In the early 1990’s, the City of Kingston and Kingston Township were faced with a pending landfill closure and in the process of searching for a new site. In consideration of reducing the amount of garbage that would be sent to a new municipal landfill, they contributed to the construction costs of a residential and commercial organics composting facility at the Joyceville Penitentiary together with the Township of Pittsburgh. The facility was a venture of CORCAN,

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where federal inmates are taught life skills that they are able to utilize after release from prison. A pilot organics collection program, utilizing a cart based collection system, was implemented in the Meadowbrook subdivision which has subsequently been terminated. CORCAN has put the City on notice that the facility will be closed as of June 28, 2002 due to economics. The Corcan facility would constitute the “Wet” part of a Wet-Dry program.

7.2 Backyard Composting

The City of Kingston sells backyard composters for \$30.00 each. Operations staff estimates the City has sold approximately 20,000 backyard composters to date. It is further estimated that each composter diverts 100 kilograms of material each year. Residents may also bring compostable materials to either facility at no charge.

8. Leaf and Yard Waste Collection

Leaf and yard waste, including brush, is collected once a year in November.

Residential yard waste can be dropped off for free. However, there is a disposal fee of \$50 per tonne for commercial yard waste. If yard waste is from a residential source but delivered by a lawn care company, it can be disposed for free providing the hauler has a letter from the residential property owner.

Presently residents are encouraged but not required to put leaf and yard waste in brown paper bags for the fall municipal collection.

9. Household Hazardous Waste

The City of Kingston presently offers a Household Hazardous Waste drop off every Thursday and 2nd Saturday of each month. The program runs from April through November from 9:00 a.m. to 2:00 p.m.

Materials Accepted

Toxic

- Eg: Pesticides, Rat Poison, Pharmaceuticals, Cleaning Fluids, Medications

Flammable

- Eg: Gasoline, BBQ Starter, Motor Oils, Solvents, Propane Cylinders, Paints

Corrosive

- Eg: Battery Acids, Drain Cleaners, Oven Cleaners, Auto Batteries, Dry Cell Batteries

Reactive

- Eg: Pool Chemicals, Ammonia, Bleach

Needles

10. Waste Diversion Habits?

When looking at areas to increase waste diversion we must remember that any effort to increase waste diversion will require the cooperation of the municipality and the community. The level of cooperation may vary but in the end the municipality must provide the residents the information, policies and tools to assist them in waste diversion. The resident then must take an active role in taking a responsible approach to their solid waste activities.

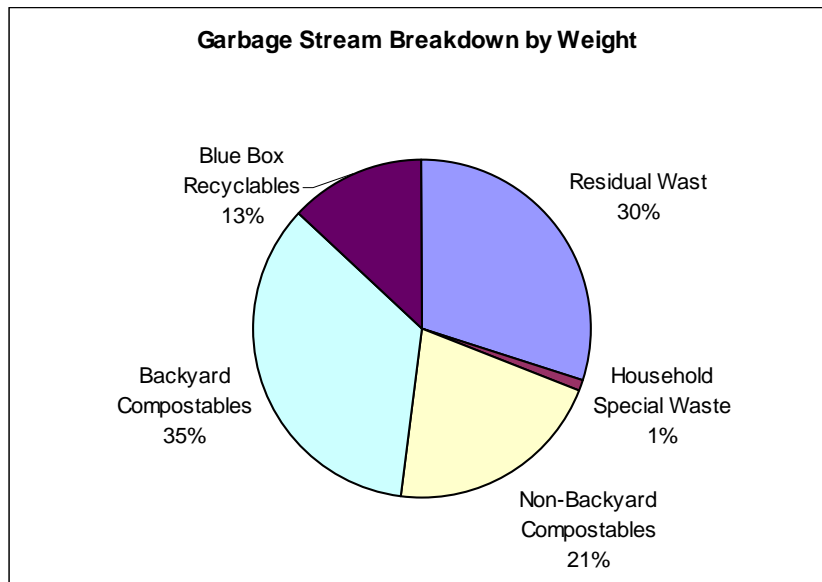
10.1 The Residential Waste Stream – Waste Audit

In August 2001 the City hired J.L. Richards to perform a waste audit. Some of the highlights are outlined below.

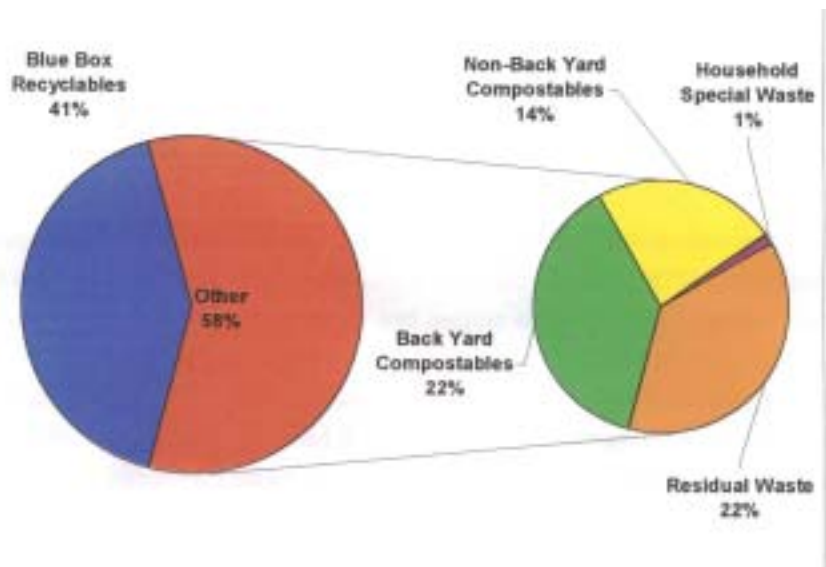
From a residential waste perspective the waste audit results indicate that there is substantial quantities of materials in the garbage stream that could be diverted. During a three- week period 34 homes, consisting of 6 row houses and 28 single detached homes had their garbage and recycling collected and examined to gather a level of understanding of the waste diversion habits of Kingstonians.

The graph on the right shows the breakdown of residential garbage, by weight in the study area.

Compostable material was broken down into non-backyard compostables (pet waste including litter, woody yard waste, animal-based food waste) and backyard compostables (vegetable-based food waste, yard waste, grass clippings, and other yard waste) Pet waste was considered non-backyard compostable due to the potential negative health effects of food grown using compost with a pet waste component.



As the graph indicates, 30% of the bags weight is actually made up of materials that have no other waste disposal alternative. The graph also shows that further diversion could be achieved through traditional recycling (13%) while 35% of the weight was made up of materials that could have been disposed off in a backyard composter.



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The second graph shows the adjusted breakdown of combined waste streams (recycling plus garbage). This further shows the opportunity to increase diversion through composting.

This study did indicate that the study group was likely better than average in recycling participation, however, if we use the statistics gathered in the study and calculate some hypothesis based on 2001 landfill tonnage some interesting figures come to light.

The total curbside tonnage collected in 2001 was approximately 24,300 tonnes. Assuming 13% of this could have been diverted to recyclables, 35% diverted to backyard composting and 21% diverted to non-backyard composting the total tonnage would be reduced by over 16,700 tonnes. Recognizing that this would be next to impossible to achieve, it does show that even if the City of Kingston were to achieve half of these figures a significant amount of waste would be diverted from landfill.

Additional trends that were identified in the Waste Audit included:

- The waste generation rates from the audit were 600 kg/hhd/y for garbage and 350 kg/hhd/y of blue box material, for a total of 950 kg/hhd/y of combined waste.
- The generation rate of backyard compostable material in the garbage stream per household extrapolated for a single year, adjusted by including yard wastes for only six months out of the year, is 175.5 kg/hhd/y
- A number of garbage bags were entirely grass and yard waste.
- Organic material represented 56% of the garbage stream by weight. The diversion of this material would significantly reduce the amount of material going to landfill. The cost per household per year in transfer station fees alone is 56% of 600 kg/hhd/y at \$76.66/tonne (current fee at CWS Transfer station) or \$25 per household. A complete financial analysis of an organic collection system was beyond the scope of the report.
- Ignoring any potential savings in the collection of the garbage stream, a 50% reduction in the amount of backyard compostables in the garbage stream would save \$180,000 per year (calculated as 50% x 175.5kg/hhd/y x 28,300 hhd x \$76.66/t). It can also be noted another significant potential savings from the sale of additional recovered metal, primarily aluminum trays and foil, of which approximately 90% is not currently recycled
- 75% of the total waste stream is made up of 12 items, 10 of which are potentially divertable from landfill.
- Blue box materials and backyard compostables are almost 50% of the material put out as garbage by weight.

11. Collection in Open Spaces and Municipal Buildings

The City of Kingston presently does not offer recycling receptacles in public spaces and municipal properties such as parks, arenas and some municipal buildings. The only option available to pedestrians to dispose of recyclables on city streets is by using traditional garbage

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receptacles. In 2001 City Parks, Utilities and Roads crews disposed of over 200 tonnes of garbage. If we apply the 41% of recyclable materials from the waste audit the City could potentially divert approximately 80 tonnes from landfill by providing options in open spaces and municipal buildings.

11.1 Public Perception

The most important aspect of collecting recyclables in open spaces in the public's perception of the municipality's commitment to responsible Solid Waste Management. This is especially important for municipality's implementing user pay programs. It is the classic case of leading by example. While this program will not significantly impact the overall diversion figures it will certainly help in achieving a cooperative approach to Solid Waste management in a community.

12. Promotion & Public Education

The City presently does not have a dedicated resource assigned to the Promotion and Education of Solid Waste Services. There is considerable content on the City of Kingston website but there is not active and ongoing resources allocated to this function.

13. Solid Waste – Where we are today – The Industry

In order to gain a better understanding of the opportunities and challenges we researched Solid Waste from an Industry perspective as it relates to our local situation.

Over the past few years the Provincial Government has been working towards a 50% waste diversion goal compared to 1987 base year data. The Ministry of Environment, through Waste Diversion Ontario, was expected to introduce legislation – Bill 90, in the second half of 2001 to develop, implement and fund waste diversion programs and require industry funding organizations to contribute up to 50% of the costs, however, to date the bill has received first reading only.

One of the challenges the Province must consider is what sectors diversion will apply to. A significant number of municipalities do not collect Industrial, Commercial and Institutional Solid Waste and therefore have no influence on the entire diversion rate within their municipality. Based on this fact most municipalities—are proceeding under the assumption that the 50% waste diversion goal will be based on residential garbage only.

Bill 90 is viewed by many public and private organizations as a major step forward for the industry and the environment.

14. Industry Organizations

There are numerous organizations in the Solid Waste field. Those selected below are based on discussions with industry professionals and the availability of published content. The list is not meant to be inclusive of all industry organizations. As municipalities continue to operate under tight fiscal budgets while continuing to be faced with new challenges it will be crucial for them to work together to achieve common goals. Some of the organizations below have already

published excellent reports and are continuing to help municipalities implement innovative Solid Waste programs.

Ontario Municipal CAO's Benchmarking Initiative (OMBI) – Solid Waste Panel – a voluntary partnership between many large municipalities and regions focused on a process to benchmark municipal performance, generate “best practice” insights and improve service costing.

Waste Diversion Organization (WDO) - Ontario's Environment Minister announced the formation of the WDO on November 3, 1999 to help the province fulfill its commitment to achieve a 50% diversion of waste from disposal and to recommend options to provide funding support to Ontario's residential recycling system.

Compost Council of Canada - The Composting Council of Canada is a national non-profit, member-driven organization with a charter to advocate and advance composting and compost usage. It serves as the central resource and network for the composting industry in Canada and, through its members, contributes to the environmental sustainability of the communities in which they operate.

Municipal Waste Integration Network (MWIN) – this is a group of concerned municipal and industry representatives from all sectors of the waste management business. The goal of MWIN is to provide municipalities with a strong base of stakeholders from within the municipal waste management industry ready and willing to provide an effective voice to government.

Corporations Supporting Recycling (CSR) - is a Canadian, not-for-profit, private sector organization that represents the packaging stewardship interests of consumer products and packaging industries.

With a membership of about 120 international, national and local ‘brand owner’ corporations and companies, CSR’s work with all levels of government, particularly municipalities, as well as non-government organizations and other industry groups to help develop sustainable municipal recycling and waste diversion systems.

Recycling Council of Ontario (RCO) – The RCO was started in 1978 and is a not-for-profit organization committed to minimizing society's impact on the environment by eliminating waste. RCO's mission is to inform and educate all members of society about the generation of waste, the avoidance of waste, the more efficient use of resources, and the benefits and/or consequences of these activities.

The Association of Municipal Recycling Coordinators (AMRC) – The AMRC's focus is on information geared towards municipal or industry use. AMRC works with municipalities in researching and reporting on industry trends to better allocate resources.

The Federation of Canadian Municipalities (FCM) - The FCM administers two programs that could provide funding opportunities for Solid Waste initiatives. The first is the Green Municipal Enabling Fund (GMEF) which is a \$25 million Fund that provides grants to support feasibility studies. Operating from 2000 to 2005, GMEF expects to support up to 150 studies a year to assess the technical, environmental and/or economic feasibility of innovative municipal projects. Grants cover up to 50 per cent of eligible costs to a maximum grant of \$100,000.

Feasibility studies must explore projects that would improve air, water or soil quality, protect the climate or promote the use of renewable resources. The projects must also show potential for significant improvements in environmental performance or energy efficiency in:

- municipal buildings and facilities
- energy services and renewable energy
- water supply, sewage treatment or storm runoff management
- solid waste management
- public transportation services, advanced public transit technologies or municipal fleets

Studies must add to the national knowledge base on innovative technologies or practices and their regional implementation. The projects they study must have potential to generate significant, measurable and verifiable results, both environmental and economic. These results depend on taking a systems approach, where governments assess the full life cycle of the municipal service and focus on reducing pollution and waste at the source.

15. Recycling in Ontario

The term recycling refers to the processing of materials so that the basic raw material may be used again, e.g. to recycle aluminum cans to obtain the metal for reuse. The recycling process is a fundamental tool in reducing the amount of waste that goes to landfill. This reduction is achieved by implementing and providing recycling programs that are reinforced through public policy and service delivery.

The traditional “blue box” was introduced in 1988 and has grown substantially over the years. Today the blue box is almost as common as the traditional garbage bag.

The following information was extracted from the Recycling Council of Ontario’s 2000 Fact Sheet.

The year 2000 was a record breaking year for Ontario Municipalities. Overall annual diversion increased by 3% to a total of 1.248 million tonnes diverted from landfill. Further, in 2000 the number of households having access to recycling programs increased by 84,000. The following are some additional highlights reported by the Recycling Council of Ontario:

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- The amount of Household Hazardous Waste (HHW) recovered as increased by 14%, to just under 9,000 tonnes
- Access to HHW programs increased by 4%, up to 10.36 million persons
- Centralized composting tonnage increased by 8%, to 304,000 tonnes
- Residential plastic tonnage increased by 7%, to 23,800 tonnes
- Residential paper tonnage increased by 3%, to 507,200 tonnes

The figure on the right shows there has been a 41% increase in the amount of recovered recyclable materials from 1992 to 2000.

The figure titled “2000 Materials Recycled” shows the provincial breakdown of materials by category from 1996 to 2000. Historically, paper has been the most significant proportion of the recycling program followed by glass, metal and plastic.

The table below shows the material recovery rates for municipal recycling programs in Ontario during 2000.

- 45% of recycling programs offer curbside collection, representing 73% of all households with access to recycling.
- 4% of all households recycle through a depot program, which accounts for 33% of recycling programs in Ontario.
- Residential curbside programs recovered 69 kgs/hhld more than depot programs, and 5kgs/hhld more than a combined curbside and depot program
- This table indicates that by expanding service, or making it more convenient for residents by offering curbside collection the recovery rate increases.

15.1 Serving the Multi-Residential Sector

Curbside collection of recyclables is now available to over 95% of the province's single family households. Approximately 60% of Ontario's population live in single-family households and are thus well served. However the remaining 40% of Ontario's population live in multi-family buildings where the number of households receiving recycling service, the form of service, participation and material capture rates, program costs and revenues remains uncertain.

While many view the multi-residential sector as a challenge to achieve the 50% diversion target set by the province of Ontario, other municipalities view this sector as a great opportunity to increase diversion substantially.

15.2 Regulatory Context for Multi-Unit Recycling

In April 1992 Bill 143 became law which outlined various regulations affecting municipalities, industrial, commercial and institutional generators to undertake a series of waste reduction and diversion activities. These regulations formally recognized reduction and diversion as key waste management methods.

In 1993, Regulation 101, implemented under Bill 143, required municipalities with a population of 5,000 to implement curbside recycling and backyard composting programs. Cities with populations larger than 50,000, were required to compost their leaf and yard wastes. Businesses and institutions meeting certain criteria were required to conduct waste audits and establish recycling programs.

In 1994, Regulation 103, also implemented under Bill 143, required those responsible for buildings with six units or more in municipalities with a population of 5,000 or more to implement a source separation program for recycling materials. Specifically, regulation 103 specifies that multi-unit buildings must recover the following materials for recycling.

- Aluminum food or beverage cans
- Glass bottles and jars for food or beverages
- Newsprint
- Polyethylene terephthalate bottles for food or beverages
- Steel food or beverage cans; and
- Any other categories of waste that are collected or accepted by the recycling program of the municipality where the building is located.

Although recycling is mandatory in the Province of Ontario very few municipalities are actively enforcing it.

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¹The number of municipalities who have implemented recycling programs and are achieving results vary significantly. Some of the reasons for the differing results include:

Residents in multi-unit buildings are typically required to deliver their source separated recyclable materials to central storage areas, rather than receiving ‘door-to-door’ collection similar to single family households

Residents who are asked to take their recyclable materials to the curb for collection must negotiate stairs and/or elevators with their storage container(s) and then retrieve this container from amongst their neighbours’ containers following collection

In many multi-unit buildings, residents may take their waste to a garbage room or chute on each floor while they are asked to take their recyclable materials to a storage area on the ground floor, in basements or in outdoor sheds, making the waste system more convenient than the recycling system for residents

Some multi-unit residences may have less storage area per capita than single family residences, creating storage problems for recyclable containers such as Blue Boxes

Older buildings were not designed to accommodate management of source separated materials and storage space is limited or unavailable

Co-operation of owner, superintendent or property manager is required.

Generally, recycling programs serving residents of multi-unit buildings are less convenient than recycling programs serving single family households, creating a barrier to effective program participation. In addition, as residents of multi-unit buildings do not benefit from the visual reminder of blue boxes set out at their neighbours’ houses, social peer pressure has little effect on participation or capture rates.

According to the 2000 study completed by the RCO approximately 70% of the units in the study are serviced by private companies. Further, 50% of those municipalities surveyed felt they serve all multi-unit units within their service area.

According to data prepared by the WDO, each single family household in Ontario generates approximately 1,100 kg of waste each year, including about 365 kg of recyclable materials and 440 kg of organic materials. Each multi family household generates less, in the order of 635 kg of waste each year, including about 265 kg of recyclables and 230 kg of organic materials.

The quantity recovered by each single family household is approximately 220 kg per year, or a capture rate of 60% of available recyclable materials. In comparison, based on the results of the 2000 RCO survey, the quantity recovered by each multi-unit household is approximately 84 kg per year or about 30% of available recyclable materials.

15.3 Innovative Projects

The following is a summary of some innovative that were identified by the Recycling Council of Ontario in their August 2000 report.

¹ Assessment of Multi-Unit Recycling in Ontario, Recycling Council of Ontario, August 2000

Multi Chute systems – in high-rise multi-unit buildings, can have their present garbage chute system retrofitted to accommodate up to six different materials. Residents select one of a series of buttons on a control panel beside the chute door. Their selected button relocates a diverter or carousel at the bottom of the garbage chute to direct materials into a specified storage bin.

The first multiple chute system in Canada was installed in Toronto. Prior to the installation residents deposited recyclable materials into a 95 gallon roll-out carts located in a storage room on the first floor of the building. After the chute system was installed, residents could deliver garbage, papers and containers to the chute room on each floor of the building.

Residents had been diverting 78.3 kg per unit per year prior to the chute system and 130 kg per unit per year after the chute system.

Apartment Separation Systems – The Essex-Windsor Solid Waste Authority implemented a pilot project to monitor the effect of the distribution of blue bags to residents of multi-unit buildings on recovery rates. In a one-year span the recovery rates increased from 94.1 kg per unit per year to 102.3 kg per unit per year. The most significant finding was that contamination levels decreased by approximately 64%.

15.4 Regulatory Initiatives

On August 1, 2000, Toronto City Council approved “Requirements for City of Toronto Garbage and Recycling Collection at New Developments and Redevelopments”. This document requires that recycling systems in a development or redevelopment be designed to ensure that it is as convenient as the garbage collection system. For example, developers and property managers may opt to include chute recycling systems or recycling rooms on every floor in an apartment complex.

The City of Toronto has also proposed a Residential Solid Waste Collection By-law that if approved by Council will:

Require all new developments and redevelopments to adhere to the solid waste requirements during the site plan approval process to ensure that appropriate storage and collection systems are incorporated into the development.

Require owners of multiple household residences to provide sufficient containers for recyclable materials and yard waste; and

Allow the City to withdraw waste management services from a multiple household residence which does not participate fully in the City’s recycling program

16. Composting in Ontario

²Composting is Nature’s way of recycling. Composting decomposes and transforms organic material into a soil-like product called humus. Food scraps, leaves and yard trimmings, paper, wood, manures, and the remains of agricultural crops are excellent organic materials which can

² The Composting Council of Canada, www.compost.org/natural.html

be composted. ³It is estimated approximately 50% of the **total waste stream** could be composted.

16.1 Composting Systems

16.1.1 Backyard Composting

Backyard composting refers the setting up and ongoing management of a composting unit at home.

The number of compost bins distributed by Ontario municipalities to date is 1.145 million. Based on municipal composting participation studies, it is estimated that residential participation rates continue to remain high (half of the studies reported on ongoing participation rate of 75% or greater)

Year	1994	1996	1997	1998	1999	2000	%Change
No. of municipalities providing units	449	481	427	419	393	380	(3)
Per cent of provincial population in these municipalities	96	98	97	98	98	98	0
Households provided with compost bins (000's)	900	1,000	1,050	1,110	1,120	1,145	2
Kilograms per unit diverted*	100	100	100	100	100	100	N/a
Approximate tonnes diverted (000's)	90	100	105	111	112	115	2

*Estimated to 100 kilograms per unit to more accurately reflect tonnage diverted by this activity

16.1.2 Centralized composting

Centralized composting involves the collection and transportation of large amounts of organic materials to a special facility where it is prepared and processed into compost. Centralized composting can refer to the processing of leaf and yard waste materials or a combined composting system that handled household organics in addition to the leaf and yard waste materials.

Centralized composting programs processed 304,000 tonnes of organic material from Ontario Municipalities in 2000. This represents an 8% increase from the previous year. Almost 90% of Ontario's households have access to centralized composting services.

Leaf and yard materials in addition to grass clippings and Christmas trees constitute the principle sources of organic feedstocks. Nine municipal composting programs also collected approximately 13,800 tonnes of food materials at curbside (5% of the total feedstock).

Generally in-house staff are primarily responsible for compost product sales and marketing (31 programs) while eight municipal programs are utilizing an outside broker for compost distribution and sales. Two municipal programs are directly producing custom blends of finished compost products.

³ The Composting Council of Canada, www.compost.org/natural.html

Residential use is the primary end-market followed by municipal public works departments, landscapers, topsoil blenders, and landfill cover. Landscaping, horticulture, agriculture and land reclamation continue to represent high potential markets for finished products.

16.1.3 On-Site Composting

On-Site Composting refers to the on-site management of organic waste generated by a group of people, such as in an apartment complex, office building or hospital. On-site composting avoids the costs associated with the transportation of organics. As with other systems, the establishment of efficient and effective collection as well as the maintenance of the composter is important to ensure that the process runs effectively.

16.2 Changes in Composting Activity

Year	1994	1996	1997	1998	1999	2000	%Change
No. of programs	30	32	67	74	77	84	9
No. of municipalities ¹	152	150	241	235	217	199	(8)
Households w/access to service (000's)	3,070	3,323	3,560	3,746	3,874	3,944	2
Tonnes processed (000's)	149	219	280	290 ²	281 ³	304	8

¹The decline since 1997 is the result of municipal amalgamations

²Unusually high tonnage reflects material resulting from 1998 ice storm

³There are 13 small programs which did not report tonnes. These programs represent approximately 70,000 households with access to central composting. Twenty-three thousand tonnes have been estimated for these programs and included in the total of 281,000 tonnes.

The table above shows a steady increase in the number of composting programs in Ontario municipalities and significant impact this has had on diversion. From 1994 to 2000 the number of tonnes processed as more than doubled from 149 tonnes in 1994 to 304 tonnes in 2000.

17. Industry Trends

17.1 Pay as you throw

The idea of Pay as You Throw or “unit pricing” has been around for a long time. Individuals are faced with it in many activities in their daily lives. People buy, gasoline by the gallon, water per cubic meter, electricity per kilowatt-hour plus many more examples. The first step in setting up an effective Pay as You Throw program is your ability to promote, or receive buy in from the residents of the community.

Municipal solid waste has traditionally been funded through taxes or flat rate billing. This pricing model provides the same incentives as the all-you-can-eat buffet. It is this model along with lagging legislation that has helped contribute to what some are calling a national solid waste crisis, exemplified by disappearing landfill capacity, rising disposal costs, limited use of recycling programs and the attitude that unlimited waste service is right.

However, times are changing. Many municipalities have taken the lead by implementing aggressive waste diversion programs which use pay as you throw as a cornerstone of their success. The Municipal Act gives municipalities explicit authority to charge for waste collection on a per unit basis. As of 1998 over 70 municipalities have implemented pay as you throw programs and according to AMRC, this number is well over 100 today. In fact based on discussions with the AMRC it has become so clear that pay as you throw is the most effective

tool to increase diversion they don't even bother tracking it anymore. Instead they focus their resources on helping communities implement Pay as You Throw programs.

17.1.1 Benefits of Pay as You Throw

The most important benefit to pay as you throw is it creates the connection between each customer's cost and disposal habits, and provides an incentive for customers to make smarter choices in how they handle their waste.

⁴All pay as you throw systems offer important advantages for both solid waste agencies and their customers:

Increased awareness of solid waste costs – Traditionally, the total cost of solid waste operational costs have been obscured from the resident by being lumped into one general tax bill that covers many public services. Pay as you throw makes residents aware of the cost of the waste services they use, and reinforces that awareness every time they buy a pre-paid garbage bag tag/sticker

Incentive to reduce waste – When residents have to pay more for each can or bag disposed, their decision of purchasing excessively packaged products at the store will likely be influenced. Further they are more likely to throw old lettuce into compost pile rather than the trash.

Incentive to recycle – If throwing away is more expensive because the true costs of disposal are accounted for, recycling becomes a more economically beneficial option. This financial incentive can help increase use of recycling programs, and can reduce total waste management system costs.

Reduced dependence on landfills or incinerators – Pay as you throw will reduce tonnage going to landfills or incinerators. Therefore, the need for expansion of landfills is postponed.

Stabilized system costs– Final disposal is often the unstable, and sometimes the most expensive, component of solid waste system cost. The incentives created by pay as you throw will reduce landfill costs can help stabilize system costs.

Equity among residents – Flat-rate billings and taxes make no distinction between high and low-level disposers. With pay as you throw residents are charged according to the amount of waste they dispose.

Help in meeting legislated diversion goals – Pay as you throw systems are fundamentally the most effective, efficient way to increase diversion. Most studies show when Pay as You Throw systems are implemented the diversion rate can increase by 40 to 70 percent in the first year alone.

In the past the primary driver behind municipalities implementing Pay as You Throw programs was the realization of their local landfill could not continue to support their communities waste habits. However, over the past several years Ontarians have become increasingly concerned about the environment forcing all levels of government to rethink policy decisions that will have an impact on the environment in the short and long term.

⁴ <http://www.ciwmb.ca.gov/wpw/unitpricing/default.htm>

Financial Benefits of Pay as You Throw

As waste quantities decline:

- ✓ Tipping fee expenditures decrease
- ✓ Collection costs may drop as routes can be covered more quickly
- ✓ Extended landfill life reduces hidden waste management costs; associated with landfill planning, siting, operation, closure and maintenance
- ✓ Residents and businesses can exert more direct control over their costs for collection and disposal of waste
- ✓ Reinforces the principle of “Polluter Pays” – the less waste that is generated, the less is paid

Environmental Benefits of Pay as You Throw

Less waste being generated means:

- ✓ More people are composting and returning valuable nutrients to the earth
- ✓ The capture rate of recycled items is increased, so fewer raw materials and less energy are required to supply our material needs
- ✓ Fewer new landfill sites are required
- ✓ Reusable and/or repairable items are more likely to be given to others or donated to charities rather than disposal

Political Benefits of Pay as You Throw

Waste management is a prominent public issue:

- ✓ The environment is one of the most important public policy issues in Canada today and efforts to protect it are more acceptable and better received than ever before
- ✓ The provincial government has set a target of at least 50% reduction of waste going to landfill. Each municipality needs to assess its contribution to this target

17.1.2 Pay as You Throw = Diversion

It is clear that when residents become financially responsible for the amount of waste they generate they become more conscious of limiting this amount. The following statistics were gathered from the 1998 Pay as You Throw Implementation Program compiled by the AMRC

Brockville – In the first week of June, 1996, Brockville changed from a 2 bag limit (additional bags \$1.50/bag) to 1 bag limit (additional bags \$1.25/bag). As a result, Brockville reported a 26% drop in tonnage after the **first** week of the new bag limit.

Gananoque – The program was implemented in June, 1991 with no free bags. In the first year of the program the generated an average of 18.95 tonnes of residential waste per week, compared to 31.87 tonnes a week prior to the start of the program. Between 1994 and 1995 there was an 9.4% increase in recyclables captured – a total of 324.33 tonnes – and there was also a 6.7% decrease in waste tonnage.

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Village of Grand Bend – The program was implemented in October, 1992 with no free bags. 1989 – 1050 tonnes; 1991 – 980 tonnes; 1992 – 480 tonnes; 1993 – 500 tonnes; 1994 – 380 tonnes; 1995 – 342 tonnes. This represents a 67% decrease in tonnage in 7 years.

Town of Prescott – The program was implemented in August, 1992 with two free tags. Between 1992 and 1996, the town incrementally reduced the number of free tags. As of January, 1996 there were no free trash tags. 1990 – 1,475 tonnes; 1991 – 1,395 tonnes; 1992 – 1,162 tonnes; 1993 – 1,040 tonnes; 1994 – 998 tonnes; 1995 – 912 tonnes. This represents a 38% decrease in tonnage in 6 years.

City of Trenton – the program was implemented on February 15, 1996 with no free bags. Figures are based on the period from mid-February to the end of June, comparing 1995 and 1996. 1995 – 1,231.19 tonnes of waste; 1996 – 496.46 tonnes of waste. This represents a 40% reduction in total tonnages for this 20-week period.

Loyalist Township - implemented Pay As You Throw in 2002 - a decrease in garbage of 46% and an increase in recycling of 3% was reported for the first quarter. This could be due to the multi-residential and IC&I sector moving from municipal to private collection.

Consideration must be given to the fact that these percentages are not pure. Implementing Pay as You Throw may cause the generators to switch service providers, thereby reducing overall tonnage.

18. Blue Bag

During our research we became aware of an increasing trend of municipalities moving from their Blue Box program to a Blue Bag Program. Through speaking with the Recycling Council of Ontario we were put in contact with David J. Douglas, Manager of Environment Waste Programs for Clorox Canada, parent company of Glad Canada.

According to Clorox Canada, 1.8 million Canadian households now incorporate their GLAD “See Through” Blue Bag into their recycling habits. The jurisdictions currently using their Blue Bags include the Province of Nova Scotia, Province of P.E.I., Westmorland-Albert, (Moncton) New Brunswick, Guelph / London / Niagara / Northumberland – Ontario, Edmonton, Alberta and the Okanagan, British Columbia.

In a report issued by Proctor & Redfern Limited based on a 12 month study in the Town of Markham showed the Blue Bag provided many benefits over the Blue Box for both the resident and the municipality. Some of the highlights include:

- The number of people who prefer the Blue Bag system outnumber those who prefer the Blue Box system by a factor of nearly 3:1
- The recovery rate for materials collected in the pilot project using the Blue Bag system was 45% higher than the blue box system after the first six months
- The Blue Bag system of recycling wins over the Blue Box on 14 of 15 attributes used to compare the two systems.

The study participation and diversion was conducted by using two separate distinct areas, one using a blue boxes and one using blue bags. The public perception was determined through a telephone interview conducted by Decima Research, an independent market research company.

18.1 Recovery Rates

The recyclable materials were separated into 7 categories with the Blue Bag achieving high recovery rates in all categories. The results indicate that over a 12-month period each household would divert approximately 324 kg of material using the Bag program compared to 225 kg using the Box program.

18.2 Public Perception

Decima Research gauged public opinion under 15 categories. On a side-by-side comparative evaluation, the Blue Bag system “wins” versus the Blue Box on 14 of 15 attributes measured. Further support was received for the Blue Bag in Northumberland County where 69.4% of residents chose the Blue Bag as their favourite method for sorting recyclables.

The use of Blue Bags can be used as part of a Wet-Dry program or separately as a method to collect dry recyclables.

19. Wet-Dry Programs

Our research included interviews with public and private industry professionals. Through these interviews we gained a better understanding of the complexities and challenges of implementing a Wet-Dry system. While very few municipalities have a complete Wet-Dry system there are many that are offering partial systems or are gradually moving to a more complete system.

Included in Appendix A is a report titled “Canadian Wet-Dry Programs” which details some of the leading municipalities in Canada in the Solid Waste Industry.

We must also indicate that while we have only identified Wet-Dry programs there are additional leading technologies being explored today as alternative Solid Waste strategies. These include SUBBOR, Incineration, Gassification and Plasma Arc. However, these technologies are still being explored and researched and there is a general lack of data to support the costs and effectiveness of these alternatives.

19.1 The Streams of Solid Waste

Often you will hear of Wet-Dry systems referred to as a “two stream system” or a “three stream system”. Solid Waste is comprised of the following three streams:

Stream 1 – dry recyclable materials

Stream 2 – dry material that will go to landfill

Stream 3 – Compostable materials

A two-stream system combines Streams 1 and 2. The material is then sorted at the MRF through a combination of automated and manual sorting procedures.

A three-stream system requires the resident to separate dry recyclables and dry garbage similar to the Blue Box Program.

Under both systems compostable materials are placed in bags or carts at curbside.

Most municipalities who have implemented Wet-Dry programs are operating a two-stream system. Our research including reports and conversations indicates that a two-stream system achieves higher diversion rates than the three-stream system. The two-stream system captures all dry materials and sorts the materials at the MRF, leaving no room for error at the citizens' residence. Under the three-stream system recyclables and compostables can still slip through in the traditional "black bag". The other key advantage of the two-stream system is the reduction of public education required as compared to the three-stream system.

19.2 Co-Collection Systems

Through the use of split trucks and a two stream system, crews are able to collect recyclables, compostables and traditional garbage in one pass. This provides operational efficiencies and improves service delivery by simplifying scheduling for residents.

19.3 Implementing a Wet-Dry Program

Implementing a Wet-Dry program requires significant capital investment. This includes the purchasing or retrofitting of collection vehicles and the building or retrofitting of Material Recovery Facilities and composting facilities. There have been varying approaches in implementing systems from a complete transition to more of modular implementation. Due to the significant cost and time frame required to make the transition reserve funds can be established to spread the cost over a longer-term.

On the other hand a municipality could implement a Bag Collection system and through a contractual arrangement with another Wet-Dry operation and pay to have their waste transported and disposed. A thorough financial analysis would have to be completed to weigh the short and long-term implications of either approach.

19.4 Green Bags

Similar to the Blue Bag many municipalities have started collecting curbside compostables using Green Bags. "See Through" Green Bags are in use in Guelph, Westmorland-Albert and Dufferin County.

20. Serving the ICI sector

The Industrial, Commercial and Institutional sector continues to provide challenges for municipalities as they strive to achieve the 50% diversion target. The service delivery varies greatly from municipality to municipality and is largely tailored to meet the specific needs of each City. Based on our research some of the municipalities that are implementing successful diversion programs for the ICI sector are doing so through a Wet-Dry program or some form of bag collection that reduces the common problems associated with the Blue Box.

21. Funding Models

Although we did contact every municipality but all the municipality, of the ones we did speak to they apply a general tax levy or flat fee to all property classes for Solid Waste funding. Additional funds are derived from a variety of sources depending on the municipality including a flat rate applied to residential households and funds from the sale of bag tags. No municipality offered a rebate program similar to that offered by the City of Kingston.

22. Promotion & Education

One of the key elements to a successful Solid Waste Program is an effective Promotion and Education (P&E) program. However, in order for this to be successful it must be under the direction of a strategic Solid Waste Plan with clearly defined objectives that can be measured and continually modified to improve the overall program. Further, this is an ongoing challenge to educate new residents and continually remind existing residents of the details of the program. The P&E component included print, radio, television, outdoor, transit, seminars and videos. All of the municipalities contacted had a minimum of 1 full time staff member dedicated to promotion and education. The human and financial resources are greater at the beginning of a program and can be scaled back after the program is more mature.