

National Survey to Identify Municipal Best Practices Regarding the Recovery of Residential Scrap Metal

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Table of Contents

1.0 Executive Summary	1
2.0 Introduction	2
3.0 Background	2
4.0 Survey Results	3
4.1 Waste composition/audit studies	3
4.2 Municipal scrap metal programs	4
4.3 Curbside programs	5
4.3.1 Sorting and Processing	6
4.4 Municipal drop off depots	7
4.4.1 Sorting and Processing	9
4.5 Scrap Metal recovery and Extraction	10
4.6 Non-municipal collection – scrap yards	10
4.7 Quantities	11
4.7.1 Generation vs Waste Composition Data	11
4.8 Program Costs/Revenues	13
4.8.1 Program Costs	13
4.8.2 Program Revenues	14
5.0 Best Practices and Case Studies	15
5.1 Case Studies	15
5.1.1. City of Toronto	15
5.1.2 City of Guelph	16
5.1.3 Region of Durham	17
5.1.4 Town of Markham	17
5.1.5 Township of McNab-Braeside	17
5.1.6 City of Owen Sound	17
5.1.7 Township of Tay	17
5.1.8 City of London	17
5.1.9 City of Orillia	17
5.1.10 County of Simcoe	18
5.1.11 City of Edmonton	18
5.1.12 City of Montreal	18
5.1.13 Town of Cochrane, AB	18
5.1.14 Prince Edward Island	18
5.1.15 Hornby Island, BC	19
5.1.16 St. John’s NF	19
5.2 What are the Best Practices?	20
5.2.1 Adding to an Existing White Goods Drop-off Program	20
5.2.2 Call for Service, Based on the User Pay Principle	20
5.2.3 Adding to a White Goods Collection Program	20
5.2.4 Radioing for a Dedicated Scrap Metal Pick-up as Needed	20
5.2.5 Adding to an Existing Recycling Collection Program	20
5.2.6 A Special Scrap Metal Pick-up	20
5.2.7 Enhanced Promotion	21
5.2.8 Financial Incentives	21
5.2.8.1 Paying for Scrap Metal	21
5.2.8.2 User Pay Waste Collection	21
5.2.8.3 Tipping Fees that Favour Source Separation	21

Table of Contents (continued)

5.2.9 Enhancement of Reuse Activities	21
5.2.10 Making the Most of Opportunities to Reduce Hazards	22
6.0 Conclusion	23
7.0 Next Steps	25
Appendix	25
Tables	
Table 4.1 Waste Audit Summaries	3
Table 4.2.1 Scrap Metal Collection Programs	4
Table 4.2.2 Proportion of Programs Collecting Scrap Metal Items	5
Table 4.3 Curbside Collection Programs	5
Table 4.4 Depot Collection Programs	6
Table 4.7 Scrap Metal Tonnages	11
Table 4.8.2 Revenues	14

1.0 EXECUTIVE SUMMARY

The Association of Municipal Recycling Coordinators (AMRC), on behalf of the Enhanced Recycling program of the *Government of Canada Action Plan 2000 on Climate Change* completed a survey of 32 large Canadian municipalities (population >100,000) in February and March, 2004 to determine current practices with respect to the collection and recycling of residential-source scrap metal. The purpose of the survey was to (1) identify case studies or best practices that can be adopted by municipalities looking to improve on existing programs and recovery rates, and (2) to identify municipalities that are not doing anything in this area, where improvement needs to take place.

The *Government of Canada Action Plan 2000 on Climate Change* Minerals and Metals Program is working towards the reduction of Canada's greenhouse gas (GHG) emissions by enhancing mineral and metal recycling processes and practices, and by assessing alternate production processes with focus in those industrial sectors with high GHG-emitting activities.

All but one of the 32 survey respondents indicated that there is some level of municipal involvement in either collecting or consolidating scrap metal from residents. This ranges from curbside collection (15 programs), to operating depots or drop off areas for residents to deliver scrap materials (31 programs). Of the 15 curbside collection programs, the majority limit collection to large appliances. Of the 31 municipal scrap metal programs, 16 collect scrap metals exclusively at drop off depots.

Of the programs that reported tonnage, few were able to provide numbers for the different scrap metal categories, or for ferrous vs. non-ferrous quantities. For those that did provide a ferrous/non-ferrous split, the percentage of non ferrous to total metal ranged from 1.7 to 11%. In a number of cases, tonnage for only a portion of the program (e.g., depots) or a portion of the year were reported. The calculated per household generation rate ranged from 5.6 to 35.5 kilograms.

Program costs were not well characterised. Reported revenues ranged from for mixed metals (ferrous and non-ferrous) showed a significant range, from a low of \$2.51/tonne (picked up by contractor) to \$90.00/tonne.

Waste composition data (present survey and

Waste Diversion Ontario data) indicate that per household scrap metal ranges from one to 44.3 kilograms per year.

Case studies of a number of surveyed and other municipalities identified a range of best practices, which, if used to supplement or augment existing programs could lead to increased scrap metal recovery.

The survey and follow-up research suggest that residents in Canada's large municipalities generally have good access to programs for managing their used appliances, but there is little emphasis on the sources of smaller scrap metal items.

The promotion and enhancement of existing programs would likely be the most cost-effective first step to increasing recovery of scrap metal. In addition, a series of fact sheets highlighting the different approaches taken by municipalities to enhance recovery of scrap metal - as identified in this report - could be made available through such organisations as the Federation of Canadian Municipalities, and provincial municipal and waste diversion associations.

Acknowledgements

The AMRC gratefully acknowledges the assistance of municipal staff who responded to the survey and took the time to answer our numerous follow up questions. We also appreciate the efforts of all those who shared their promotional and educational materials with us.

2.0 INTRODUCTION

The AMRC completed a survey of large Canadian municipalities (population >100,000) in February and March 2004 to determine current practices with respect to the collection and recycling of residential-source scrap metal. The survey was undertaken under contract to the Minerals and Metals Sector at Natural Resources Canada.

Using the results of the survey, the purpose of this report is:

- to identify case studies or best practices that can be adopted by municipalities looking to improve on existing programs and recovery rates, and
- to identify municipalities that are not doing anything in this area, where improvement needs to take place.

2.1 Municipalities contacted

The municipalities that received surveys were:

- Abbotsford, City (BC)
- Barrie, City (ON)
- Calgary, City (ON)
- Cape Breton Regional Municipality (NS)
- Chatham-Kent, Municipality (ON)
- Chicoutami-Jonquière, region
- Edmonton, City (AB)
- Greater Sudbury, Municipality (ON)
- Guelph, City (ON)
- Halifax Regional Municipality (NS)
- Hamilton, City (ON)
- Kelowna, City (BC)
- Kingston, City (ON)
- Kitchener, City (Waterloo) (ON)
- Laval, ville (QC)
- London, City (ON)
- Longueuil, ville (QC)
- Moncton, City (NB)
- Montréal, City (QC)
- Oshawa, City (ON)
- Ottawa, City (ON)
- Peterborough, City (ON)
- Québec, City (QC)
- Regina, City (SK)
- Saskatoon, City (SK)
- Sherbrooke, ville (QC)
- St. Catharine's (Regional Municipality of Niagara) (ON)
- St. John's, City (NF)
- Saint John, City (NB)
- Thunder Bay, City (ON)
- Toronto, City (ON)

- Trois Rivières, ville (QC)
- Vancouver, City (BC)
- Victoria, City: Capital Regional District (BC)
- Windsor, City (ON)
- Winnipeg, City (MB)

Responses were received from all but four (Cape Breton Regional Municipality, Chicoutami-Jonquière, Moncton and Sherbrooke). However, two additional municipalities with populations over 100,000: Laval and Longueuil, were contacted and responded to the survey.

In addition, eight other communities were contacted to determine what approaches they have taken to handling scrap metal. These municipalities were: Markham (ON), McNab-Braeside (ON), Owen Sound (ON), Tay Township (ON), Prince Edward Island, Hornby Island (BC), Simcoe County (ON) and Cochrane (AB).

Survey results are summarised in Section 4, and fully detailed in the *Excel* file submitted with this report: *Scrap metal survey—Summary of all results, March 16, 2004.xls*. Section 5 documents case studies and best practices, and Section 6 features some conclusions and outlines some potential next steps.

A copy of the survey can be found in Appendix 1.

3.0 BACKGROUND

Residential-source scrap metal comprises a wide range of household items, including:

- Large appliances (white goods)
- Small appliances (toasters, kettles, humidifiers, etc.)
- Containers and utensils (pots, pans, tools),
- Fittings and fixtures (sinks, tubs, ventilation, plumbing, etc.),
- Furniture/brown goods (bed frames, mattresses, sofa beds, etc.),
- Outdoor items and sports equipment (bicycles, barbecues, exercise equipment, etc.),
- Tools and hardware (nails, screws, ladders, etc.),
- Electronics (computers, VCRs, cell phones, etc.),
- Miscellaneous (hangers, decorations, toys, etc.)

4.0 SURVEY RESULTS

The survey was emailed or faxed to 35 municipalities during the week of February 9th. Subsequently, each municipality was contacted to verify receipt of the survey and/or to clarify responses to some of the survey questions

Responses were received from 31 municipalities, and the results are summarized in sections 4.1 to 4.8. Note that the full results are in Appendix A,, separate *Excel* file submitted with this report.

4.1 Waste composition/audit studies

Fourteen municipalities indicated that they had carried out either waste composition studies or waste audits within the past three years. Table 4.1 summarises their results.

Scrap metal amounts per household appear at first glance to be quite variable, but it should be noted that the audits or composition studies were measuring different things. For example, some have included white goods, some have limited the studies strictly to contents of garbage bags.

The overall range of scrap metal reported by the survey respondents was one kilogram per household per year to 27 kg per household per year, and 7.8 to 27 kg per capita per year.

A review of waste composition studies undertaken under the auspices of Waste Diversion Ontario (WDO) in 2001 shows the same variety in result for scrap metal as did the information provided by the survey respondents. An analysis of 20 such studies showed the per household yearly generation of "other metal" as ranging from 1.6 to 44.3 kilograms.

By its very nature, the generation of scrap metal in the household and its ultimate disposal do not follow the same patterns as what might be termed "everyday garbage". Any waste composition study which confines itself, therefore, to the examination of the bags placed on the curb for regular garbage collection will not necessarily reflect the amount of scrap metal generated in a given household.

Items such as old lawn chairs, small appliances, hangers etc., do not readily fit the constraints of the average garbage bag and may well linger in a corner of the garage or basement until a trip to the landfill or ReStore is contemplated by the household. While there are some municipalities who will collect such items if left on the curb with the regular garbage, others will only collect bagged waste. Items that do not fit into garbage bags would be subject to a special waste collection and/or residents are advised to take them to the local

Table 4.1 Waste Audit Summaries

Municipality	Date/Scope	kg/capita or hhld/year	Ferrous	Non-ferrous	Other	Notes
Abbotsford, City	July 2003; 200 hhlds in sample	19.64 kg/hhld/yr				For all residential metal collected curbside; does not include white goods.
Calgary, City	1999	7.8/kg/cap/year	3.8	1.3	2.7	Does not include white goods
Edmonton, City	June - August, 2000; 5 waste sorts	22.9 kg/hhld	18.5			Does not include white goods
Guelph, City	2000	24.5 kg/cap/year	17.7	6.8		Does not include white goods
Halifax Regional Municipality	2003	27 kg/cap/year				Includes white goods
London, City	2002	2.9% of total waste				Does not include white goods
Oshawa, City	May/June, 2003	9.6 kg/hhld/year				Does not include white goods. Audit completed by Durham Region
Ottawa, City	Winter, 2003	1 kg/hhld/yr				
Peterborough, City	August, 2000	3.93 kg/hhld/year				Does not include white goods
Saskatoon, City	Planning one for 2004					
St. Catharine's (Niagara)	2000/2001	7-10 kg/hhld/year				Does not include white goods or large items
Toronto, City	April 22-May 16, 2003	10.36 kg/hhld/year				80 SFD in Etobicoke (Green bin area); Does not include white goods
Victoria, City: Capital Regional District	October, 2001	15.82 kg/cap/year	12.89	2.93		Does not include white goods
Windsor, City	May, 2003	5.46 kg/hhld/year (baseline); May, 2003				Does not include white goods, Audit completed by ESWA
Winnipeg, City	1998	9.9 kg/cap/year	7.4	2.5		

landfill or transfer station for disposal or recycling.

Another aspect of scrap metal items is that they are not necessarily seen as garbage and may be stored for eventual repair or because they may be useful to a “handyman” one day. (Ultimately, a lot of these items do end up in the junk pile and are mixed with other materials when the trip to the landfill finally happens). It is, perhaps, at the landfill

(or the transfer station/drop-off depot) where there is the best opportunity to recover these materials and divert them from disposal.

4.2 Municipal scrap metal programs

All but one of the 32 survey respondents indicated that there is some level of municipal involvement in either collecting or consolidating scrap metal from residents. This ranges from curbside collection (15 programs), carried out by the municipality (or contractors/agencies working for the municipality), to

Table 4.2.1 Scrap metal collection programs

Municipality	Curbside	Depot	Large appliances	Small appliances	Electronics	Other items	Brown goods
Abbotsford, City ¹		Y	Y	Y if working	Y if working	Y if reusable	N
Barrie, City ²	Y	Y	Y	Y	Y	Y	
Calgary, City		Y	Y	Y	Y at "round ups"	Y	N
Chatham-Kent		Y	Y	Y	N	Y	N
Edmonton, City		Y	Y	Y	Y	Y	Y
Greater Sudbury ³	Y	Y	Y	Y	Y	Y	Y
Guelph, City ⁴	Y	Y	Y	Y	Y	Y	N
Halifax Regional Municipality	Y	N	Y	N	N	Y	N
Hamilton, City		Y	Y	Y	N	Y	N
Kelowna, City		Y	Y	Y	N	Y	N
Kingston, City		Y	Y	N	N	Y	Y
Kitchener (Waterloo)	Y	Y	Y	N	N	Y	N
Laval, ville		Y				C&D only	
Longueuil, ville		Y	Y	N	N	Y	Y
Montreal, City	Y	Y	Y	Y	Y	Y	Y
Oshawa, City ⁵	Y	Y (by Region)	Y	Y	Y	Y	N
Ottawa, City ⁶	Y	Y	Y	Y	N	Y	N
Peterborough, City	Y	Y	Y	Y	Y	Y	N
Quebec, City ⁷	Y	Y	Y	Y	N	Y	Y (landfill)
Regina, City		Y	Y	N	N	Y	N
Saskatoon, City		Y	Y	Y		Y	Y
St. Catharine's ⁹	Y	Y	Y	N	N	Y	N
St. John's ¹⁰	Y	Y	Y	Y	N	Y	Y
Saint John		Y	Y	Y	Y	Y	Y
Thunder Bay, City		Y	Y	Y	Y	Y	N
Toronto, City ¹¹	Y	Y	Y	N	Y	Y	N
Trois Rivières ¹²	Y	Y	Y	Y	N	Y	N
Vancouver, City ¹³		Y	Y	Y	N	Y	Y
Victoria, City: Capital Regional District		Y	Y	Y	N	Y	N
Windsor, City ¹⁴	Y	Y	Y	Y	N	Y	Y
Winnipeg, City		Y	Y	Y	N	Y	Y

1 Abbotsford has partnership with Abbotsford-Mission Recycling Depot that salvages small appliances and other reusable items for resale.

2 Barrie has partnership with Habitat for Humanity/ReStore that picks up bulk items at residents' request.

3 Greater Sudbury: Curbside collection only for large appliances.

4 Guelph: Electronics and other and brown goods depot collection only.

5 Oshawa: Brown goods depot collection only.

6 Ottawa: Large appliances only collected curbside at call in by resident

7. Quebec City: Small appliances and electronics only at depot

8. Peterborough: TVs only small appliances at curbside.

9. St Catharines: Curbside collection for large appliances only.

10. St. John's: Curbside for large appliances, TVs and items such as bikes only.

11. Toronto: Collection of electronics only at depot, curbside of small appliances only in pilot, brown goods: sofa beds only.

12. Trois Rivières—Small appliances and “other” depot collection only.

13. Vancouver: only VCRs are collected (for metal) and mattresses only for brown goods.

14. Windsor: Brown goods collected only at depot.

operating depots or drop-off areas for residents that accept scrap materials (31 programs).

Table 4.2.2 Proportion of programs collecting scrap metal items

Item	Number of programs that collect	Percentage of programs that collect	Notes
Large appliances	30	97	
Small appliances	23	74	1 program for reuse only
Electronics	12	39	1 program for reuse only
Other metal items	31	100	1 program is C&D only
Brown goods	13	42	1 program for disposal only

The City of London is the one exception to this, having banned appliances and scrap metal from its landfill. Residents make their own arrangements

with collection contractors and scrap yards. The city provides lists of scrap yards/dealers for residents.

Table 4.2.1 on the previous page outlines collection programs and materials collected.

Large appliances are collected by all but one program, with the remaining items being variable, as outlined in Table 4.2.2

4.3 Curbside Collection Programs

Of the 15 curbside collection programs, the majority limit collection to large appliances. Only six collect small appliances at the curb, three collect some types of electronics, nine collect other scrap metal items and four collect brown goods. Three noted that they specifically exclude car parts, and one noted that they exclude propane and other pressurized tanks (although it is likely that most other programs leave these behind as well). Note that all but one (Halifax) of the municipalities with curbside programs also operate drop off depots.

Table 4.3 Curbside collection programs

Municipality	Collection Method	Fee/amount	Scavenging encouraged?	How?	Material sorted or compacted before shipment?	Mercury Switches Removed?
Barrie, City	Habitat for Humanity picks up at resident's request	\$25/pickup	NO		N	No
Greater Sudbury	Items placed at curb are picked up within 5 days of regular collection		No		baled	No
Guelph, City	Call for service	\$15 for first item; \$10 for second	Yes	Goods Exchange Day, once/year	Yes	Yes
Halifax Regional Municipality	Collected with regular garbage and sorted at front end processor	No	No		Sorted at front end processor and compacted	No
Kitchener (Waterloo)	Call for service	No	No		No	Yes
Montreal, City	Call for service, special collections, some collected with regular garbage and disposed	No	Yes	By operating the Eco-centre	Yes	No
Oshawa, City	Call for service		No			No
Ottawa, City	Call for service	Yes	No		No	No
Peterborough, City	Four pick ups per year	\$15 for first item; \$5 for additional	Yes	Reusables Exchange weekends, 2-3 times/yr	No	Yes
Quebec, City	Call for service	N	Not encouraged, but tolerated		No	No
St. Catharine's (Niagara)	Call for service	\$20/unit for CFC items, other nc	No			Yes
St. John's	By appointment, 3 times per year	N				No
Toronto, City	Call for service	N	No		Sorted only for refrigerant, then compact with backhoe	No
Trois Rivieres	Collected on regular garbage days	N	No		No	No
Windsor, City	Bi-weekly collection service	N	NO		Yes	No

The majority operate on a call for service basis. The City of Barrie has a partnership with Habitat for Humanity: when requests for pickup are received at the city, the information is faxed to Habitat who then make arrangements with the resident, charging a pickup fee of \$25.00.

Interestingly, only four programs charge a direct fee for pickup, which ranges from \$5.00-\$25.00.

“Organised scavenging” for any items left at the curb is actively encouraged by two municipalities (Guelph and Peterborough) that promote regular goods exchange days. Montreal’s Eco-Centres also provide an opportunity for reuse. The remaining programs do not promote such activities—many have had significant problems with loss of value items from blue boxes when metal and other commodities prices are high, and this issue would extend to higher value scrap metal items such as cast aluminum barbeques and other aluminum items.

4.3.1 Sorting and Processing

With respect to processing before shipment, Ontario municipalities are required by provincial law to remove refrigerant. Of these, two municipalities indicate that they compact or bale appliances once the refrigerant is removed. In addition, four Ontario programs, two Saskatchewan and one Alberta program also remove mercury switches from chest freezers prior to shipment.

4.4 Municipal drop off depots

Of the 31 municipal scrap metal programs, 16 collect scrap metals exclusively at drop off depots.

The number of depots varies widely, and seems to be more a function of the area served by the municipality, rather than the total population. For ex-

ample, Chatham-Kent, Kitchener (Waterloo) and St. Catharines (Niagara) operate eight, six and six depots respectively, but all have a significantly larger service areas than do many of the urban programs. Table 4.4, *Depot Collection Programs*, details the number, location, fees and processing at the depots. Programs marked with (D) are depot collection only.

Table 4.4 Depot collection programs

Municipality	Number of depots	Location	Fee/Amount	Exclusions?	Why?	Material sorted or compacted	Mercury Switches Removed?
Abbotsford, City (D)	One transfer station, one depot, and one salvage depot	City property	N, except for passenger tires with rims (\$3.00)	N		Depot: hand sorted; Transfer: has separate areas for items	No
Barrie, City	One depot	City landfill	After four dropoffs/year, cost is \$5/drop off under 400 kg.	N, but all must be certified CFC- free	CFC regulations	N	No
Calgary, City (D)	Three	Landfills	\$38/tonne	N		N	Yes
Chatham-Kent (D)	Eight	Public works and other mun. property	\$20 per refrigerant-containing units	N		Yes, at 5 of the 8 sites	No
Edmonton, City (D)	Two	Eco-stations	Yes: \$42/tonne, min \$12, plus \$5 for CFC removal. Also \$3 for each monitor or TV above 4 per visit	Anything bigger than 40 yd roll off		Segregated in bins, separate bins for electronics	No
Greater Sudbury	Four	Landfill sites	N	Anything that contains hazardous waste		Baled	No
Guelph, City	One	Wet Dry Ctr	\$62/tonne or \$10/appliance	N		Y	Yes
Hamilton, City (D)	Three + 9 Env. Days	Transfer stns and mobiles	N	Y - any item containing CFC or liquid		N	No
Kelowna, City (D)	One	Landfill	\$25/Tonne	Barrels, wire	Not accepted by steel recycler	Baled	No
Kingston, City (D)	Two for 8 weeks of year	Landfill and transfer station	No charge for 8-week free period			N	No
Kitchener (Waterloo)	Eight serving all of Waterloo Region	Transfer facilities	Y - \$30/tonne, but first 50 kg free on loads under 500 kg; \$10 CFC removal for first unit, then \$25 for each additional unit	N		N	Yes
Laval, ville (D)	2 C&D sites owned by the municipality that accept metal C&D waste only	Municipal garages	na			N	na
Longueuil, ville (D)	Two	Municipal garages	N	N		na	No

Table 4.4 (continued) Depot collection programs

Municipality	Number of depots	Location	Fee/Amount	Exclusions?	Why?	Material sorted or compacted	Mercury Switches Removed?
Montreal, City	Six	City-owned sites	N	N		Y	No
Oshawa, City	One in Oshawa	Transfer station	\$90/tonne	N		Segregated into bins	No
Ottawa, City	One	Landfill	\$15 minimum tip fee is 67/tonne	No		No	No
Peterborough, City	Two - one for scrap metal; one for electronics	Metal depot at landfill; electronics at HHW depot	N	N		N	Yes
Quebec, City	Six	City-owned sites	Yes and No: first 3 cubic metres are free, then \$15/cubic metre	N, but not all collected is recycled		N	No
Regina, City (D)	One	Landfill	Only for freon removal	N		Y	Yes
Saskatoon, City (D)	One	Landfill	\$5.00 entry fee to site, plus \$10 for CFC removal	Y - electronics			Yes
St. Catharine's (Niagara)	Six	5 at landfill sites; 1 at MRF	\$50/tonne if mixed with waste	Anything radioactive, pressurized vessels		N	Yes
St. John's	One at landfill one at Newco Recycling	Landfill	N	Car parts			No
Saint John (D)	One	Landfill	\$10/cfc unit or \$28/MT			Sorted by local scrap dealer	No
Thunder Bay, City (D)	One	Landfill	\$4.00 for first 250 kg, then \$0.033/kg	Radioactive materials		No - just loaded and shipped to scrap metal dealer	No
Toronto, City	Two for scrap metal, five for electronics	Transfer stations	No fee for up to 150 kg			Only for refrigerant, then compact with backhoe	No
Trois Rivieres	One	Landfill	Free for residents of St Etienne, other must pay \$10/car; \$15/pickup, or \$34.70/tonne	N		Sorted into three different areas: metal, wood, garbage	No
Vancouver, City (D)	Two	Transfer strn. And landfill	N	Anything radioactive or containing HHW, or larger than bins.		N, but staff ensure contamination is kept to minimum	No
Victoria, City: Capital Regional District (D)	One operated by CRD, with others, public & private across region	Landfill	\$3.00/visit	N		Yes - ferrous and non-ferrous are sorted, as well as appliances	No
Windsor, City	One	Env Services yard	Y - \$10 for CFC items			Y	No
Winnipeg, City (D)	One	Landfill	\$22.50/Tonne			N	No

Drop off depots are commonly located at landfills and transfer stations. Other sites include municipal works yards and garages.

With the exception of Kingston, all of the sites are open year round. Most have Saturday hours, and three (Regina, Saskatoon and Vancouver) are open seven days per week. All but Longueil's sites are staffed.

Ten programs indicated that they do not charge any fees to receive appliances or scrap metal. Toronto and Quebec City waive fees up to a certain weight or volume. The City of Barrie allows four "free" drop offs per year, after which a fee is applied. St Catharines charges a \$50.00 fee if metal is mixed with waste.

Four programs charge only when appliances contain refrigerant (\$5-\$20). Edmonton charges \$3.00 per monitor or TV beyond four per visit.

Of the programs that charge fees, two charge a flat entry fee: Victoria: \$3.00/visit and Saskatoon: \$5.00/visit. The remaining programs charge fees based on the number or cumulative weight of items. These fees range from \$4.00-\$10.00 per appliance, and \$22.50-\$90.00 per tonne.

In London, where there is no municipally-run scrap metal program, residents must certify white goods as CFC-free, and deliver metal items to one of a number of scrap dealers in the city. Residents currently receive \$0.04.5 to \$0.06/lb (\$100.00 to \$134.00 per tonne) for delivered metal.

All but one depot (Laval) accept large appliances; all but five (Kingston, Kitchener, Longueil, Regina and Toronto) accept small appliances. Electronics are accepted by 15 programs, but with qualifiers for some. For example, Abbotsford will accept working electronics that can be salvaged by the Abbotsford-Mission Recycling Depot. Vancouver accepts VCRs for their metal content. Quebec City accepts electronics, but does not recycle them.

"Other" scrap metal items (barbecues, ladders, lawn chairs, etc.) are accepted by all of the depots. Brown goods (large items such as furniture with metal content) are accepted by 14 programs, two of which limit items to mattresses (Vancouver) and sofa beds (Toronto).

4.4.1 Sorting and Processing

Only one program (Victoria) reported that metal is sorted on site into ferrous and non-ferrous before shipment. Greater Sudbury and Kelowna both bale metal before shipment. Seven programs (Calgary, Guelph, Kitchener, Peterborough, Regina, Saskatoon and St. Catharines) remove mercury switches from appliances before shipping them. Regina, Saskatoon and Calgary also remove PCB capacitors from appliances, as required by their scrap metal receiver.



Scrap metal bins at Essex Windsor Solid Waste Authority



4.5 Scrap metal recovery and extraction

Eight programs indicated that there is some form of extraction (manual or mechanical) from waste prior to disposal:

Municipality	Extraction
Abbotsford, City	<ul style="list-style-type: none"> Manually from mixed waste
Chatham-Kent	<ul style="list-style-type: none"> Manually from dry waste
Edmonton, City	<ul style="list-style-type: none"> Mechanically and manually, from wet and dry
Guelph, City	<ul style="list-style-type: none"> Mechanically and manually from dry; Wet: mechanically
Halifax Regional Municipality	<ul style="list-style-type: none"> Manually from mixed; have grapple on front end loader but no magnet
Saskatoon, City	<ul style="list-style-type: none"> None currently, planning to sort ferrous from non ferrous and do onsite removal of Hg switches and PCB capacitors
St. John, City	<ul style="list-style-type: none"> Mechanically and manually from dry, and mechanically from mixed
Thunder Bay, City	<ul style="list-style-type: none"> Manually from mixed

In addition, a number of other programs indicated that residents are required to segregate materials at the drop-off area as they bring them in. St. Catharines (Niagara) provides incentive for such sorting at its drop-off sites by charging \$50.00 for any load of waste that contains metal.

4.6 Non-municipal collection – scrap yards

Only one municipality, the City of London, has no involvement in collecting scrap metal or white goods (with the exception of electronics, which are collected through the city's HHW depot). London takes the approach that the resident has some responsibility to ensure white goods and other scrap metals are properly managed.

No special collection is offered and the material is not accepted in the garbage. There are no drop-off facilities for scrap metal at the city's landfill. Instead the city provides residents with a list of licensed scrap dealers that will remove CFCs from refrigerators.

Eight other survey respondents indicated that there are a number of scrap yards within their jurisdictions that residents are encouraged to use for items not accepted by the municipal programs (primarily auto parts or C&D metal). Two suggested, in fact, that the fees charged at landfills or drop off depots for large items may encourage residents to use scrap yards, particularly if they receive revenue for the metal.

There is no reliable way to quantify how much residential source scrap metal is going to scrap yards and bypassing the municipal system, but the fact that it is occurring, likely more frequently in specific jurisdictions, could have a role in the wide discrepancy in quantities recovered as reported by municipal programs (see section 4.7).

4.7 Quantities

Table 4.7 summarises the tonnages for residential source scrap metal reported by survey respondents. Of the programs that reported tonnage, few were able to provide numbers for the different scrap metal categories, or indeed for ferrous vs. non-ferrous. For those that did provide a ferrous/non-ferrous split, the percentage of non ferrous to total metal ranged from 1.7 to 11%.

In a number of cases, tonnage for only a portion of the program (e.g., depots) or a portion of the year

were reported. The calculation of per household generation rate has not included these programs. For the remaining 14 programs, the calculated per household generation rate ranged from 5.6 to 35.5 kilograms. Note that no programs reported tonnages of residential-source scrap metal handled by scrap yards.

4.7.1 Generation vs Waste Composition Data

Waste composition data (present survey and WDO data) indicate that per household scrap metal ranges from one to 44.3 kilograms per year. (Note

Table 4.7 Scrap metal tonnages 2003

Municipality	Total	White goods		Electronics	Other	Ferrous	Non-ferrous	Ferrous/ non ferrous mixed	Kg/hhld (calculated)
		Large	Small						
Abbotsford, City	1386.41								
Barrie, City ¹	73								
Calgary, City	2999			220					11.5
Chatham-Kent	736								16.3
Edmonton, City	3648	1196	1748	275	429				13.6
Greater Sudbury	1400								22.2
Guelph, City	309	295		14					7.0
Halifax Regional Municipality	2500								17.3
Hamilton, City	1156.64								6.1
Kelowna, City	1040.6								35.5
Kingston, City ²	350.74								
Kitchener (Waterloo)	1330								18.4
Montreal, City ³	1,698.74					1,506.43	192.31		
Oshawa, City ⁴	146	66			80				
Ottawa, City ⁵	96								
Peterborough, City ⁶	308			4.36					
Quebec, City ⁷	1000								
Regina, City ⁸	725								
Saskatoon, City	769.87								9.6
St. Catharine's (Niagara)	963.06	414.7						548.36	17.3
St. John's ⁹									
Saint John	867.51					853.14	14.37		
Thunder Bay, City	558								
Toronto, City	5237.1	3557		111.1	1569				5.6
Trois Rivieres	400								
Vancouver, City ¹⁰									
Victoria, City: Capital Regional District	1691	500				1165	26		11.2
Windsor, City	1210.5	600.75		30	559.75	1201.14	36.2		18.3
Winnipeg, City	915								
Total	33,495.17								Range: 5.6 to 35.5 kg/hhld.

1. Tonnage for last quarter of 2003 only
2. Tonnage for 8 week free drop off period only
3. Depot tonnage only
4. Depot tonnage only

5. Curbside tonnage only
6. Depot tonnage only
7. Appliance and scrap tonnage only

8. Large appliance tonnage only
9. Tonnages not available
10. Tonnages not available

that for those programs reporting per capita in their waste composition studies, the calculated annual per household rate is 19.5 to 67.5 kilograms.¹

The substantial range in both the waste composition data and household generation calculated from reported tonnages underscores the points raised in Section 4.1 on the inability of waste composition studies and audits to accurately reflect all of the potential scrap metal in the residential waste stream.

Such discrepancies in generation rates can also be attributed to local availability and use of non-municipal options for disposing of scrap metal. It was noted by a few survey respondents that a number of their residents likely bypass municipal landfills or depots altogether in favour of scrap dealers or yards that might actually provide revenues, or at least charge nothing (rather than charge fees) for scrap metal.

Other non-municipal options for scrap metal include reuse centres ("ReStores") and thrift shops. Depending on the municipality, there could be substantial diversion of scrap metal through these options.

1. Using 2.5 as the average number of people per household

4.8 Program Costs and Revenues

4.8.1 Program Costs

Very few programs provided full cost information—of those that did, only one, the City of Edmonton, was able to a “total” cost of \$72,000. However even this figure can assumed to be partial as it does not include on site labour, administration or promotional costs.

Municipality	Program Costs	Calculated cost per tonne
Chatham-Kent	Collection: no cost	\$0
Edmonton, City	Partial: \$72,500, 98% of which is CFC removal, remainder is bin rental	\$19.87/tonne
Greater Sudbury	\$10/tonne	\$10.00/tonne
Victoria, City: Capital Regional District	Costs include \$100/month for bin rentals, \$120/haul (40 yd) + labour + admin.	N/A
Windsor, City	Curbside contractor only: \$50,000; Depot operation: \$650,000	\$2.42/tonne

Cost information is typically the most difficult information to get on a municipal survey such as this, particularly for programs such as scrap metal as many of the program costs are simply included with the total costs to operate the drop off depot, transfer station or landfill.

Often, costs are not broken out by material received (particularly labour and administration), and curbside collection costs can be part of waste or recycling costs over all in the collection contracts.

For example, the depot cost of \$650,000 provided by the Essex Windsor Solid Waste Authority includes on-site labour, heavy equipment, maintenance,

disposal and office/administration for all of the materials received at the site: tires, electronics, blue box materials, metal and waste. Allocation of cost based on weight or volume is difficult as the labour requirements for the different materials are quite different. It was noted, however, that under the present collection and site operating system, scrap metal has the highest labour requirements. Whether this is true in other jurisdictions would depend on how the program is organised. It is possible that short term contracts in times of higher metal revenues might even be close to zero, although this would be offset by higher costs in low revenue periods.

4.8.2 Revenues

Reported ferrous revenues at the time of the survey, ranged from \$53 to \$155 per tonne, while non ferrous ranged from \$1,060 to \$1,650 per tonne. Mixed/averaged revenues also showed a significant range, from a low of \$2.51/tonne (picked up by contractor) to \$90.00/tonne.

Metal revenues in general have been on an increase and may have reached a plateau. Commodity price fluctuations may or may not have an impact on the revenues received by a municipal program, depending on the terms set in contracts

with scrap metal haulers or dealers. However the impact could become apparent in the quantities received by programs if material is diverted to private scrap yards by residents looking for their own revenue.

Total annual revenues were calculated for those programs that were able to provide tonnages and fixed revenues. These revenues range from \$1,540 (depot tonnage only) to \$90,000 per program.

Table 4.8.2 Revenues

Municipality	Revenue			Calculated Revenues (on reported tonnages)
	Ferrous	Non-ferrous	Mixed	
Barrie, City			\$30/tonne	\$2,190 ¹
Chatham-Kent			\$13.6/tonne	\$10,009
Greater Sudbury			\$10/tonne	
Guelph, City			\$30/tonne	\$9,270
Halifax Regional Municipality			\$10-15/tonne	\$25,000-\$37,500
Kelowna, City			\$25/tonne	\$26,025
Kitchener (Waterloo)	\$53/tonne (average)			
Longueuil, ville			\$60/tonne	
Ottawa, City			55/tonne	\$5,280 ¹
Peterborough, City			\$5.00/tonne	\$1,540 ¹
Quebec, City	\$77-105/tonne			\$90,000 (provided by survey respondent)
Saskatoon, City			\$5.00/tonne	\$3,849.35
St. Catharine's (Niagara)			\$10-55/tonne	\$9,630—\$52,968
Saint John			Variable - e.g. \$10/tin; \$440/MT for steel	
Thunder Bay, City			\$9/tonne	
Toronto, City			\$2.51/tonne for contractor-collected; \$25 delivered by City	
Trois Rivieres			\$90/tonne	
Vancouver, City	83/tonne	1060/tonne		
Windsor, City	155.20/tonne	1140.00/tonne		As of Feb 1, 2004
Winnipeg, City	100/tonne	\$1.65/kg.		

1. On partial tonnage only

5.0 CASE STUDIES AND BEST PRACTICES

5.1 Case Studies

In the recovery of scrap metal from the residential sector, “white goods” have been the primary focus of municipalities. While some kind of drop-off depot is offered at most landfills and transfer stations, curbside collection of old refrigerators, washing machines and stoves is also offered by many municipalities – usually on a fee-for-service basis.

In many cases, this service stems back to the tradition of the annual spring clean-up, when householders cleaned out their backyards, garages and basements. In the days of low tipping fees and less focus on environmental issues, the material was often collected at no charge by the municipality, if set out on a given week or weeks.

The material was frequently destined for the landfill. Although a lot of the salvageable goods were removed from the curb by individuals before the scheduled collection, however for use in their own homes (in the case of operational or easily-repaired appliances and furniture), and by commercial scavengers who took it to scrap yards.

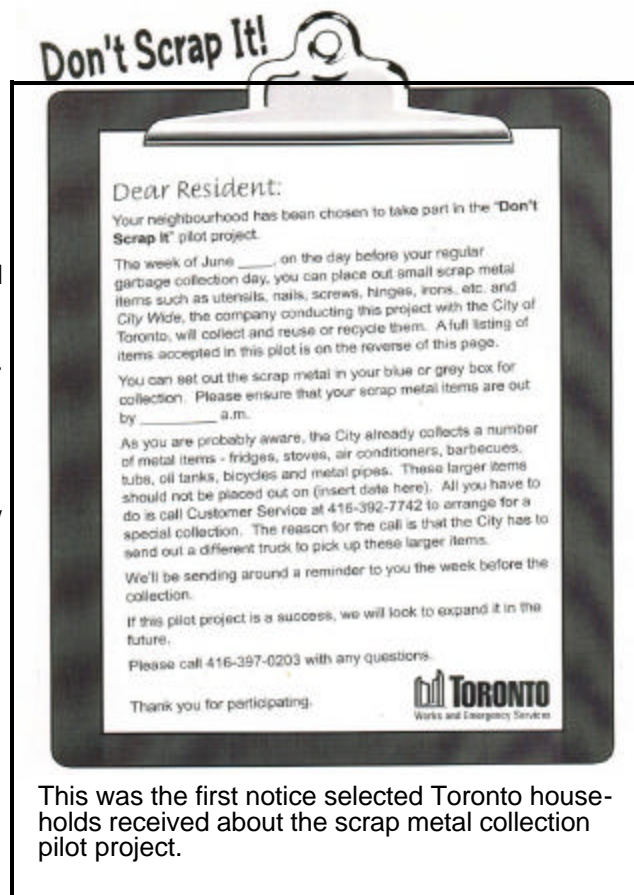
As tipping fees increased and environmental standards and awareness became higher, the tradition of the municipally-sponsored spring clean-up was either discontinued completely or evolved into a large-item/white goods collection. Given the quantity of metal in large appliances, and the public’s apparent willingness to pay a fee to have such items collected, the curbside service can be offered at little or no impact to the municipal budget.

Providing a place for residents to drop off scrap metals, even at no charge, is also relatively inexpensive. Whichever service is offered, the revenues from the sale of

the materials will in part offset the cost; indeed, given current scrap metal values, drop-off depots could even be seen as revenue generators for the municipality, depending on the contractual arrangement with the scrap merchant who takes the material.

Many of the drop-off depots also accept smaller scrap metal items, but few actively promote the fact. No one surveyed specifically offers a small scrap metal collection at the curb, although the City of Toronto undertook two pilot projects to see what level of participation might be achieved.

In addition, the Ottawa Valley Waste Recovery Centre will be adding scrap metal to its regular recyclable containers collection service to about 6,000 households this spring and summer, as part of pilot to test operating issues at the curb, on the collection vehicle and in the sorting plant. The following case studies provide a ‘cross-section’ of the kinds of program offered.



This was the first notice selected Toronto households received about the scrap metal collection pilot project.

5.1.1 City of Toronto

Two small-scale curbside pilots have been undertaken in the City of Toronto to determine the feasibility and waste diversion impacts of collecting small metal items from residents. The first pilot project was conducted in May 2002 in two representative areas of the city, each comprising approximately 2,000 households. A flyer was delivered to residents about four weeks before the scheduled collection. A reminder door hanger flyer was delivered one week before.

In total, the scrap metal collection pilot consisted of 4,056 single family households. A total of 239 households participated – a six per cent participation rate. The participating households set out

5,121 kg of scrap metal, which equates to approximately 22 kg per participating household. The collection contractor agreed to collect the material at

no charge, using a flat-bed truck. The contractor kept the revenue from the sale of the scrap metal (\$370.00). The city looked after promotion.

Typical scrap metal items collected included nails and screws, small appliances, car parts, hangers, fence parts, pots and pans, computer equipment and other miscellaneous household items.

Promotional material reminded householders about the existing city programs for managing white goods and large items.

As the material was to be collected before the regular recycling collection day, residents were advised to place their small metal items in the blue or grey boxes normally used for recyclables collection, although any rigid containers was acceptable.

A second pilot was undertaken in the spring of 2003. The same promotional strategy was used. It involved 8,000 households, including the 4,000 in the first pilot to determine if the participation rate will increase over time. It did not. While no final report from the second pilot is available, staff advise the participation rate was about the same as the first pilot, as was the average amount collected from those participating. No further pilots are currently planned.

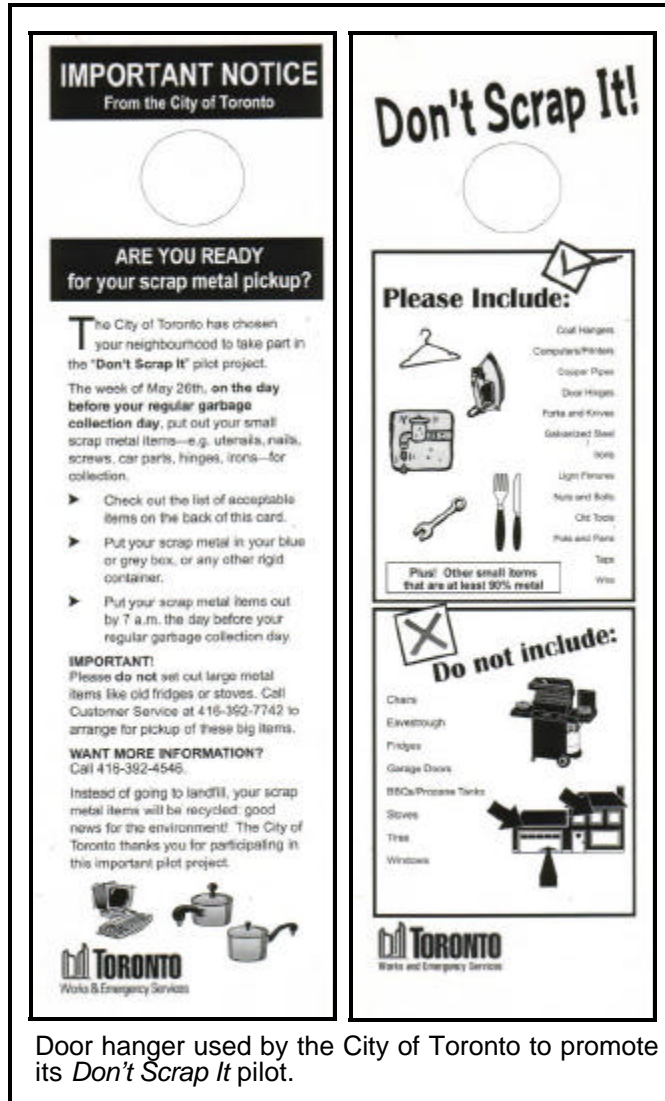
5.1.2 City of Guelph

In the City of Guelph, where a wet/dry program was introduced in the mid-1990s, a “dry” stream of waste is collected from each household on a weekly basis. (Since 2003, three streams have been collected: dry recyclables, wet compostables and waste.)

Dry recyclables are placed by residents in blue bags or loose in garbage cans, which are emptied at curbside into the collection vehicle. The material is taken directly to the city’s materials recovery facility (MRF) where it is dumped, then loaded onto a conveyor system. Recyclable materials are then removed either mechanically or by hand.

The promotion of the curbside collection focuses on packaging waste, although many small scrap metal items are still included by residents in the dry stream for curbside collection. Some items, such as metal hangers and small pieces of metal, can present a health and safety issue during collection and can get caught in the machinery in the sorting plant.

Any ferrous metal that the magnet in the plant picks up is baled along with the steel cans. In addition, pots and pans, metal coat hangers etc., are collected at various locations in the plant as they come along the belts and are added to the mix. There tends to be a high incidence of burned roasting pans, cookie sheets and stove rings. It is mainly ferrous and the city has never had problems with quality from the end market.



Door hanger used by the City of Toronto to promote its *Don't Scrap It* pilot.

While there is no dedicated collection of scrap metal per se, the city offers a year-round, user-pay bulky item collection program. This includes traditional white goods like refrigerators and stoves but can include furniture, carpets etc. The fee charged to the resident for the collection depends on the type and size of item.

All scrap metal items can be dropped off for recycling at the city’s waste facility.

5.1.3 Region of Durham

The Region of Durham provides a white goods/ scrap metal collection service to approximately 42,000 households in the rural townships of Scugog, Uxbridge and Brock and to the more urban municipality of Clarington. Items collected include appliances, barbecues, metal bath tubs, metal filing cabinets, shelving units, metal bed frames, water heaters, metal sink and faucets, furnaces, wood stoves, air compressors wheel barrows, bicycle frames etc.

In Clarington, this service is provided weekly on the regular garbage day. No appointment is necessary. If the driver of the regular garbage truck sees metal for collection, he will radio the scrap metal truck to come and collect it. The truck takes the material to the Oshawa waste management facility where there are bins for scrap metal. There is no charge for this service.

In the townships of Uxbridge, Scugog and Brock this is a call-in service only. Residents book an appointment and collection is provided during the first full week of each month on the regular garbage day. Items have often been taken by scavengers before they can be collected - a source of some concern for contractors.

5.1.4 Town of Markham

The Town of Markham is fairly typical of a medium-sized urban community in the service levels it offers. Its residents have two options to dispose of scrap metal. One is a by-appointment curbside scrap metal collection, once a month, free of charge. A contractor collects the metal and delivers it to the Markham Works yard where it is picked up by a metal recycling company. While there is no fee per appliance collected, there is a \$10 fee per appointment.

The second option Markham residents have is to deliver it themselves to one of our four recycling depots. Each depot has a scrap metal bulk bin that is collected weekly by a local scrap dealer. In 2003, 96,060 kg of scrap metal was dropped off to the depots. All scrap metal items except for car parts are accepted.

5.1.5 Township of McNab-Braeside

In the rural community of McNab-Braeside (pop 6800), where there is no municipal garbage collection service, the township does offer a free pick-up of appliances. This is designed primarily as a measure to reduce illegal dumping and has proved very

successful. The township also has a 25-yard bin at its landfill where ferrous and non-ferrous scrap metal can be dropped off at no charge. The material is collected by a local scrap dealer who sorts the metal at his yard.

5.1.6 City of Owen Sound

The City of Owen Sound has been holding an annual Goods Exchange Day for several years. The event is held on a Saturday in the spring. Residents are asked to have reusable or easily-repaired items on the curb by the early morning and to remove any item not taken by 6 p.m. The program can be seen as scavenging promotion, as no money changes hands and the city's only role is promotion. People are asked to place a sign on the item to confirm it may be taken. Similar programs operate in a number of communities. The only cost to the municipality is the promotion. Owen Sound also has a drop-off depot at its landfill for scrap metal. Freon and mercury switches are removed before the material is shipped for recycling.

5.1.7 Township of Tay

In the Township of Tay (Simcoe County, Ontario), there used to be an annual Scrappers Day. The event was actually a fund-raiser for the local community policing initiative. Residents were urged to place scrap metal on the curb and a contractor was hired to collect the material and deliver it to a scrap dealer. The event was discontinued a few years ago when scrap metal prices fell and has not been held since.

5.1.8 City of London

The City of London takes the approach that the resident has some responsibility to ensure white goods and other scrap metals are properly managed. No special collection is offered and the material is not accepted in the garbage. There are no drop-off facilities for scrap metal at the city's landfill. Instead, the city provides residents with a list of licensed scrap dealers that will remove freon from refrigerators.

5.1.9 City of Orillia

Residents in the Ontario city of Orillia (population 30,000) are encouraged to look at the reuse option before throwing out white goods (or any other reusable items). The city's *I Want You Outta My Life* guide lists various charities and non-profit groups, as well as scrap metal dealers. The city also has drop-off facilities for scrap metal at its landfill site. The city's user pay garbage system also acts as an incentive for householders to separate their waste at source. In 2003, 578 tonnes of material was re-

ceived, for an average 46 kilograms per household.

5.1.10 Simcoe County

In 2001, the County of Simcoe introduced a mixed waste policy of variable tipping fees at its landfill sites. Designed to encourage the source separation of materials delivered to the sites, the policy saw the introduction of three fee levels. Recoverable materials that are free of contamination are subject to half the regular tipping fee (\$52.50 per tonne); loads that are contaminated are levied at double the regular tipping fee (\$210 per tonne, as are loads of mixed waste which contain recoverable materials. Regular waste is levied at \$105 per tonne.

One effect of this policy is that large item pick-ups offered at the lower tier level do not include the collection of metal with non-metals, as most non-metals are destined for disposal.


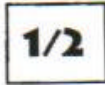

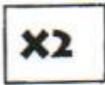


5.1.11 City of Edmonton

City of Edmonton residents place their fibre and container recyclables in blue bags while waste and organics are commingled and separated at the composting facility at the city's waste management centre.

Like the City of Guelph's program, the bags preclude the inclusion of sharp metal objects like hangers or broken pipes, but residents sometimes include small scrap metal items in with the recyclable containers, although this is not promoted.

The city also has a number of eco stations where scrap metal can be dropped off. There are plans to build a metal recycling facility at the waste management centre and computers and associated hardware are currently being stored as feedstock.



TIP FEES ...	
 Loads of recoverable materials free of contamination (ie free of non-conforming material) will be charged half the tip fee.	
 Loads of recoverable materials that contain contaminants unloaded at the designated areas will be charged twice the tip fee.	
 Loads of solid waste that contain recoverable items unloaded at the tip face will be charged twice the tip fee.	

Simcoe County tipping fee schedule

5.1.12 City of Montreal

In the newly-amalgamated city of Montreal, the current collection services are still very much reflective of the pre-amalgamation set-up. Curbside pick-up of white goods and scrap metals are generally offered in the suburban areas along with garbage collection.

In many cases, this means the metals are taken to landfill. In the former city of Montreal boroughs, however, white goods collection is offered with waste pick-up but the materials are taken to the public works yards and are separated for recycling. There are also six "eco-centres" in the central area that accept white goods and scrap metal for recycling. These are open to all Montreal residents and there are plans to open more eco-centres in the suburban areas.

5.1.13 Town of Cochrane, Alberta

The Town of Cochrane's recycling depot offers drop-off facilities for various recyclable materials. Its 30-metre scrap metal bin is shipped to Calgary Metal twice a month. All types of metal are accepted with the exception of propane tanks, aerosol cans, and barbed wire. Residents with old Bicycles or parts may drop them off at a separate location. They are picked up and taken to the local Spynhill Prison and refurbished for the Salvation Army.

5.1.14 Prince Edward Island

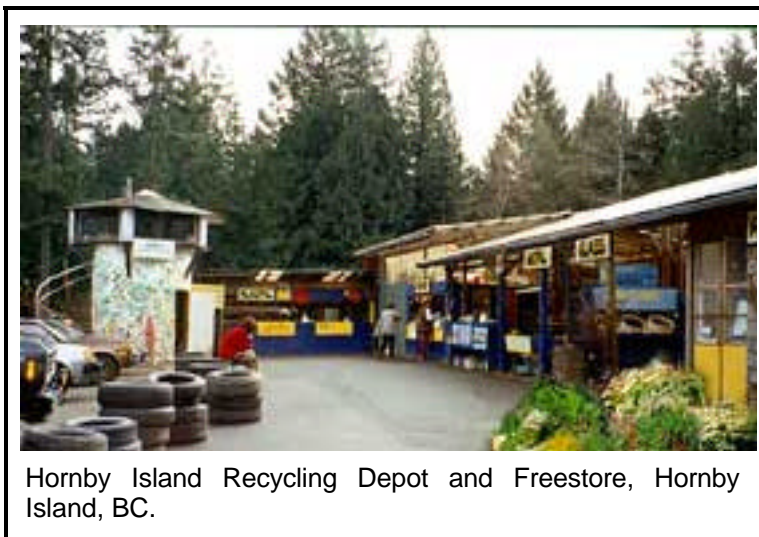
The Waste Watch program in Prince Edward Island offers residents a special scrap metal pick-up in the spring and in the fall. This "clean-up" is part of the annual \$155 fee that includes biweekly collection of waste and organics in carts and monthly collection of bagged recyclables.

They also receive a special spring and fall yard waste and garbage pick-up.

The scrap metal collection is contracted out by the Island Waste Management Corporation (IWSC), the Crown Corporation that operates the service. Residents are asked to bundle scrap metals and to keep the size to less than 4 feet in length and 80 pounds (34 kgs) in weight. In the spring of 2003, five contractors collected a total of 288 tonnes of recyclables metal and an estimated 216 tonnes in the fall. There are also six drop-off depots across the Island where scrap metals can be taken.

5.1.15 Hornby Island, BC

The focus at the Hornby Island Recycling Depot, founded in 1978, is very much on reduction and reuse. Through aggressive educational programs, the island residents have reduced their waste to



Hornby Island Recycling Depot and Freestore, Hornby Island, BC.

about a less than half a kilogram per capita, per day.

A key part of the diversion effort is the depot's Freestore, which carries a wide range of "odds and ends". In its promotion, the depot staff urges people dropping off a non-working appliance to add a note saying what is wrong with it.

A significant collection of parts has developed over the years. The depot staff tell the story of a contractor who was compacting dumpster loads when a bolt was lost from his backhoe shovel. A replacement bolt was found in the Freestore and he was able to continue. The Freestore is also frequented by small appliance repair people looking for parts.

5.1.16 St. John's NF

In the City of St. John's, residents are given two options to recycle metals. From May to

September, they may call in for a pick-up and there is no charge for this service. Acceptable metals include regular white goods and other appliances, but the city also lists many large metal items not normally specified in other collection programs. These include bicycles, metal doors, lawnmowers, disassembled swing sets, metal shower tracks (no glass), barbecues, metal railings and metal bedsprings.

People may drop off recyclable metals year-round at a metal recycling facility just inside the gate of the city's Robin Hood Bay Landfill. The facility is operated by local contractor. This is a free service for St. John's residents.

5.2 What are the Best Practices?

Municipal programs that specifically address scrap metal, such as they are, vary from one municipality to another, as do local conditions. It might be argued, therefore, that this precludes any one single activity from being deemed a “best practice”. What may be considered a “best practice” in one area or circumstance may not be feasible in other areas or circumstances. This section examines some of the options that may be available to municipalities looking to increase recovery of scrap metal.

Given the relatively small (although not insignificant) quantities of scrap metal in the household outside of the white goods category, a regular dedicated curbside collection is likely not feasible for most communities. There may, however, be opportunities to “piggyback” on existing programs.

5.2.1 Adding to an existing white goods drop-off program

Certainly, any program that offers drop-off depots for white goods should be able to take *all* scrap metals and it would then just be a question of promotion. Indeed, given the high value of aluminum, and the increasing value of steel, any such scrap metal recovery program may well pay for itself.

5.2.2 Call for Service, Based on the User Pay Principle

By encouraging householders to call for pick-up when they have scrap metal ready for collection and charging for the service on a cost-recovery basis, a municipality can offer maximum service without adding to the tax burden.

5.2.3 Adding to a White Goods Collection Program

Communities where a curbside pick-up is offered could encourage householders to put out all their scrap metal, not just their old refrigerators and washing machines, for example. There may have to be some revision of contracts and consultations with the end markets but the prospect of extra material should outweigh any handling issues. Note that some collection vehicles may not be suitable to handle all scrap metal—siding and other items with sharp edges could damage truck hoses, so the range of materials that will be collected should be reviewed with contractors to ensure suitable collection equipment is used.

5.2.4 Radioing for a Dedicated Scrap Metal Pick-up as Needed

Having a truck available to collect scrap metal, and having other on-road staff radio for pick-up as they

see material out for collection maximizes the vehicle and driver’s time. This is likely not an option for smaller programs and requires some coordination of resources so the dedicated vehicle is not sitting waiting for a call but is occupied in other non-time sensitive activities

5.2.5 Adding to an Existing Fibre and Consumer Packaging (Blue Box or Bag) Recycling Collection Program

Adding scrap metal to an existing fibre and consumer packaging (blue box or bag) program would be more challenging. If the program uses plastic bags rather than boxes or carts, there could be concerns with bags tearing. There would also be health and safety issues with sharp edges from broken metal pieces or from coat hangers.

Assuming these could be overcome with proper recycling preparation education aimed at householders, there could still be capacity issues for the blue box or cart and perhaps even the truck itself. If a vehicle is going to “cube out” prematurely, the feasibility of the collection could be compromised. Whether scrap metal could be added to the material stream at the MRF would depend on how the plant is set up. It may be that some items (like steel) could be added but others (like copper) may not be suitable for the conveyor system. Consideration should also be given to excluding specific items from collection that could create problems on sorting lines and conveyors, such as wires and coat hangers.

In Ontario there would be issues with adding materials to the blue box that is not packaging or newsprint, as the funding formula under the Waste Diversion Act is based on the weight, and obligated stewards would be difficult to identify. These are issues, however, for the body overseeing the funding programs, Waste Diversion Ontario. With a mandate to increase diversion from landfill, the WDO board has access to a great deal of insight and experience. If the operational issues of adding scrap metal could be overcome, there would be pressure to overcome the bureaucratic issues.

5.2.6 A Special Scrap Metal Pick-up Once or Twice a Year

Notwithstanding the relatively low participation rate in the Toronto scrap metal collection pilot, the recovery per household, at 22 kilograms, suggests the material is out there. While a weekly, bi-weekly or even monthly collection may not be economical, a once- or twice-a-year collection might be an option.

In communities where the collection could be done in one or two days, residents could use their blue boxes for their scrap metal pick up, as they did in Toronto. As long as the boxes were empty in time for the blue box pick up, they would still be available for the regular recycling collection. A lot of people, however, may use their blue boxes to store their recyclables as they generate them, so any program that interferes with that would be seen as inconvenient and many studies have shown that convenience is the key to participation. It would be helpful to interview some of the Toronto participants and non-participants to gauge their response to the convenience question.

Allowing residents to use cardboard boxes would be an alternative but there are always issues with rain and the "prompting" affect of the blue box would be lost. Alternatively, people could be encouraged to store their scrap metal in a cardboard box and to transfer it to their blue box on pick-up day (and placing the blue box recyclables in the cardboard box while the blue box was not available). This is feasible but not really convenient and would not be easy to promote.

A dedicated box for scrap metal collection and storage in the home would address the above but the cost would be high. Even at \$100 per tonne, 22 kilograms of scrap would be worth perhaps \$2.00 revenue per household, which would be less than half the cost of the box, and does not include the cost of pick-up, delivery and processing.

5.2.7 Enhanced Promotion and Emphasis on Other Scrap Metals

One thing that has become clear from the survey is that the promotion of scrap metal programs is very much focused on the main constituent of the stream: white goods. While some programs mention old bicycles and may use the term "scrap metal" there is no great emphasis placed on, or specific identification of, the smaller scrap metal items. This might be the place to start.

Similarly, in those programs that offer curbside pick-up of white goods, for example, more emphasis could be placed on what else could be collected at the same time.

5.2.8 Financial Incentives

5.2.8.1 Paying for Scrap Metal

Given the cost of offering a curbside collection program for scrap metal, municipalities might find it

more economical to offer their residents payment for the scrap metal they drop off at recycling depots and landfill sites. In some cases, people have to pay to drop off their scrap metal and this would clearly act as a disincentive, and would not be reflective of the high value of aluminum (and copper) and the current market conditions for steel.

It is acknowledged there would be operational issues (payment levels, security, cash/change, labour costs etc.), but many of these issues have already been addressed and resolved in some cases by entering into partnerships with other agencies. There is also the question of competing with the private sector scrap yards, but it could be argued that by collecting aluminum cans and other consumer packaging made of metal this competition already exists.

5.2.8.2 User Pay Waste Collection

Any program that encourages people to divert recyclables from their domestic waste stream should see an increase in the recovery of scrap metal, and adopting the user pay principle for waste has proved to be the most effective incentive of all. By their very nature, scrap metal items tend to be heavy and/or bulky. Thus, programs like the City of Orillia, where the user pay principle is applied for waste, in conjunction with a convenient and well-promoted scrap metal program, should see increased recovery of that material, as well as many other recyclables.

5.2.8.3 Tipping Fees that Favour Source Separation

Just as user pay programs apply levies to garbage but generally offer the recycling service at no charge, different rates at the landfill can encourage source separation of materials. The degree of difference between fees charged for source-separated recyclables and regular waste, and for loads which are unsorted or contaminated may vary, but having no difference offers no incentive to the generator whatsoever.

5.2.9 Enhancement and Encouragement of Reuse Activities

There are often many opportunities already in place in a community to divert certain materials from landfill (thrift stores, annual yard sale events, reuse businesses etc.) and a municipality's role may be limited to promotion, encouragement and assistance to these activities. This could be as simple as making a list of "reuse" facilities (and in the case of metals, scrap dealers) available to residents. It could be a municipally-sponsored reuse guide, or

tipping fee relief to thrift stores and associated activities.

A growing trend in larger municipalities is the establishment of "eco centres" (e.g., Montreal) where various waste diversion services are offered, including some kind of reuse facility. These are often partnerships with non-profit sector organizations like Goodwill.

5.2.10 Making the Most of the Opportunities to Remove Refrigerant, Mercury Switches and Sensors, and PCB Capacitors

Of all the options considered in this report, removing hazardous materials or components from metal appliances is one that can certainly be considered a best practice. While not yet required by law, in some parts of the country, it may be argued that the removal of refrigerant from refrigerators, freezers and air conditioners represents due diligence for any program with the mandate of environmental protection. This can be undertaken at the municipal level (or required of a contractor).

In the past year or so, a growing number of municipalities have started removing mercury switches from freezers and sensors from gas appliances. This can be done relatively easily and cheaply. Some of the programs interviewed even remove PCB-containing capacitors from certain old models of refrigerators and freezers.

6.0 CONCLUSION

The Residential Scrap Metal Recovery Survey and follow-up research undertaken in the past two months suggest that residents in Canada's large municipalities generally have good access to programs for managing their used appliances, but there is little emphasis on the smaller scrap metal items.

The per-household average generation rates, based on annual amounts collected and on information provided by waste composition studies, vary widely. Neither method can be relied upon, however, to be a true reflection of what is available.

There have been private scrap metal dealers for probably longer, in some cases, than there has been municipally-sponsored garbage collection. How much scrap metal, particularly the larger items, that goes straight from the household to the dealer is unknown.

And while the traditional waste composition study may be a good reflection of everyday waste generation, and particularly helpful for consumables and packaging wastes, it cannot provide much assistance in determining scrap metal generation in a given household. People may not regard scrap metal as "garbage" for immediate disposal, and they may store it elsewhere: the garage, the basement. It may well, at some point, be taken for disposal as part of a larger "load for the dump", but is not treated in the same way as regular trash.

The aim, therefore, is to intercept that recoverable material before it is disposed. The best way to do that is to encourage the generator to separate the recoverable materials from those materials for which there is no other option than disposal. This can be achieved by offering dedicated collection and drop-off programs, and by encouraging residents to use those programs through education and incentives.

While the scrap metal survey requested copies of promotional materials geared towards scrap metal collection and recycling there was little supplied and the only pieces specifically aimed at non-white goods scrap metal were from the City of Toronto's pilot project. When the Ottawa Valley Waste Recovery Centre undertakes its pilot this spring there will be dedicated material for that program, also.

The cost of providing these programs will vary on the level of service offered but unlike much of the "waste stream", there is always a market for recovered metal. Prices paid for non-ferrous materials like aluminum (more than \$1,500 per tonne) are higher than any other material a municipality recycles and after several years of low prices, ferrous metals are currently in the \$100 per tonne range. Considering the amount of time and money municipalities have spent over the years trying to move recovered glass and other low-value "blue box" materials, the high value of scrap metal should make any effort at enhancing its recovery an attractive proposition.

One of the unexpected benefits of this project has been the opportunity to share information about the recovery of hazardous materials from white goods. While the recovery of refrigerant from refrigerators is quite common (although by no means universal), the removal of mercury switches and sensors is a growing trend. In at least three prairie municipalities capacitors are being removed from some old models of refrigerators and freezers to recover the PCBs.

7.0 NEXT STEPS

The promotion and enhancement of existing programs would likely be the most cost-effective first step to increasing recovery of scrap metal. Thus, the development of generic promotional materials for on-site use at depots as well as educational literature would be helpful. This could involve identifying the most prominent of the smaller scrap metal sources (lawn chairs, barbecues, bicycle frames and parts) and focusing the promotion specifically on these items.

Consultation with scrap markets about any possible contaminants could be undertaken before any program approach is finalized. It may well be helpful to make contact with national metals recycling organizations to determine the level of interest in supporting such a campaign.

This material could then be distributed to the survey respondents and to other municipalities through provincial environment ministries, municipal organizations and recycling councils. Indeed, there could be a nation-wide campaign aimed at recovery scrap metal and the distribution of the material could be part of that campaign.

Currently, the Toronto pilot and the imminent OVWRC pilot are the only programs geared to curbside collection of non-white goods scrap metals from the household. It would be helpful to interview participants and non-participants about the programs, and to talk to the contractors about set-out and make-up of the materials put out for collection.

The incentive to source-separate offered by the reduction or waiving of tipping fees for scrap metals and other recyclables appears self-evident but not all municipalities offer this concession. Follow-up contacts with the survey respondents could ascertain the extent of tipping fee reductions, the promotion supporting the policy and the rationale in the cases where no relief is offered.

It is clear from the research that the technology and knowledge exists to remove refrigerants, mercury switches and sensors and PCB-containing capacitors. A priority should be to make this information widely available. (In the course of the research, the AMRC received three requests for a video it made with the Region of Niagara on removing mercury switches.)

While reports and manuals are helpful at providing information for municipal program decision makers, the support and peer discussion offered by a workshop environment are generally more effective at "lighting the spark" to action. A workshop would also enable some of the practical issues to be addressed.

Appendices

Appendix 1: Scrap Metal Survey

Residential Scrap Metal Recovery Survey

Municipality:.....

Contact name:.....

Number of households served:.....

Mailing address:.....

.....

Tel: Fax:

Email:.....

Note: This survey is concerned with the kinds of metals not recovered in blue box/depot container recycling programs.

Waste composition/audit studies

- 1. Have you ever conducted waste composition/waste audit studies which included the amount of scrap metal in your garbage stream? Y / N
2. If yes, how much did you find? (kg/cap/year) Audit date:
3. The primary components of scrap metal are ferrous (e.g. steel and tin) and non-ferrous (e.g. aluminum and copper). If the study separated the two, please indicate the split:
Ferrous..... Non-ferrous.....

Municipal scrap metal program

- 4. Is there a municipal program (or pilot) in place to recover scrap metal? Y / N
If yes, please go to question #5 if it is curbside collection. Please go to question #7 if it is a drop-off program:
5. If a curbside program, do you accept:
a) White goods:
large appliances (including micro-waves) Y / N
small appliances (toasters, kettles, can openers) Y / N
b) Electrical/electronic waste (computers etc., radios, TV's, cell phones) Y / N
c) Other residential scrap metal (bikes, lawn chairs, metal siding, pipes, barbeques, grills and grates, etc. with high metal content) Y / N
d) Brown goods (furniture, mattresses and other bulkies that have some metal content)- Y / N please specify:
e) Are any scrap metal items excluded from your program? Y / N.....
If yes, why?.....

(page 2 of 3)

6. Curbside programs - how is the program set up?

- a) Call for service (as required)
- b) Special (e.g. spring/fall) collections
- c) Scrap metal is collected with other household recyclables
- d) Scrap metal is collected with the garbage and disposed
- e) Other (please specify).....
- f) Is there a fee for this service? Y / N If yes, please specify.....
- g) Does your municipality encourage curbside scavenging?.....
- h) How?.....

7. If a municipal drop off depot, do you accept:

- a) White goods:
 - large appliances (including micro-waves) Y / N
 - small appliances (toasters, kettles, can openers) Y / N
- b) Electrical/electronic waste (computers etc., radios, TV's, cell phones) Y / N
- c) Other residential scrap metal (bikes, lawn chairs, metal siding, pipes, barbeques, grills and grates, etc. with high metal content) Y / N
- d) Brown goods (furniture, mattresses and other bulkies that have some metal content - Y / N please specify).....
- e) How many depot sites do you have?
- f) Where are they located? (e.g. Public Works yards)
 -
- g) What are the days and hours of operation?
- h) Are the sites staffed? Y / N
- i) Is there a drop off fee or tipping fee? Y / N If yes, please specify:
- j) Are any scrap metal items excluded from your program? Y / N
 - If yes, why?

8. Is the material sorted or compacted before it is shipped out?

Y / N

9. If your community relies solely on private scrap yards (i.e. no municipal program),

- a. What materials do they accept?
- b. How many local operators are there?.....
- c. When can residents drop their scrap metal off?

10. In some parts of the country, scrap metal is mechanically or manually extracted before landfilling. Do you recover scrap metal from a ...

- d. Mixed waste stream: Yes-mechanically; Yes-manually; No
- e. Dry waste stream: Yes-mechanically; Yes-manually; No
- f. Wet waste stream: Yes-mechanically; Yes-manually; No

(page 3 of 3)

Quantities and Cost:

11. How much residential scrap metal do you recover annually (tonnes)?

- a) White goods:
 - large appliances (including micro-waves)
 - small appliances (toasters, kettles, can openers)
- b) Electrical/electronic waste (computers etc., radios, TV's, cell phones)
- c) Other residential scrap metal (bikes, lawn chairs, metal siding, pipes, barbeques, grills and grates, etc. with high metal content)
- d) Brown goods (furniture, mattresses and other bulkies that have some metal content - Y / N please specify).....

Do you have totals for ferrous metals recovered?.....

Do you have totals for non-ferrous metals recovered?.....

If no breakdown is available, please provide total tonnage.....

Approximately how much is the scrap metal worth (\$/tonne)?

Ferrous.....

Non-ferrous.....

9. Public Education and Promotion: Please send a copy of any materials you use to promote the recovery of residential scrap metal.

Please email back to amrc@golden.net or fax to (519) 823-0084

Questions? Please call Ben Bennett or Cynthia Hyland at the AMRC: 519 823-1990.

Thank you for your help!

Appendix 2