Appendix A
Residential Waste Diversion Programs

Table A-1 2017 City of London Residential Waste Management Programs– Estimated Tonnes Diverted

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This appendix provides a description of the City's various waste diversion programs and the quantity of material diverted by each program in 2017.

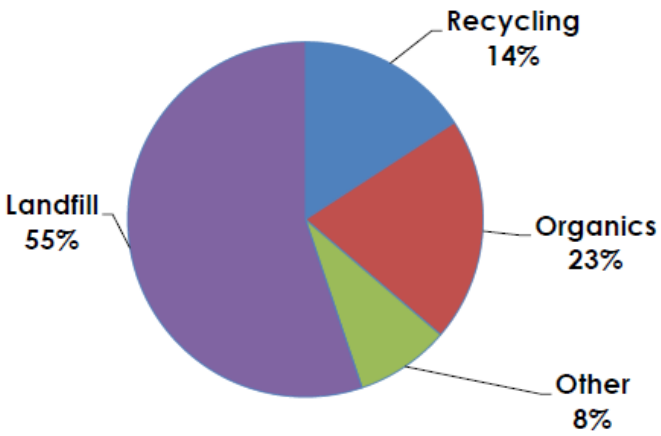
This data is summarized in Table A-1 and Figure A-1.

Table A-1: 2017 CITY OF LONDON RESIDENTIAL WASTE MANAGEMENT PROGRAMS – ESTIMATED TONNES DIVERTED

PROGRAMS	Single Family Households	Multi-Residential Households	Total Tonnes
Recycling			
a) Curbside Recycling Program	18,670	0	18,670
b) Multi-Residential Recycling Program	0	3,220	3,220
c) City Depots (EnviroDepots, W12A)	620	260	880
d) Public Space Recycling (estimate)	30	20	50
Subtotal	19,320	3,550	22,820
Organics Management			
e) Home Composting Program (estimate)	5,680	0	5,680
f) Grasscycling (estimate)	3,580	0	3,580
g) Curbside Yard Waste Collection	5,250	0	5,250
h) Depot Yard Waste Collection	16,240	0	16,240
i) Fall Leaf Collection	4,760	0	4,760
j) Christmas Tree Recycling	100	0	100
Subtotal	35,610	0	35,610
Other Programs			
k) Waste Electronics & Electrical Equipment	200	70	270
l) Tire Recycling	2,310	570	2,880
m) Wood Waste/ Construction, Renovation & Demolition Waste	5,070	0	5,070
n) Scrap Metal	690	70	760
o) Textile/Small Household Item Reuse	1,390	350	1,740
p) Municipal Household Special Waste	430	110	540
q) Brewers Retail Container Recycling	1,750	440	2,190
Subtotal	11,840	1,610	13,450
Total Waste Diverted	**66,770**	**5,160**	**71,880**
Total Waste Disposed[1]	**65,500**	**24, 230**	***89,730***
Total Waste	**129,900**	**29,400**	**161,610**
Diversion Rate	**50%**	**18%**	**45%**

Notes 1. Includes process residuals from recycling and composting programs.

Figure A-1 - 2017 Waste Diversion



Blue Box Recycling Programs

Curbside Recycling – 18,670 tonnes

The City collects a wide range of recyclables from all curbside households as part of its Blue Box Recycling program. The materials collected in 2017 were newsprint & flyers; household paper; magazines, catalogues & books; paper egg cartons & boxes; cardboard boxes; glass bottles & jars; aluminum food & beverage cans; steel food & beverage cans; foil containers & foil; empty metal paint cans; empty aerosol cans; plastic bottles, jugs, plant pots/trays, large pails & tubs; milk & juice cartons; drink boxes and cardboard cans.

Materials collected were taken to the City's Manning Drive Regional Material Recovery Facility (MRF) for processing and subsequent shipping to various end markets. This facility also receives recyclables from other City programs and other municipalities. Material is weighed upon entering and leaving the MRF.

A portion of this material is allotted to each program (curbside, multi-residential, other municipalities) equal to the percentage of incoming recyclables from each source. In 2017, 20,340 tonnes of materials were collected curbside of which approximately 1,670 tonnes would become process residuals.

Multi-Residential Recycling – 3,220 tonnes

The City collects the same range of recyclables at the majority of multi-residential buildings. The property owner is responsible for purchasing and providing 360 litre carts for residents to sort their recyclables. As a result, a few multi-residential buildings do not have recycling because the property owner has not provided carts. In 2017, approximately 50,000 multi-residential units had access to on-site recycling and 3,000 units did not. Residents from buildings without on-site recycling must take their recyclables to one of four City EnviroDepots. City staff have made numerous attempts to further reduce the number of units without on-site access to recycling.

The materials collected, how they are processed and calculation of the quantity recycled is the same as the curbside Blue Box program. In 2017, 3,560 tonnes of materials were collected from multi-residential buildings of which approximately 290 tonnes would become process residuals.

Depot Recycling – 880 tonnes

As noted above, the City operates four EnviroDepots (Oxford Street, Clarke Road, Try – Clarke Road and W12A Landfill) that accept a range of materials including Blue Box recyclables. The Blue Box materials collected, how they are processed and calculation of the quantity recycled is the same as the curbside Blue Box program.

The Blue Box materials accepted is the same as the curbside Blue Box program.

In 2017, 960 tonnes of materials were collected from multi-residential buildings of which approximately 80 tonnes would become process residuals.

Public Space Recycling – 50 tonnes

The City has over 40 EnviroBins located throughout the Downtown, Old East Village, Richmond Row and Wortley Village, for use by the residents when they are out shopping or going to restaurants and/or for the residents that live above some commercial establishments. Each EnviroBin has three compartments: containers, paper and garbage.

The Blue Box materials accepted is the same as the curbside Blue Box program.

Organic Programs

Home Composting – 5,680 tonnes

The City sells composters at cost at its Oxford Street and Clarke Road EnviroDepots. In the 1990's the City also sold composters at "truck load sale events". Over the years the City has sold 55,900 composters including approximately 800 in 2017. The *Manual on Generally Accepted Principles (GAP) for Calculating Municipal Solid Waste System Flow* recommends that municipalities assume each composter sold diverts 100 kilograms per year. This estimate is based on many factors, assumption and measured programs generally between the years 2000 and 2010. It remains a reasonable number and used by Ontario municipalities.

Grasscycling – 3,580 tonnes

The City stopped collecting grass clippings in 1995 and started promoting grasscycling. Grasscycling refers to leaving grass clippings on the lawn when mowing.

Because grass consists largely of water (80% or more), contains little lignin, and has high nitrogen content, grass clippings easily break down and return to the soil within one to two weeks, acting primarily as a fertilizer supplement and, to a much smaller degree, a mulch. Grasscycling can provide 15-20% or more of a lawn's yearly nitrogen requirements.

The amount of grass diverted in 2017 was estimated to be approximately 30 kilograms per curbside household or 3,580 tonnes in total. **Curbside Yard Waste Collection – 5,250 tonnes**

The City provides curbside collection of yard materials. This includes plant trimmings, brush and branches up to 10 cm in diameter. In 2017 yard materials were collected on a six week cycle and each home received five collections.

The collected yard materials are transported to TRY Recycling's composting facility for processing. The incoming material is weighted. On average about five percent of the incoming material becomes process residuals and 95% is either consumed during the composting process or is made into compost and sold. In 2017, 5,510 tonnes of yard materials were collected curbside of which approximately 260 tonnes would become process residuals.

Curbside Fall Leaf Collection – 4,760 tonnes

The City provides curbside collection of fall leaves beginning in mid-October. Yard materials are also collected with the fall leaves. In 2017 fall leaves were collected on a three week cycle and each home received three collections.

The collected yard materials are transported to TRY Recycling's composting facility for processing. Approximately 4,760 tonnes were collected. On average about 5% of incoming material becomes residue (or about 240 tonnes). How they are processed and the calculation of the quantity composted is the same as for yard materials.

Depot Yard Material Collection – 16,240 tonnes

Residents can drop off yard materials at the City EnviroDepots year round. The collected yard materials are transported to TRY Recycling's composting facility for processing. Approximately 13,880 tonnes were collected. How they are processed and the calculation of the quantity composted is the same as for yard materials. There was assumed to be 5% residue from processing or about 690 tonnes.

Christmas Tree Collection – 100 tonnes

In 2017, the City offered Christmas tree curbside collection during the first week in January. All four EnviroDepots were also accepting Christmas trees for composting. The trees are chipped on-site at the Depot locations and trees collected curbside were taken to TRY Recycling where they are chipped and composted.

Other Programs

Waste Electronics and Electrical Equipment Recycling – 270 tonnes

Waste Electronics and Electrical Equipment (WEEE) recycling is made up of two components. The first component is electronics collected at the EnviroDepots and shipped for recycling. In 2017 the EnviroDepots collected 210 tonnes of material electronics were shipped through the Ontario Electronic Stewardship (OES) program. The second component is appliances collected at the EnviroDepots and recycled. In 2017, 60

tonnes of appliances were collected and recycled. This does not include WEEE that is delivered by Londoners to other drop-off locations in the city.

Tire Recycling – 2,880 tonnes

The annual Municipal Datacall administered by Resource Productivity & Recovery Authority (RPRA) compiles information on materials diverted and disposed by Ontario municipalities. Most of the information used by the RPRA is provided by the local municipality but some of information comes from programs administered by provincial organizations. In the case of tires, information on the quantity of tires recycled in a community is provided by the Ontario Tire Stewardship. This organization looks after the Used Tires Program in Ontario and ensures tires are reused or recycled.

The 2017 Datacall estimate is 2,880 tonnes of tires were recycled/reused in the City of London. Included in this total is 70 tonnes of tires collected at the three City EnviroDepots as part of the Used Tire Program.

Construction, Renovation and Demolition Material Recycling – 5,070 tonnes

The City banned the collection of construction renovation and demolition waste in the 1980's. At the time the average household produced about 15 kilograms of wood waste and renovation material waste each year. At the time of the ban it was assumed about half of this material would be recycled and about half would likely continue to be landfilled as residents would hide small amounts wood waste and renovation materials in their garbage bags for collection.

Beginning in 2004, the City's EnviroDepots began to accept wood waste and renovation materials (including shingles) for recycling. The material is taken to TRY Recycling for processing where approximately 50% to 60% is made into useable products and 40% to 50% becomes residual and is landfilled. The City also accepts of wood at the W12A Landfill which is made into wood chips for on-site use.

In 2017, the EnviroDepots received 2,470 tonnes of wood waste and renovation materials. Approximately 2,225 tonnes of this material was recycled and 245 tonnes became Residual Waste and was landfilled. A further 1,975 tonnes of wood waste was recycled at the W12A Landfill.

It was assumed that approximately half of the residential renovation materials not taken to an EnviroDepots (870 tonnes) was taken to private construction, renovation and demolition waste recycling companies (TRY Recycling and Green Valley Recycling) and recycled while the other 50% (870 tonnes) was residue from recycling, hidden in the residential garbage or disposed of privately.

Scrap Metal Recycling – 760 tonnes

The City stopped the collection of scrap metal (e.g., barbeques, bicycles, etc.) and appliances in the 1990's. At the time the average person produced about 2.5 kilograms of scrap metal each year. At the time of the ban it was assumed about half of this material would be recycled and about half would likely continue to be landfilled as residents would hide small amounts of metal in their garbage bags for collection.

Beginning in 2004, the City's EnviroDepots began to accept scrap metal for recycling. The material is taken to Zubick's for processing. It is assumed 100% of the metal is recycled. In 2017, the EnviroDepots received 520 tonnes of scrap metal.

It was assumed that approximately half the residential scrap metal not taken to an EnviroDepots (240 tonnes) was taken to other scrap metal dealers and recycled while the other 50% (240 tonnes) was placed in the garbage.

Textile/Small Household Item Reuse/Recycling – 1,740 tonnes

In 2017, residents could take textiles, books and small household items to a Goodwill drop off located at the Oxford Street and Clarke Road EnviroDepots. Goodwill has estimated that they received 540 tonnes of material at these locations.

The City offers free disposal of materials to not-for-profit reuse organizations (e.g., Goodwill) to encourage and support these programs. The RPRA Datacall estimates that reuse/recycling organizations given free disposal increase their diversion efforts by 10% and this incremental increase is part of a municipalities diversion estimate.

Approximately 12,000 tonnes of materials were diverted from landfill in 2017 through reuse/recycling organizations receiving free disposal which translates into an additional 1,200 tonnes toward municipal diversion.

MHSW Recycling – 540 tonnes

The City collects all forms of Municipal Hazardous and Special Waste (MHSW) at the HSW depot at the W12A landfill including paints, solvents, pesticides, oil filters, used oil, antifreeze, batteries, florescent bulbs, compressed cylinders and oil & antifreeze containers. Some of these materials (batteries, florescent bulbs, compressed cylinders and oil & antifreeze container) are also collected at the Oxford Street and Clarke Road EnviroDepots.

The materials are shipped to various processing facilities across Ontario licensed to accept this material. The majority of the material is recycled including paint, antifreeze and oil.

The estimate of the weight of material diverted is based on a combination of actual weights for some materials and estimated weights based on the volume shipped for other materials.

Brewer's Retail /LCBO Bottle Recycling/Reuse – 2,180 tonnes

The 2017 RPRA Datacall shows 2,180 tonnes of Brewer's Retail and Liquor Control Board of Ontario (LCBO) containers being recycled/reused in the City of London.

Appendix B
Community Engagement Activities

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Appendix B1

Open House #2

November 29, 2017 Horton Street Goodwill Industries (3rd floor) 255 Horton Street (at Wellington), London 2 - 4 p.m. and 5 – 8 p.m.	November 30, 2017 Lambeth Community Centre 7112 Beattie Street, London 2 - 4 p.m. and 5 – 8 p.m.

The Open Houses were advertised in The Londoner newspaper on November 16 and 23, 2017; on the City's calendar; on the City website; by London.ca public notices November 16 and 23, 2017; in the London's City Green publication; on the City's Facebook page on November 26, 2017; on posters at select City facilities; on the City's e-news on November 13 and 17, 2017; on the London Environmental Network and on the project website.

Letters or emails were sent between November 14 – 16 to local businesses that use the existing landfill, neighbours within 2 km of the Waste Management and Resource Recovery Area, community groups and PLC members. Individuals who signed up at Open House #1 and on the project website were sent an email on November 27, 2017. One person was sent a letter on November 27.

At these open house sessions the public learned about changes to waste management and diversion coming from the Province, potential programs/initiatives to achieve 60% diversion and key technologies for advanced diversion and resource recovery. Another focus of the open house was to inform the public and seek input on the preliminary conceptual 'Alternative Methods' for landfill expansion and the criteria to be used to comparatively evaluate the 'Alternative Methods'.

A total of 38 (19 related to waste diversion) display boards were featured at Open House #2. Boards pertaining to waste diversion and photos of the open house are included in Appendix B1.

This event was designed to provide opportunities for attendees to speak directly with the City and the EA consulting team. Attendees were asked to sign in and were encouraged to fill out a comment sheet to provide feedback and recommendations.

A total of 34 and 43 people attended Open House #2 on November 29 and 30, 2017, respectively. The overall atmosphere of the open house was professional, courteous and respectful.

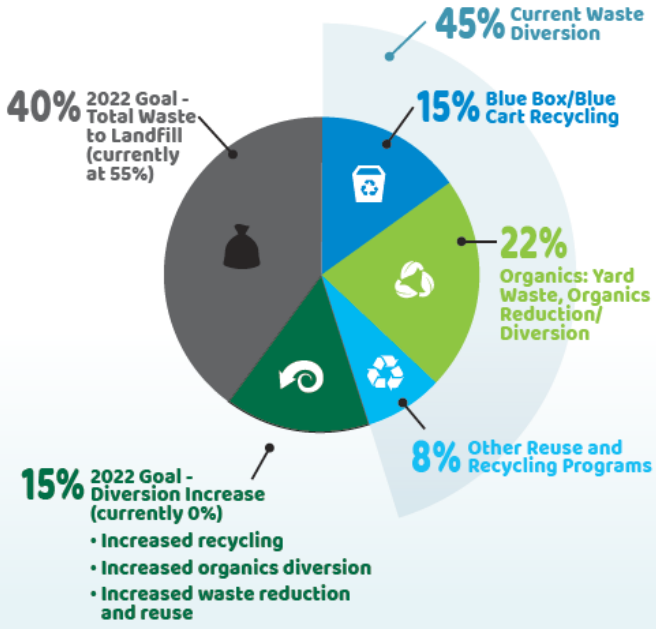
Comments were received through completion of the formal feedback sheet from 34 people. In addition, one email exchange was received where the public provided feedback. Overall, meeting attendees were satisfied with the information presented and provided positive feedback on the quality of the information materials and answers provided. A summary of the feedback comments is provided in Appendix C.

Resource Recovery Strategy Boards from Open House 2

Why Waste?

London's Short-Term Waste Diversion Goal

On October 30, 2017, Council set a short-term waste diversion goal of 60% by 2022. Please review the information presented and let us know how you think we can reach our 60% target.



Why Waste?

Upcoming Changes in Ontario:
Extended Producer Responsibility

What is Extended Producer Responsibility?

Extended Producer Responsibility (EPR) means that the companies that produce or import products in Ontario will be fully responsible for having them recycled or reused.

Currently, municipalities pay for about half of the cost of the Blue Box program. The new legislation - The Ontario Waste Free Act - will shift full responsibility to producers (and importers).

What products will EPR apply to?

- To start: Blue Box materials, tires, electronics, and municipal hazardous & special waste. These materials will transition to EPR in the next 2 to 5 years.
- In the near future: carpets, mattresses and furniture will be considered.
- In the future: other materials (e.g., wooden furniture, etc.) will be considered.

What does this mean for London meeting its Diversion Target?

The intent of the legislation is to increase diversion across Ontario. Higher diversion targets will provide legislative backing to help us meet our goal of 60% by 2022.

Upcoming Changes in Ontario:
Food and Organic Waste Action Plan

What is the Food and Organic Waste Action Plan?

Food and organic wastes make up approximately one-third of Ontario's total waste stream. To reduce and manage this waste the Province is developing a Food and Organic Waste Action Plan. The Final Plan will recommend steps to:

- Reduce the amount of food that becomes waste in the first place
- Divert food and organic waste from landfill

What's expected in the Final Plan?

The Final Plan is scheduled to be released in early 2018 and is expected to include:

- Targets for food waste reduction
- Targets for food and organic waste diversion from landfill
- Mandatory food and organic waste programs for municipalities with a population over 50,000
- Possible ban on disposal of food and organic waste at transfer stations and disposal facilities (e.g., landfills)

What does this mean for London meeting its Diversion Target?

An organics management program (e.g., green bin, recovery of organics from mixed waste) will be part of our strategy to reach our diversion goal of 60% by 2022. Final decisions on London's organics management plan will need to wait until the Food and Organic Waste Action Plan has been finalized.

Getting to 60% by 2022

FEEDBACK REQUESTED

The following boards focus on the specific strategies that will help get us to our waste diversion target of 60% by 2022. **Please complete the Feedback Booklet and tell us what you think about the different options.**

Organics Management

- Food waste reduction initiatives
- Home composting
- Community composting
- City wide organics program

Recyclables

- Carpet, mattresses and textiles
- Electronics, scrap metal and small metal appliances
- Wooden furniture
- Bulky plastics

Waste Reduction & Reuse Programs (examples)

- Waste Reduction Programs: lending libraries, repair workshops
- Community outreach programs: environment days
- Policies and by-laws: landfill bans, reduced garbage limit, pay per container, use of clear bags for garbage, mandatory separation programs

Why Waste?

Food Waste Reduction Initiatives

4 FEEDBACK REQUESTED

Background:

On average each London household wastes about $600 worth of food over the course of the year. This is food that could have been eaten but wasn't.

This is waste that could have been avoided. Below are moderate and significant initiatives that will focus on reducing food waste.

Tell us how much you want us to invest in this initiative?[1]	Moderate (investment of resources)	Significant (investment of resources)
How will resources be invested?	• Promotion and community outreach programs, and information to households.	• Same as Moderate plus provide each household with a food waste reduction tool kit to help them reduce food waste.
How much closer will it get us to the 60% goal?	0.12% (190 tonnes) →	1.3% (2,100 tonnes)
Annual cost	$180 K →	$1.2 M
Cost per household	$1 →	$7
Cost per tonne	$950 ←	$570
Expected annual household savings	$ 1 M →	$10 M
GHG[2] avoided	600 tonnes →	6,100 tonnes
GHG reduction for every tonne diverted	2.9 tonnes	

One tonne of GHG reduction is equivalent to removing 1 car off the road for 3 months.

1. Approximate range of costs and tonnes are provided based on best available data.
2. Greenhouse Gas

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Why Waste?

Home Composting

5 FEEDBACK REQUESTED

Background:

Home composting plays an important role in waste reduction in London. The City has sold close to 56,000 units that contribute to an estimated 5,600 tonnes of food and yard waste that is managed in backyards across London.

Tell us how much you want us to invest in this initiative?[1]	Existing (Home Composting Program)	Moderate (investment of resources)	Significant (investment of resources)
How will resources be invested?	• Promoted seasonally, sell 'at cost' at EnviroDepots	• Moderate additional promotion and 50% subsidy of composters	• Significant additional promotion and outreach and 75% subsidy of composters
How much closer will it get us to the 60% goal?	3.5% (included in 45% current diversion rate)	0.2% (300 tonnes) →	0.7% (1,100 tonnes)
Annual cost	$150 K (saved in avoided landfill/processing costs)	$130 K →	$210 K
Cost per household	No additional	$0.75 →	$1.20
Cost per tonne	No additional	$450 ←	$190
GHG[2] avoided		240 tonnes →	900 tonnes
GHG reduction for every tonne diverted	0.8 tonnes		

One tonne of GHG reduction is equivalent to removing 1 car off the road for 3 months.

1. Approximate range of costs and tonnes are provided based on best available data.
2. Greenhouse Gas

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Why Waste?

Community Composting

FEEDBACK REQUESTED 6

Background:

Community composting options can range from setting up backyard composters for resident use at a multi-residential building to installing higher tech composter units for public use in parks and community spaces.

What type of program? [1]	Low Tech (Private)	Low Tech (Public)	High Tech (Public)
How will resources be invested?	• Composting at apartment buildings where residents can compost kitchen waste using large backyard composters or three-compartment wooden composters.	• Community locations where citizens can compost their garden or kitchen waste using large backyard composters or three-compartment wooden composters.	• Community locations where citizens can compost their garden or kitchen waste using technologies such as small-scale digesters or mechanical composting units.
How much closer will it get us to the 60% goal?	0.01% (20 tonnes)	0.01% (20 tonnes)	0.1% (200 tonnes)
Annual cost	$2 K	$4 K	$80 K
Cost per household	$0.01	$0.02	$0.45
Cost per tonne	$150	$300	$400
GHG [2] avoided	16 tonnes	16 tonnes	160 tonnes
GHG reduction for every tonne diverted	0.8 tonnes		

One tonne of GHG reduction is equivalent to removing 1 car off the road for 3 months.

1. Approximate range of costs and tonnes are provided based on best available data.
2. Greenhouse Gas

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Why Waste?

City Wide Organics – Curbside Program

FEEDBACK REQUESTED 7

Background:

A City wide organics collection program would provide the biggest boost to our waste diversion target of 60% by 2022. It is estimated that it would increase our diversion rate in the range of 9 to 14%.

A green bin is the most common type of program in Ontario for managing household organic waste and will be considered for London. Mixed Waste Processing is another option. Organics would continue to be collected with garbage, but instead of going to landfill the collected waste would be sorted to remove organics and recyclables, and anything left over would be landfilled.

What type of program? [1]	Curbside Green Bin Program	Mixed Waste Program
How will resources be invested?	• Weekly collection of kitchen organics from approximately 120,000 curbside households. • Organic waste is separated by homeowners and placed out for a separate organics pickup.	• Residents would continue to place organic waste in garbage. • Organic waste would be separated from garbage at a mixed waste processing facility to be composted or anaerobically digested
How much closer will it get us to the 60% goal?	9% (14,000 tonnes)	14% (22,000 tonnes)
Annual cost	$3.5 M	$7 M
Cost per household	$20	$40
Cost per tonne diverted	$250	$300
GHG [2] avoided	11,000 tonnes	18,000 tonnes
GHG reduction for every tonne diverted	0.8 tonnes	

One tonne of GHG reduction is equivalent to removing 1 car off the road for 3 months.

1. Approximate range of costs and tonnes are provided based on best available data.
2. Greenhouse Gas

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Why Waste?

City Wide Organics - Multi-Residential Program

8 FEEDBACK REQUESTED

Background:

About 30% of London's households live in multi-residential (apartment/condo) buildings and generate approximately 22,000 tonnes of garbage per year. The garbage from multi-residential buildings is similar to the garbage from single family households. The main difference is a higher percentage of recyclables in the garbage and less of the garbage is compostable. Options for diversion of organic waste from the multi-residential sector are the same as for curbside households: separation of organics in the home for collection (e.g., green bin program) or collection of unsorted waste that is later sorted in a mixed waste processing facility.

What type of program?[1]	Multi-residential Green Bin Program	Mixed Waste Program
How will resources be invested?	• Weekly collection of kitchen organics from approximately 55,000 multi-residential units. • Organic waste is separated by homeowners and placed out for a separate organics pickup. Collection carts would be stored in a common common area similar to how recycling is stored.	• Residents would continue to place organic waste in garbage. • Organic waste would be separated from garbage at a mixed waste processing facility to be composted or anaerobically digested.
How much closer will it get us to the 60% goal?	1.5% (2,500 tonnes) →	5% (8,000 tonnes)
Annual cost	$1.3 M →	$2.4 M
Cost per household	$7 →	$14
Cost per tonne diverted	$500 ←	$300
GHG[2] avoided	2,000 tonnes →	6,400 tonnes
GHG reduction for every tonne diverted	0.8 tonnes	

One tonne of GHG reduction is equivalent to removing 1 car off the road for 3 months.

1. Approximate range of costs and tonnes are provided based on best available data.
2. Greenhouse Gas

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London CANADA

Why Waste?

Other Recyclables

9a FEEDBACK REQUESTED

Background:

Mattresses, carpets and wooden furniture are currently collected as garbage in London. There is potential to recycle these materials. In fact, the Province has already identified mattresses and carpet as materials they wish to target for recycling in the future.

How will resources be invested?[1]	Moderate (Collection at an EnviroDepot)	Significant (Semi-annual collection + EnviroDepot program)	
	The data below reflect the two investment options.		
	Carpet	Mattresses & Box Springs	Wooden Furniture
Impact on Diversion	0.1% (160 tonnes)	0.3% to 0.6% (500 to 1,000 tonnes)	0.1% (160 tonnes)
Annual cost[2]	$50 K to $140 K	$0.5 M to $1.1 M	$9 K to $90 K
Cost per household	$0.30 to $0.80	$3 to $6	$0.05 to $0.50
Cost per tonne	$350 to $850	$900 to $1 K	$50 to $500
GHG[3] avoided	400 tonnes	1,300 to 2,600 tonnes	600 tonnes
GHG reduction for every tonne diverted	2.6 tonnes	2.6 tonnes	3.8 tonnes

One tonne of GHG reduction is equivalent to removing 1 car off the road for 3 months

1. Approximate range of costs and tonnes are provided based on best available data.
2. Program costs may be covered in future under provincial program.
3. Greenhouse Gas

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London CANADA

Why Waste?

Other Recyclables

9b FEEDBACK REQUESTED

Background:

Electrical equipment & scrap metal, textiles and bulky plastic items are currently being recycled and reused in London. However, a significant quantity of these materials continue to be landfilled. There is potential to increase diversion of these materials.

How will resources be invested?[1]	Moderate (Collection at an EnviroDepot)	Significant (Semi-annual collection + EnviroDepot program)
	The data below reflect the two investment options.	
	Electrical Equipment, Metal	Textiles	Bulky Plastics
Impact on Diversion	0.1% to 0.2% (160 to 320 tonnes)	0.2% to 0.5% (320 to 800 tonnes)	0.03% to 0.06% (50 to 100 tonnes)
Annual cost[2]	$20 K to $110 K	$0 K to $110 K	$20 K to $80 K
Cost per household	$0.10 to $0.60	$0 to $0.60	$0.01 to $0.40
Cost per tonne	$125 to $350	$0 to $150	$400 to $800
GHG[3] avoided	700 to 1,400 tonnes	3,000 to 8,000 tonnes	50 to 100 tonnes
GHG reduction for every tonne diverted	4.4 tonnes	10 tonnes	1 tonne

One tonne of GHG reduction is equivalent to removing 1 car off the road for 3 months

1. Approximate range of costs and tonnes are provided based on best available data.
2. Program costs may be covered in future under provincial program.
3. Greenhouse Gas

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Why Waste?

Waste Reduction & Reuse Initiatives

10 FEEDBACK REQUESTED

Background:

These initiatives focus on raising awareness of options to reduce waste and engage citizens to make small changes to daily life.

The impact of any one initiative may not be significant, but together small changes contribute to cultivating a culture of waste reduction, and over time could make a significant difference to how we manage resources.

As some of those listed are already underway in our community through other organizations, we could explore options to build partnerships as well as establish new sharing programs where they are needed.

More research is required to understand the potential impact on diversion and GHG reduction.

How will resources be invested?		Moderate Investment	Significant Investment
Program Cost for Examples		Per household Net annual cost	
Lending libraries	Lending of materials and equipment that are used infrequently means less product production and can save money for households. Tool lending libraries, for example, are being developed in London.	$0.25 $45 K	$0.50 $90 K
Repair workshops	There is potential to reduce waste through repair and reuse workshops. These workshops will train interested citizens on how to fix household items (e.g., bikes, furniture, etc.) and extend their lives.	$0.25 $45 K	$0.50 $90 K
Promote reuse events	Explore options for reuse events to facilitate trading, selling or giveaway of materials for reuse (e.g., furniture, toys) in a convenient, yet structured way so that the events do not contribute to litter or illegal dumping.	$0.25 $45 K	$0.50 $90 K
Waste reduction education and outreach	Increase of general awareness campaigns on waste reduction (e.g., in addition to the above, buy in bulk, buy products that last, repair products, avoid disposable products, unaddressed ad mail opt out, etc.)	$0.55 $100 K	$1.10 $200 K

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Why Waste?

Waste Reduction Policies

FEEDBACK REQUESTED

Background:

Many of the City's waste diversion and reduction programs are voluntary; there is no mandatory recycling by-law for example. Other programs are written into the waste collection by-law, such as the 3 container limit on garbage, and a collection ban on materials such as scrap metal, appliances, and electronics.

Expanding the power of the by-law to reduce waste can be an effective means of increasing waste diversion. Changes to the by-law can also be implemented at relatively low cost. However, implementing by-law changes may not be popular, and this needs to be considered as we go forward. Alternative approaches that provide incentives to reduce will also be explored.

More research is required to understand costs, citizen acceptance of by-law changes, potential impact on diversion, and GHG reduction.

Do you support changes to the By-law to increase waste diversion? Indicate which of the examples below you support.	Yes	No
Expand & enforce material bans Some materials are banned from collection at the curb and landfill (e.g., electronics, scrap metal, appliances, and tires). This could be expanded to include materials that can be recycled/composted now or in the future, such as: Blue Box recyclables, wooden furniture, mattresses, carpet, and organics. An expanded list of banned materials may require additional enforcement to be effective.		
Clear bags for garbage Some municipalities have introduced clear bags for garbage to facilitate enforcement of material bans. Generally, clear bag programs have an allowance for one non-clear privacy bag.		
Reduced garbage container limits Further reduction of garbage container limits may be implemented in conjunction with new diversion programs, such as a city-wide organics program. This may also be accomplished by reducing frequency of collection of garbage (from once per six business days to bi-weekly collection).		
User pay In larger communities, user pay for garbage is typically restricted to cart based programs; residents pay an annual fee based on the size of cart they select.		
Performance-based incentives Some examples include: use of incentives such as point reward systems, or a "gold box" for correct recycling, rebate in User Pay programs for selection of the small size cart.		

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Why Waste?

Current Waste Diversion and Resource Recovery Research

Residential Food Waste Avoidance Pilot

- Audits show up to two-thirds of food waste is avoidable
- Testing various methods to change behaviour

Mixed Waste Processing Pilot

- 25% to 50% of material in garbage could be recovered and diverted
- Further testing/research required

Waste Composition Studies

- Determine what remains in garbage
- Four season audit

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Why Waste?

London Waste to Resources Innovation Centre

- Part of Council's Strategic Plan (2015 - 2019)
- Potential research, testing and training centre for business, institutions and municipalities
- Working with partners (e.g., ICFAR) to examine new, emerging and next-generation resource recovery and waste conversion technologies… from feedstocks to end markets
- Focus on waste diversion and resource recovery associated with:
  - Household garbage
  - Other materials targeted by the Provincial Government
  - Source separated or facility separated organics
  - Other marketable products and/or creation of energy resources
  - Other "waste materials" into resources
  - Creating higher value end products
  - Growing the local and regional economy

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Why Waste?

Possible Long Term Resource Recovery Options

Waste Conversion

Thermal or biochemical conversion of waste into synthetic gas, biofuel, biochar, etc.

Requires pre-processing of mixed waste

Energy-From-Waste (EFW)

Incineration of waste creating energy and ash

None or limited pre-processing of mixed waste

Mixed Waste Processing/ Mechanical/Biological

Processing of mixed waste into organic and non-organic portions with recovery of recyclable material (limited)

Organics portion could be landfilled, composted to stabilize the waste prior to landfilling or sent to an anaerobic digester to create biogas and digestate

Non-organic portion could be landfilled or converted to Solid Recovered Fuel (e.g., pellets)

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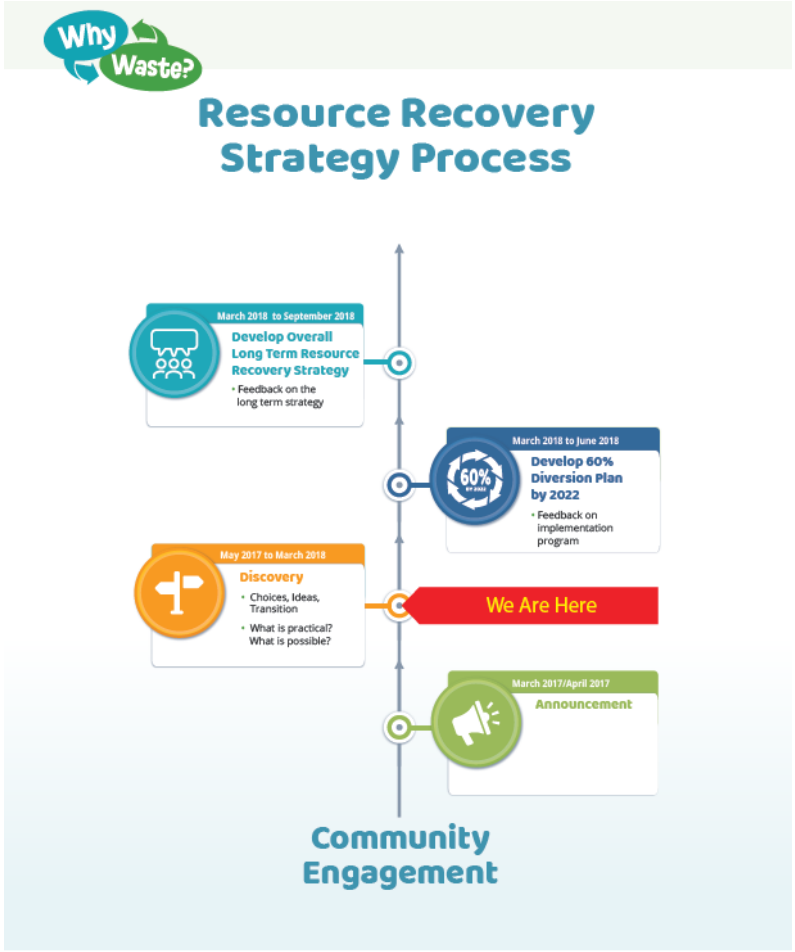
Why Waste?
Resource Recovery Strategy Process
March 2018 to September 2018
Develop Overall Long Term Resource Recovery Strategy
Feedback on the long term strategy
March 2018 to June 2018
60%
Develop 60% Diversion Plan by 2022
Feedback on implementation program
May 2017 to March 2018
Discovery
Choices, Ideas, Transition
What is practical? What is possible?
We Are Here
March 2017/April 2017
Announcement
Community Engagement
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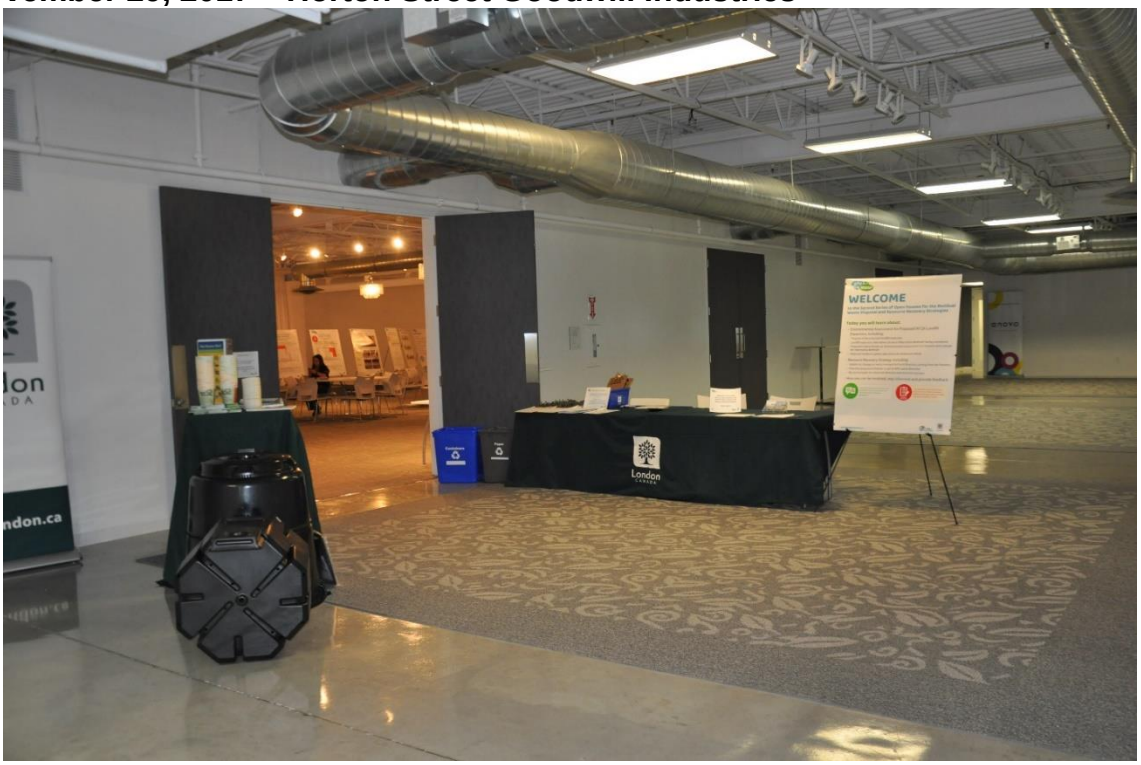
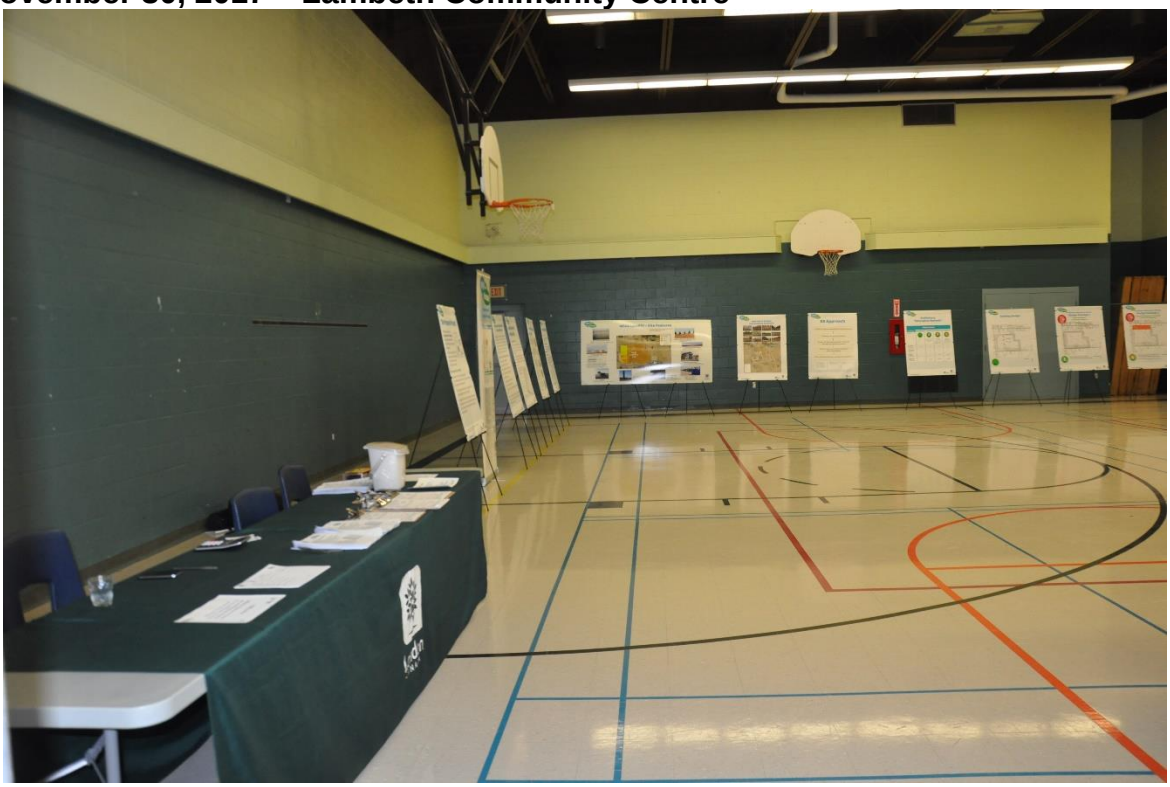
London

Photos from Open House 2

November 29, 2017 – Horton Street Goodwill Industries



Photos from Open House 2
November 30, 2017 – Lambeth Community Centre



Appendix B2

Open House #1

May 24, 2017 Horton Street Goodwill Industries (3rd floor) 255 Horton Street (at Wellington), London 2 - 4 p.m. and 5 – 8 p.m.	May 25, 2017 Lambeth Community Centre 7112 Beattie Street, London 2 - 4 p.m. and 5 – 8 p.m.

The Open Houses were advertised in The Londoner newspaper on May 11 and 18, 2017; on the City website between May 11 and 25, 2017; in the London Free Press on May 13 and 20, 2017; on the City's Facebook page and Twitter on multiple dates; on posters at select City facilities; on the City's e-news on May 18, 2017; and on the London Environmental Network website.

Letters or emails were sent to local businesses that use the existing landfill, neighbours within 2 km of the Waste Management and Resource Recovery Area, community groups, neighbouring regional municipalities and PLC members between May 11 and May 17, 2017.

This open house provided a general overview of current City of London waste management programs as well as the EA process for the proposed expansion of the W12A Landfill site.

A total of 25 display boards were featured at Open House #1. Boards pertaining to the Resource Recovery Strategy and photos of the open house are provided in Appendix B2.

This event was designed to provide opportunities for attendees to speak directly with the City and the EA consulting team. Attendees were asked to sign in and were encouraged to fill out a comment sheet to provide feedback and recommendations.

A total of 21 and 44 people attended Open House #1 on May 24 and 25, 2017, respectively. The overall atmosphere of the open house was professional, courteous and respectful.

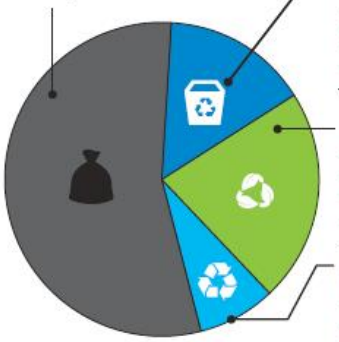
Comments were received through completion of the formal feedback sheet from five people. In addition, two email exchanges and a phone call were received where the public provided feedback. The public also provided thoughts on the City's Facebook page. Overall, meeting attendees were satisfied with the information presented and provided positive feedback on the quality of the information materials and answers provided. A summary of feedback comments is provided in Appendix C.

Resource Recovery Strategy Boards from Open House 1

Why Waste?

City of London 2016 Waste Diversion

55% Total Waste to landfill - 87, 700 tonnes



- *In 2016, the total residential waste generated was approximately 158,000 tonnes*
- *55% was sent to landfill and 45% was diverted through waste diversion programs (recycling, reduction, reuse, composting and recovery)*

15% Blue Box/Blue Cart Recycling - 23,300 tonnes

- Curbside recycling (19,300 tonnes)
- Multi-residential recycling (3,400 tonnes)
- City EnviroDepots (550 tonnes)
- Public space (50 tonnes)

22% Yard Waste/Organics Reduction and Diversion - 34,700 tonnes

- Home composting (5,600 tonnes)
- Grasscycling (3,300 tonnes)
- Yard materials/fall leaves (curbside and depots) (25,700 tonnes)
- Christmas trees (100 tonnes)

8% Other Reuse and Recycling Programs - 12,700 tonnes

- Appliances (100 tonnes)
- Electronics (300 tonnes)
- Tires (2,800 tonnes)
- Construction, renovation & demolition (4,400 tonnes)
- Scrap metal (700 tonnes)
- Reuse (i.e. Goodwill at EnviroDepots) (1,700 tonnes)
- Household Special Waste (500 tonnes)
- Bottle deposit programs (2,200 tonnes)

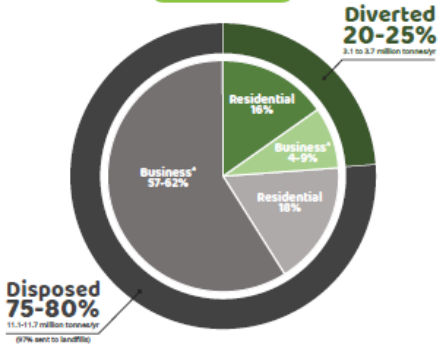
London

Why Waste?

London and Provincial Total Waste Diversion Rates

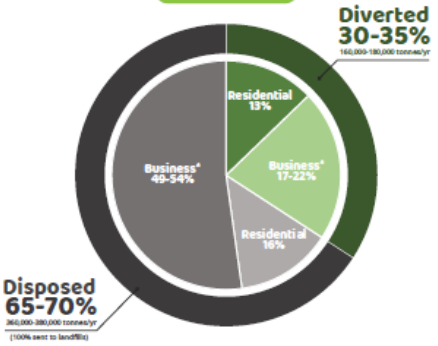
Solid Waste in Ontario

Ontario Residential Waste Diversion Rate 48%



Solid Waste in London

London Residential Waste Diversion Rate 45%



* Business waste includes industrial, commercial and institutional (IC&I) waste as well as construction, renovation and demolition (CR&D) waste

London

Why Waste?

Residential Waste Diversion and Disposal

Municipality	Management of Residential Waste (2015)	Diversion Program: Blue Box Recycling	Diversion Program: Green Bin	Diversion Program: Leaf/Yard Materials	Diversion Program: Other Programs	Disposal: Landfill	Disposal: Energy-from-waste (EFW)	New, Emerging and Next Generation Technologies (Municipal responses as of Fall 2016)
City of London	45% 55%	✓ 16%	0%	✓ 16%	✓ 13%	✓ 55%	0%	• Will examine diversion options during the development of the new Resource Recovery Strategy.
Regional Municipality of Durham	54% 46%	✓ 18%	✓ 11%	✓ 11%	✓ 14%	✓ 15%	✓ 31%	• Developing a business case for mixed waste processing and anaerobic digestion of the residual waste stream prior to EFW.
Essex Windsor Solid Waste Authority	38% 62%	✓ 15%	0%	✓ 15%	✓ 8%	✓ 62%	0%	• No recent investigations.
City of Guelph	81% 28%	✓ 13%	✓ 16%	✓ 13%	✓ 19%	✓ 39%	0%	• At appropriate times in agreements and waste disposal contract cycles; explore alternatives to landfill, including energy-from-waste technologies.
Regional Municipality of Halton	57% 42%	✓ 21%	✓ 14%	✓ 13%	✓ 9%	✓ 43%	0%	• Study completed in 2007 looking at energy-from-waste and thermal waste conversion technologies, decided not to pursue this option.
City of Hamilton	47% 52%	✓ 17%	✓ 14%	✓ 7%	✓ 9%	✓ 53%	0%	• Will examine alternative disposal technologies in the next Solid Waste Master Plan review scheduled for 2017.

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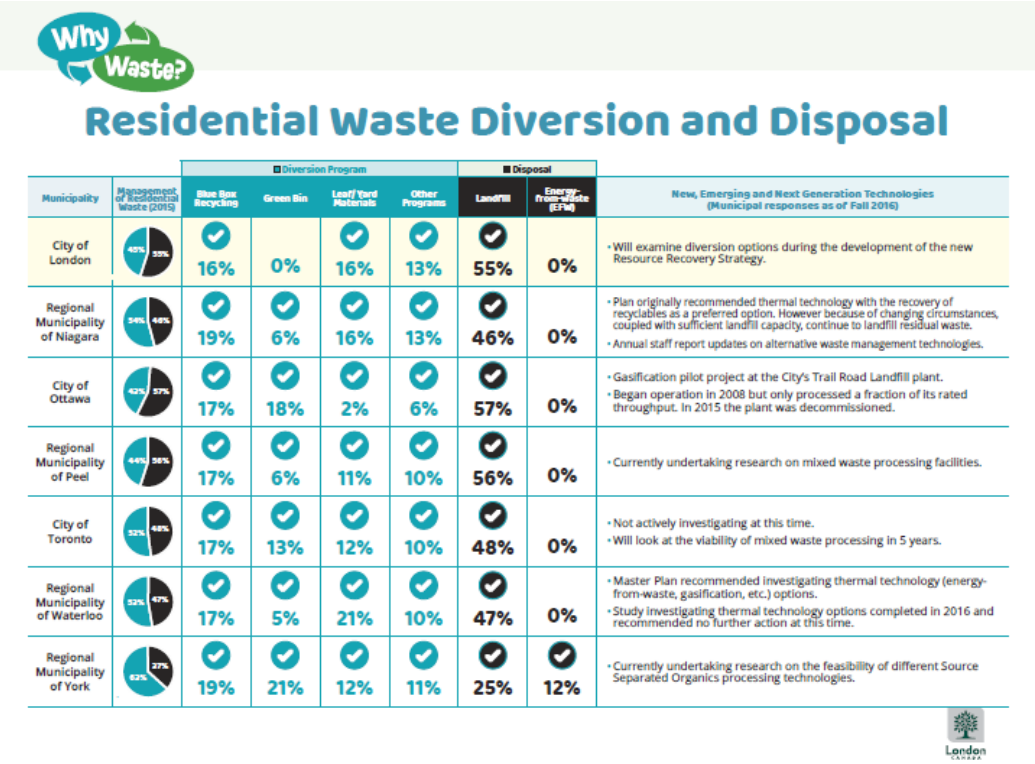

Why Waste?

Residential Waste Diversion and Disposal

Municipality	Management of Residential Waste (2015)	Diversion Program: Blue Box Recycling	Diversion Program: Green Bin	Diversion Program: Leaf/Yard Materials	Diversion Program: Other Programs	Disposal: Landfill	Disposal: Energy-from-waste (EFW)	New, Emerging and Next Generation Technologies (Municipal responses as of Fall 2016)
City of London	45% 55%	✓ 16%	0%	✓ 16%	✓ 13%	✓ 55%	0%	• Will examine diversion options during the development of the new Resource Recovery Strategy.
Regional Municipality of Niagara	54% 46%	✓ 19%	✓ 6%	✓ 16%	✓ 13%	✓ 46%	0%	• Plan originally recommended thermal technology with the recovery of recyclables as a preferred option. However because of changing circumstances, coupled with sufficient landfill capacity, continue to landfill residual waste. • Annual staff report updates on alternative waste management technologies.
City of Ottawa	42% 57%	✓ 17%	✓ 18%	✓ 2%	✓ 6%	✓ 57%	0%	• Gasification pilot project at the City's Trail Road Landfill plant. • Began operation in 2008 but only processed a fraction of its rated throughput. In 2015 the plant was decommissioned.
Regional Municipality of Peel	44% 56%	✓ 17%	✓ 6%	✓ 11%	✓ 10%	✓ 56%	0%	• Currently undertaking research on mixed waste processing facilities.
City of Toronto	52% 48%	✓ 17%	✓ 13%	✓ 12%	✓ 10%	✓ 48%	0%	• Not actively investigating at this time. • Will look at the viability of mixed waste processing in 5 years.
Regional Municipality of Waterloo	32% 67%	✓ 17%	✓ 5%	✓ 21%	✓ 10%	✓ 47%	0%	• Master Plan recommended investigating thermal technology (energy-from-waste, gasification, etc.) options. • Study investigating thermal technology options completed in 2016 and recommended no further action at this time.
Regional Municipality of York	62% 27%	✓ 19%	✓ 21%	✓ 12%	✓ 11%	✓ 25%	✓ 12%	• Currently undertaking research on the feasibility of different Source Separated Organics processing technologies.

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Why Waste?

Resource Recovery Strategy

To maximize waste reduction, reuse, recycling, composting and resource recovery in an economically viable and environmentally responsible manner

Key Project Parameters:

60% residential waste diversion by 2022

New organics management program(s) key method to reach 60% residential waste diversion

Look at the possibility of allowing neighbouring municipalities to use any new facilities developed by the City, under conditions approved by Municipal Council

Strategy needs to be able to address how future technologies can have a (transition) role in the waste management system, if appropriate

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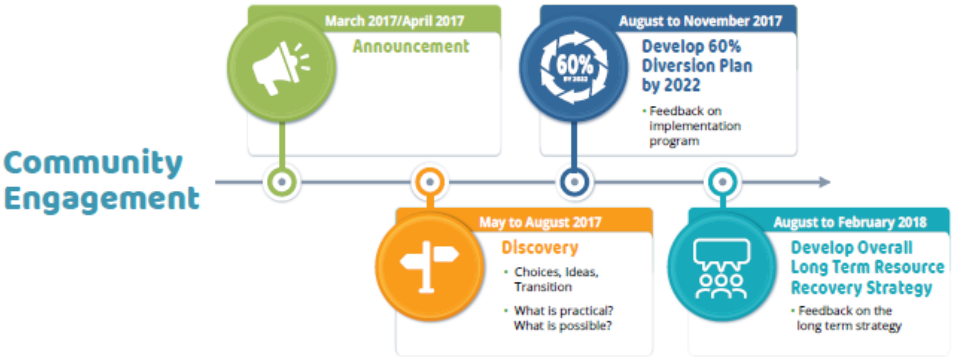
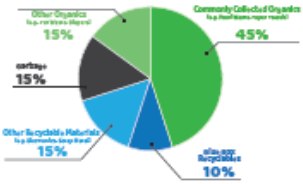
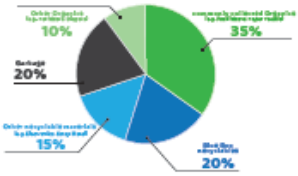
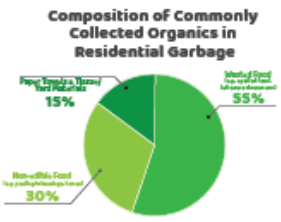
Resource Recovery Strategy Process

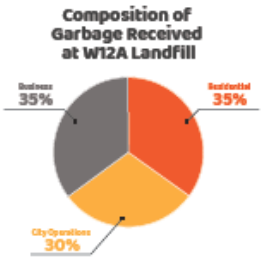


What is in the Garbage (Residual Waste)?









Why Waste?

What Should We Do with Organics?

Food Waste Avoidance

Prevent the creation of food waste

Home Composting

Small scale composting at home

Community Composting

Communal composting in public places or at multi-residential buildings

Source Separated Organics

Green Bin Programs

Facility Separated Organics

Collected garbage is taken to a processing facility to remove organics

Waste Conversion

Conversion of organics (with other garbage) into synthetic gas, biofuel and/or biochar

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Why Waste?

Possible Long Term Resource Recovery Options

Waste Conversion

Thermal or biochemical conversion of waste into synthetic gas, biofuel, biochar, etc.

Requires pre-processing of mixed waste

Energy-From-Waste (EFW)

Incineration of waste creating energy and ash

None or limited pre-processing of mixed waste

Mixed Waste Processing/ Mechanical/Biological

Processing of mixed waste into organic and non-organic portions with recovery of recyclable material (limited)

Organics portion could be landfilled, composted to stabilize the waste prior to landfilling or sent to an anaerobic digester to create biogas and digestate

Non-organic portion could be landfilled or converted to Solid Recovered Fuel (e.g., pellets)

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Photos from Open House 1
May 24, 2017 – Horton Street Goodwill Industries

Photos from Open House 1
May 25 – Lambeth Community Centre

Appendix B3

Community Events

City staff attended public events to promote the Resource Recovery and Residual Waste Disposal Strategies. Events are listed below. Examples of the displays are also included in this Appendix. The display at these events was designed to provide opportunities for attendees to speak directly with City staff. There was no formal feedback process at the events except for the Home Show. (Home Show feedback is summarized in Appendix C.) A common inquiry at all events was the timeline of the implementation of green bins, as well as general recycling inquiries and general composting inquiries.

Community Events

Event	Date	Location
London Home Show	January 26 - 28, 2018	Western Fair District
Neighbourhood Service Days	August 28 - September 1, 2017	Crouch Neighbourhood Resource Centre, Northwest London Resource Centre, Glen Cairn Community Centre, Family Centre Argyle, Westmount Family Centre
Gathering on the Green 2	August 20, 2017	Wortley Village, The Green
Forest Festival	August 19, 2017	Harris Park
Inspiration Fest	July 23, 2017	Wortley Village, The Green
Home County Folk Festival	July 15 to July 16, 2017	Victoria Park
Sunfest	July 6 to July 9, 2017	Victoria Park
Sesquifest	June 29 to July 2, 2017	Downtown London
The Big Leak: Water Brothers	June 5, 2017	Central Library
Gathering on the Green	June 3, 2017	Wortley Village, The Green

Community Event Displays

London Home Show January 26 – 28, 2018

Gathering on the Green 2 August 20, 2017

Sesquifest June 29 – July 2, 2017

Appendix B4

Other Engagement

Various public and City committees and groups have been advised of on-going activities and their opinions solicited as and when appropriate. The Advisory Committee on the Environment (ACE), the Agricultural Advisory Committee (AAC), the Environmental and Ecological Planning Advisory Committee (EEPAC) and W12A Landfill Public Liaison Committee (PLC) are all regular City committees and groups who have been advised of the status of this project. Details of meetings where the Resource Recovery Strategy or 60% Waste Diversion Plan have been discussed are provided below:

ACE

Date	Discussion Topic
February 7, 2018	• 1st Report of the Waste Management Working Group received.
September 6, 2017	• 2nd Report of the Waste Management Working Group received.
June 7, 2017	• 1st Report of the Waste Management Working Group received. • ACE gave their support for both the Residual Waste Disposal and Resource Recovery Strategies.
May 3, 2017	• Early Stages of the Residual Waste Disposal Strategy (Including Environmental Assessment for the expansion of the W12A Landfill) and the Development of the Resource Recovery Strategy.

EEPAC

Date	Discussion Topic
January 18, 2018	• Overview of potential organics programs as part of 60% Diversion Action Plan & Resource Recovery Strategy
June 22, 2017	• Update on Residual Waste Disposal Strategy and Resource Recovery Strategies

W12A PLC

Date	Discussion Topic
April 19, 2018	• Residual Waste Disposal Strategy and Resource Recovery Strategy Update #3
February 15, 2018	• Update and discussion about the Draft Proposed Terms of Reference
December 7, 2017	• Update on Open House #2
October 19, 2017	• Update about the CLC

August 17, 2017	• Displays for community engagement, upcoming Open House in November
June 15, 2017	• Residual Waste Disposal Strategy and Resource Recovery Strategy Update #2 • Feedback from Open House, CLC update
April 20, 2017	• Residual Waste Disposal Strategy and Resource Recovery Strategy Update #1 • Reminder of Social on May 5, Open Houses May 24 & 25

The Waste Management Working Group (WMWG) is a new working group of Municipal Council consisting of five councillors and the Mayor with the purpose of monitoring and advising on activities related to the Resource Recovery Strategy and Residual Waste Disposal Strategy and EA. This is intended to provide a more effective and focused structure for members of the Civic Works Committee and Municipal Council to review, provide input and approve the necessary actions for the successful development and implementation of both Strategies. Details of meetings where the Resource Recovery Strategy or 60% Waste Diversion Plan have been discussed are provided in the table below:

Date	Discussion Topic
March 8, 2018	• Progress Report #5: Community Engagement Program • Background Report #3: Development of 60% Waste Diversion Action Plan
January 18, 2018	• Update Report #8: Programs, Projects and Provincial Activities that will Inform and/or Influence Strategies • Progress Report #4: Community Engagement Program
September 28, 2017	• Decision Report #4: Guiding Principles - Resource Recovery and Residual Waste Disposal Strategies • Update Report #5: Programs, Projects and Provincial Activities that will Inform and/or Influence Strategies • Update Report #4: Community Engagement Program
June 27, 2017	• Progress Report #1: Community Engagement Program • Update Report #3: Project Timelines Update Report #2: Programs, Projects and Provincial Activities that will Inform and/or Influence Strategies
January 19, 2017	• Decision Report #3: General Framework for the Community Engagement Program for the Resource Recovery and Residual Waste Disposal Strategies as Part of the Environmental Assessment Process • Decision Report #1: Draft Guiding Principles - Resource Recovery and Residual Waste Disposal Strategies • Update Report #1: Resource Recovery Update

A new Waste Management Community Liaison Committee (CLC) was also struck for this project consisting of representatives from waste management companies, small business, community groups and members at large. Details of meetings where the Resource Recovery Strategy or 60% Waste Diversion Plan have been discussed are provided in the table below:

Date	Discussion Topic
February 26, 2018	• Community Engagement Update including results of Open House 2 and Home Show • Update Resource Recovery Strategy (Between November 20, 2017 and February 23, 2018) • Next Steps – Resource Recovery Strategy
November 20, 2017	• Updates - Resource Recovery Strategy (Between October 16 and November 20, 2017) • Next Steps – Resource Recovery Strategy • Discussion of getting to 60% diversion
October 16, 2017	• Updates – Resource Recovery Strategy (Between June 5 and October 16, 2017) • Next Steps – Resource Recovery Strategy • Discussion of community involvement
September 13, 2017	• Group discussion on Key Project Parameters for Residual Waste Disposal Strategy including achieving 60% diversion by 2022
June 5, 2017	• Updates - Resource Recovery Strategy (Between March 30 and June 5, 2017) • Next Steps - Resource Recovery Strategy

Appendix B5

Project Website

The Resource Recovery Strategy webpage is published on the getinvolved.london.ca website. It was launched on March 24, 2017. There have been over 4,000 unique visitors to date with over 6,000 visits. This webpage has also been used to promote Waste Reduction Week. Visitors have the opportunity to learn about the Resource Recovery Strategy, provide feedback and subscribe to a mailing list to receive updates. Some examples of the content can be viewed below.

Home / Resource Recovery Strategy

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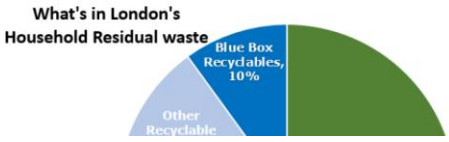
Background

In London more than one tonne of waste is produced per person. This includes waste generated at home as well as waste generated by businesses. Much of this waste is diverted through numerous waste reduction, reuse, recycling and composting programs. The waste that remains can be considered "Residual Waste". All of the Residual Waste from households and a portion generated by businesses is disposed of at the City's W12A Landfill Site. This landfill opened in 1977 and is expected to reach capacity in 2025 based on the current amount of waste being received.



Upcoming Events

Thursday 12 April 2018
Stay tuned!

Resource Recovery Strategy Timeline

Project Start
March 2017

Establish Waste Management Community Liaison Committee
April 2017

Home / Resource Recovery Strategy

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Waste Diversion in London and Ontario (2014)

- London's overall (residential and business) waste diversion rate is about 55% above the provincial average.
- London's residential waste diversion rate is well above the average rate (about 18% higher) compared to other Ontario municipalities without a Green Bin program.
- London's residential waste diversion rate is a little below (about 6%) the average rate for all municipalities.
- London's residential waste diversion rate is about 15% below the average rate for municipalities with Green Bin Programs.

Waste Management in Large Ontario Municipalities

Check out the residential waste management systems in the largest municipalities/recycling authorities in Ontario to see how they compare to London's waste management system. Information is provided on the municipalities demographics, amounts of waste diverted through various methods/programs and their long term plans for waste management. London will also be looking at other high performing municipalities such as Markham and Peterborough when developing its resource recovery strategy.

Select a municipality below to see a summary of their waste management system.

Upcoming Events

Thursday 12 April 2018
Stay tuned!

Resource Recovery Strategy Timeline

- **Project Start** — March 2017
- **Establish Waste Management Community Liaison Committee** — April 2017
- **Open House # 1** — May 24 and May 25, 2017
- **Open House # 2** — November 29 and November 30, 2017
- **Community Engagement** — Spring 2017- Spring 2018
- **Circulation/Approval of 60% Diversion Action Plan** — June 2018 – July 2018
- **Circulation of Draft Strategy** — August 2018 - December 2018

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Take our Food Waste Survey

Complete our Food Waste Survey for a chance to win one of four $25 gift cards to a local grocery store.

Chance to win!

What Do You Think?

See what others are saying and let us know what you think.

Virtual Open House

Virtual Open House feedback results coming soon.

Draft Guiding Principles - Feedback Results

Upcoming Events

Thursday 12 April 2018
Stay tuned!

Resource Recovery Strategy Timeline

- **Project Start** — March 2017
- **Establish Waste Management Community Liaison Committee** — April 2017
- **Open House # 1** — May 24 and May 25, 2017
- **Open House # 2** — November 29 and November 30, 2017
- **Community Engagement** — Spring 2017- Spring 2018
- **Circulation/Approval of 60% Diversion Action Plan** — June 2018 – July 2018
- **Circulation of Draft Strategy** — August 2018 - December 2018

Home / Resource Recovery Strategy

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Committee Reports - Civic Works Committee

First Report of the Waste Management Working Group
PDF (762.45 KB)
February 7, 2017 meeting of the Civic Works Committee, Item # 10a

Update and Next Steps – Resource Recovery Strategy and Residual Waste Disposal Strategy as Part of the Environmental Assessment Process
PDF (1.61 MB)
February 7, 2017 meeting of the Civic Works Committee, Item #10

Establishment of a Waste Management Working Group
PDF (41.03 KB)
December 5, 2016 meeting of the Strategic Priorities and Policy Committee, Item # 2

Individual Environmental Assessment Long Term Solid Waste Resource Recovery & Disposal Plans
PDF (256.76 KB)
October 6, 2015 meeting of the Civic Works Committee, Item # 14

Committee Reports - Waste Management Working Group

Background Document #1: Overview of Individual Environmental Assessment (EA) Process
PDF (90.67 KB)
January 19, 2017 meeting of the Waste Management Working Group, Item #3

Update Report #1: Resource Recovery Update
PDF (179.53 KB)
January 19, 2017 meeting of the Waste Management Working Group, Item #4

Decision Report #3: General Framework for the Community Engagement Program for the Resource Recovery and Residual Waste Disposal Strategies as Part of the Environmental Assessment Process
PDF (105.59 KB)
January 19, 2017 meeting of the Waste Management Working Group, Item #7

Upcoming Events

Thursday 12 April 2018
Stay tuned!

Resource Recovery Strategy Timeline

- **Project Start** — March 2017
- **Establish Waste Management Community Liaison Committee** — April 2017
- **Open House # 1** — May 24 and May 25, 2017
- **Open House # 2** — November 29 and November 30, 2017
- **Community Engagement** — Spring 2017- Spring 2018
- **Circulation/Approval of 60% Diversion Action Plan** — June 2018 – July 2018
- **Circulation of Draft Strategy** — August 2018 - December 2018

Home / Resource Recovery Strategy

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Types of Information You Wish to Receive:

- [ ] Community Engagement Events (e.g. open houses)
- [ ] Online Engagement Opportunities (e.g. online survey)
- [ ] Ongoing Updates
- [ ] City Committee Meetings (when strategy is on the agenda)

Projects You Wish to Receive Information on:

- [ ] Residual Waste Disposal Strategy
- [ ] Resource Recovery Strategy
- [ ] Both

Submit

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Appendix C

Community Engagement Feedback

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Comments from getinvolved.london.ca April 12, 2017 to June 18, 2018

Q – What do you think? [about the Resource Recovery Strategy]

- Work closely with grocery store and food producers to use a different waste stream for organic waste like composting . Create large composting bins for apartment buildings that won't have a smell and is easily accessible.. like composting gardens
- The ACE Subcommittee is meeting this evening to discuss the draft plan, with a particular focus on organics aspect of waste diversion.
- We do a good job now; keep on making incremental improvements. But NO GREEN BIN! Not Ever! Too expensive; small bank for a big buck!
- A composting program is essential (whether a green bin or other type of program) when the majority of waste is organic material.
- 45% of Londons waste is organic. Can those with yard space be encouraged/motivated to compost and reduce the cost of a green pickup?
- Detached homes can and should be encouraged to compost at home.
- A green bin program should be implemented for all multi unit buildings
- All food service locations should have a green bin pickup.
- Options already available for homeowners to compost but don't. Green waste like Durham can save landfill and has resale value at other end.
- Put a giant blue bin beside every garbage bin in the city; make it easier to recycle what we consume on the go than it is to throw it away.
- Lived in Brampton and used the green bin. I would like to see that in London also. More people likely to use green bin than compost at hom
- I lived in Hamilton in 2006 when they implemented a green bin. It reduced our household waste in half. London needs this!
- How can we stop repairable or good things from being thrown to the curb because it's easier? Some ideas here: https://tinyurl.com/y9x28x8c
- I just moved from the GTA where we've had our compost picked up weekly, for over five years. It's disappointing to see London so far behind.
- Website should show a detailed pie graph of the current recycling figure of 45%, followed by updates to see what plans are working best.
- everything that comes out of a grocery store should be Recycled, Reused or Composted and picked up at the curb by the city, in provided cans
- Agree with the other comments. Should have organic compost pick-up as part of a full composting plan and engagement strategy.
- London has a unique advantage to use existing organic waste treatment facilities where organic waste can be diverted to reach goals b4 2022.
- We have Orgaworld here in London * Where green bin waste is processed *so, why isn't the program implemented in our city too?
- I moved to London from the Niagara Region in 2015. I was shocked there was no green bin system here! Would be thrilled to see this happen.

- This is KEY: “How can we stop repairable or good things from being thrown to the curb because it's easier?"
- Encourage reuse of unwanted items: https://www.bristol2015.co.uk/method/resources/
- would love to have green bin program...sister lives in Hamilton...everything goes into compost bins...great idea
- To encourage home composting, the city could consider a composter give away or sale at discounted price. Waterloo did this years ago.
- Why hasn't the City provided black bin composters for residents at a discounted price (we have 3 we use)?
- Organic waste pick up important. It takes 25 years for a head of lettuce to decompose in a landfill.
- Would love to see the green box program here in London. We do compost and recycle a lot. Most of our throw away garbage is food stuffs.
- I am concerned with ppl not using a green bin properly and increasing the amount of skunks, mice, raccoons and rats. Too many already!!!
- Shocking that London is surrounded by Municipalities that have Green Box programs and yet London doesn't. Embarrassing really.

Feedback on Second Round of Questions. Questions posed at Open House 2, online, London Home Show and to the Waste Management Community Liaison Committee. The number of responses varied by question, but ranged from 615 to 956.

What Level of Investment Are You Willing to Make?		**Response**	**Summary Comment**
Greater levels of waste diversion and resource recovery will require additional financial investments. On a household basis, how much more in municipal taxes and fees would you be prepared to pay per year?	$0	17%	Over 80% of the respondents indicated they are prepared to pay more for waste diversion.
	$1 - $25	44%	
	$26 - $50	24%	
	$51 - $75	7%	
	$76 - $100	8%	

Potential New Programs and Initiatives (including the approximate annual cost per household)		**Level of Support**	**Summary Comment**
Food Waste Avoidance	No change: $0	16%	Almost 85% support for some kind of program.
	Moderate Program: $1	46%	
	Significant Program: $7	38%	
Home Composting	No change: $0	25%	

	Moderate Program: $0.75	38%	75% support for all proposed options
	Significant Program: $1.20	37%	
Community Composting	No change: $0	20%	80% support for all proposed options
	Low Tech, Private: $0.01	25%	
	Low Tech, Public: $0.15	28%	
	High Tech, Public: $0.45	27%	
City Wide Organics – Curbside Program	No Change: $0	19%	Stronger support for Green Bin. Green Bin also preferred by CLC and ACE.
	Green Bin Program: $20	62%	
	Mixed Waste Program: $40	19%	
City Wide Organics – Multi-Residential Program	No Change: $0	17%	Stronger support for Green Bin
	Green Bin Program: $7	61%	
	Mixed Waste Program: $14	22%	
Other Recyclables (people could choose more than 1 option)	No change: $0	16%	About 15% do not support recycling other materials
	Carpet: $0.30-$0.80	30%	
	Mattresses/Box Springs: $3-$6	37%	
	Wood Furniture: $0.05-$0.50	25%	
	Electrical Equipment: $0.10-$0.60	34%	
	Textiles: $0.00-$0.60	21%	
	Bulky Plastics: $0.01-$0.40	29%	
Other Waste Reduction Initiatives (people could choose more than 1 option)	Lending Libraries: $0.25-$0.50	34%	Between 30% and 40% are supportive of various waste reduction initiatives
	Repair Workshops: $0.25-$0.50	35%	
	Promote Reuse Events: $0.25-$0.50	41%	
	Waste Reduction Education/Outreach: $0.55-$1.10	32%	

Waste Reduction Policies & By-laws (people could choose more than 1 option)	Expand and enforce material bans	31%	Between 15% and 30% are supportive of various waste reduction policies and by-laws
	Clear bags for garbage	19%	
	Reduce garbage container limits	23%	
	User pay (pay per bag or container)	17%	
	Performance-based incentives	24%	

Comments from Home Show January 26 – 29, 2018

Q – Do you have any other suggestions, comments or concerns for our consideration in the development of the Resource Recovery Strategy?

- Communal compost for complexes or condos
- Bring in green bins
- Citizens young and old need to be encouraged to stop littering! This was identified in the 1960's as a problem and now it is very problematic. I take a plastic bag to collect in my area. Have brought loads back as garbage and recycle material.
- Green box program PLEASE!
- Use the organic waste plant south of London
- Need to engage corporations and property management firms in the development process to increase buy-in.
- I have generally seen a reluctance to use green bins in 50% of my neighbours in other cities. Love the ideas of options for all types of bulky recyclables.
- Mirror Guelph's program
- Collect compost by city to reduce costs
- Green bin programs already in other cities in GTA should be implemented here too.
- Education. Training. Regular feedback from community by various means.
- Food waste recycling is long overdue in London. All of the suggestions on the boards are great!
- Clean and green!
- Policies enforcement! The impact to the overall system needs to be examined. Going to performance based incentives will not be successful.
- More electric chargers
- Would love to see the food waste program here in London
- Have recycling contractors follow current recycling strategies
- Green bins for composting
- Community give away day (Guelph & Winnipeg do it). 1 day residents can put all items @ curb for neighbours to come & claim & reuse
- Use hybrid garbage trucks
- Community composting for neighbourhoods

- Reinstitute the spring clean up program where old building materials etc could be put out on a given date. Often recyclers drove by and put old doors, lawnmowers, scrap to use. Crack down on student neighbourhoods.
- Program for organic waste.
- We have a roll out cart in Nova Scotia bi-weekly pick up – compost & garbage & recycling next wk. incl. meat, bones, lobster shells, (we freeze until pickup for bears, raccoons etc.) Need a similar program in London
- Green bin & recycling collection weekly with garbage in clear bags is biweekly. Another home composter campaign to incentivize homeowners to compost. Community events with compost/soil tests with professional to advise on use at home
- I think it's a great idea. It will impact people financially, but it is slight and if there are incentive plans introduced, it will be more attractive for community involvement.
- I would like to know how businesses are contributing - What they all doing to reduce 1X plastic use. HOW DOES TIM HORTONS get away with NOT being responsible for all their cups in the garbage??!?
- Please supply blue bins to promote recycling rather than having people throwing things out. A green box program would be very beneficial.
- Compost! Take Tech – get green Bins!
- Bottle & can deposits such as used in UK. They have 90%+ recycle. Set up machines in grocery department stores use ticket to pay for necessities. Too much focus on low incentives.
- I'd like to see a youth focused summer program to repair household appliances brought in by the public (a repair depot) – too much gets trashed unnecessarily. AMO needs to pressure the food and consumer goods industries to reduce packaging
- Please don't spend too much. Educate the children in grade schools. In high schools – set up programs for kids to do resource recover for 30 community service hours.
- Start accepting Styrofoam containers. Offer free composters for backyard.
- Green bins would be great!
- Encourage businesses (with financial incentive) not to over package their goods
- This is not an economic issue it is an education issue – People need to think "garbage" when they are shopping – Have a "think garbage" campaign
- Educate public on not purchasing anything in packages that are unnecessary e.g. cookies
- Have free green bins and blue bins and one free garbage bag. Charge for extra.
- Limit ban or educate on the horrors of one use plastic.
- Garbage pick up every two weeks.
- Educating the public on environmental effects, plus means of saving residents money would/could help encouraging recycling/reducing waste
- More instructions or public ads school programs may help
- Curbside pick-up of special materials (paint, electronics etc) once/year?

- Focus on re-use & reducing plastics
- Incinerate
- Paint containers
- Need more depots available for toxic waste
- We should be able to bring our paint cans (not empty) to the recycling sites
- Green bins!
- Paint cans
- Dirty oil after an oil change
- I don't agree with charging $1.50 per bag when we already pay for garbage services in our taxes
- Styrofoam yes
- Sod tires mulch for sale
- Green bins a must
- Green bins 4 sure!!
- Green bins
- Styrofoam! Plastic grocery bags! Kleenex/napkins!
- Styrofoam is an issue & should be recycled
- Compost bins free
- Recycle days for electronics, more compost bins
- More awareness & instructions on what to do and make it convenient
- More frequent in the summer (smell). Any improvement is good.
- User pay works best
- Educate/advertise people to sort
- Move to weekly green bin & bi-weekly recycling & garbage
- User pay is a great system. Household composting should be mandatory.
- Don't sell our landfill space to other municipalities
- Stop letting others put garbage in our landfill – London only
- Great education. I like the idea that diversion is so effective
- How about tax reduction incentive for seasonal people
- Recycle Styrofoam
- Provide rebate to homeowner for full composting home units to prevent so much garbage. Police non users of blue box programs. Green bin is a good option. More yard waste pick up days.
- All great ideas! We need to Reduce, Reuse, Recycle Much More
- Green bin
- Performance based incentives too costly to implement
- Recycle plastic grocery bags!
- For sure an implementation of by-laws – more education at the elementary school board e.g. litterless lunches. Keep at it! We have to stay strong & keep educating. We cannot be like out American neighbours.
- Green boxes soon! Rain barrels

- Same garbage day every week
- The message needs to mean something to each person, how will it affect/improve/impact my quality of life – large numbers, population statistics not as helpful for personal accountability
- Encourage more composting of organic materials
- Educate the children in school – high school. Set up programs for high school kids to get community service hours
- Would like to see London move to organic recycling ASAP
- Give me a recycle bin please. It's ironic that we used 3 pieces of paper and paper ballets to complete this game
- Waste – green
- We need to expand plastic recycling program and kitchen waste
- Educate those who are not clear about value of recycling and waste reduction. More recycle bins at parks & other public facilities.
- I have relatives who have use the green bin curbside collection result in an infestation of mice in their community. Keeping costs down will garner support
- Questions with restaurants throwing recycled waste in regular waste… why?
- Need to promote organic recycling – teaching/pub ed. Well handled – there will always be critics
- More compost incentives. Give compost bins free currently pay over $6K in taxes. Prior to incurring increases in taxes and fees I would like the City to demonstrate enhanced efficiencies within the current infrastructure.

Comments from Facebook post December 22, 2017 requesting feedback on possible options to handle organic waste, alternative landfill design concepts and proposed studies to evaluate the alternative landfill design concepts.

- Just learn from other cities. You don't have to reinvent the wheel.
- I heard a rumour that compost bins were purchased under Fontana but plan wasn't implemented Again? Just get it done this has been an embarrassment to London for over a decade

Comments from Open House 2 (questions from Comment Book) and virtual Open House

Q - Do you have any other suggestions, comments or concerns for our consideration in the development of the Resource Recovery Strategy?

- Stop free pick up of furniture. Wooden furniture needs to be broken down at dump and put in wood bin.
- Two free garbage tags should go with the annual garbage calendar.
- This could be a showpiece for London in so many ways.
- I think individuals should get more involved with there own garbage.

- Think about the City getting out of the “garbage collection” business [long term - hard sell]. Then everyone would have to deal with their own garbage and be aware of what they generate. Only collect recyclables. Alternative collection method – private contractors or do it yourself.
- Clear bags, textile recovery, organics diversion, food waste education
- Strongly support thermal or conversion of waste incineration!
- Need to look at what other cities and countries are doing ie ban plastic bags, zero waste stores, packaging bans etc, more bulk facilitation, restaurants need to be on board too (waste going to dumpsters, have more recyclables products, ban straws and disposable napkins. The public needs to be more informed about recycling rules and composting options and how to’s. I heard on the radio about Oxford County’s Green Cone. I went to their website and learned about it. I looked on London’s website and saw that we have them! Why didn’t I know about it? Why do so many people I know, not know how to recycle properly? No one seems to care. There are tons of visuals and ideas on social media that could be utilized. We can do this!
- Allow all plastics and metals, not just packaging. Only allow containers, no bags at the curb.
- No it is not worth. Landfill is easy to fill up and cause many problems (Full, communities take advantage). I think recycling and garbage processing plants will help our environment and economy. Jobs in recycling and garbage processing plants sort all materials and put many different kinds of materials before they go to recycling plants. Lot of people throw lot of black garbage bags into the bins and containers. They never put recycling materials into the blue box or blue containers. They are lazy and uncare. Enforcement is best way to inspect them. I want to increase toward 100% near future. 60% is OK but it is not enough to take recycling materials out of garbage. Fair is best way to deal the fair sharing price.
- Be creative. This can create many jobs also. Also make land a leader in waste recovery.
- Many of the program will create jobs. Not only at the collection and sorting side, but also afterwards with the people working with the reused materials.
- More open houses regarding up to date results
- No green bins! Way too expensive for taxpayers. Just expand the landfill as required.
- Pick up on one side of the road only (not arterial roads) to limit air pollution from garbage and recycling trucks.
- I think for the amount more you’re being asked to pay a substantially higher amount of garbage is being diverted making it worth while.
- [many items proposed to add to recycling program] are recycled through Goodwill etc.
- We were told that we could no longer use plastic bags for leaves to save 300K in extra charges to city. Instead you have added $5-15 per household to buy paper (fall apart) bags for leaves and did not reduce our taxes by the equivalent 300K.

- I would select user pay (all) to work in conjunction with a reduced container limit (perhaps pay per additional bag) and clear bags, bans and incentives
- Include info as to relative cost to London households compared to other municipalities. What do I pay now? What do residents pay in comparable municipalities? Really want a green bin program with bi-weekly pick up for regular waste

Comments from Facebook post Nov 26/17 advertising Open House 2

- we need to put some of the responsibility of waste back on the manufacturers..they need to use less packaging or pay municipalities to recycle or dispose of waste.
- Composting!!!! Give us green bins!!! We are so damn behind in this city, environmentally speaking (among so many other ways we're behind the times). But I've been pushing this city for household green composting bins for nearly a decade. Make it happen!!!!
- You can't get a representative sample of opinions by requiring people to show up in person at a handful of events. Your results are going to be skewed in favour of people who are in town, work compatible hours, are not single parents, etc.
- How about spending some time trying new ways to engage with people, and understanding the bias each introduces?
- don't need it...we already have 3 blue boxes and 2 composters. People have to be sensible and do it on their own. I wonder if I don't take the green bin will they give me a reduction in my taxes?.....hahahahahah
- I'd like the green bin which would reduce garbage. I also think manufactures should reduce extra packaging that isn't necessary. No products should be in the grocery store that can't be recycled. Please give us a garbage pick up where we have the same garbage day each week, like all other cities. We pay enough taxes and we do need a weekly pick up.
- Yes please to the composter idea Also can we please have bigger blue bins? We have 2 Metro bags full of garbage each week. And we put them into a black grabage bag for pickup. With the green bin means less for us a week
- There are alot of apartment buildings in London-bet they could use some help and support to increase recycling, we need an easier method of recycling plastic film rather than taking it to stores, we need to do more recycling of fabrics and fiber that is not good enough for resale
- I remember paying "environmental disposal fee" when buying electronic items. Does anyone know where that money went?
- Hey a green bin program going. London is one of a very few that doesn't do organic waste and it's embarrassing such a progressive city is so far behind in this regard
- Need use of various bins - waste, recycling and green bins which are then self limiting due to size.
  Also automated emptying into garbage truck reduces labour , health costs etc.

- I feel sorry for all the residents who live near Orgaworld. The stench around that facility is unbelievable. For that reason, I will not participate in the green program.
- And the City will ignore all these ideas....oops, it's London and BRT is going to fix all the issues don't ya know!
- I already give you $520.00 free labour every year for recycle pay taxes for garage pick up and by things with less package do reduce problems making the stuff now put leafs etc in bags to pick up which cost me money for composts that you put in areas where people who do not have cars can't get any now you want food scraps saved put out that smell and attracts animal bugs at my expense dream on
- teach your employee is how to pick up the garbage first,,not leave it all over our lawns
- Green bin idea brought to you by the Trash Panda lobby of London.
- An online survey would be great for the people who cannot make it to a meeting!
- Incineration and put some hydro back into the grid!
- why don't you people talk to Calgary Alberta they have all this covered out there and have for year
- I loved the green bin program when I lived in St. Thomas.
- Where are the green bins?!! I have one and it sits idle here in London.
- The city back in the 90s gave composting bins to everyone who wanted one. Do that again.

Comments from Facebook post September 12, 2017 requesting feedback on the Residual Waste Disposal Strategy

- Everyone should have a fire pit in their backyard to burn all the plastic trash they have
- Green bins have been an option for years but several city councils, including the current one, have waffled on this because of cost. What does a new landfill cost? Stop waffling and make the tough decisions!
- How about supporting/ encouraging (eventually forcing?) businesses to recycle too? My understanding is that at least some businesses do not recycle, including some large office blocks downtown. These places only produce a subset of waste "types" which currently go to landfill, yet could be easily diverted to provide massive gains in terms of landfill space very quickly.
- Green bins! I have four children, two in diapers and I recycle everything I can. I compost all of my food items and our household usually only puts out 1 garbage can a week.
- Federal regulations restricting the over packaging of ALL goods, imported and domestic, from food to toys, as well as requiring that any packaging used be biodegradable.
- We need organic waste pick up. Toronto has had it for 12 years, St. Thomas too. How do we raise our children to reduce, reuse, recycle if we as a city don't???

- I moved to St. Thomas a couple years ago, and it's like a paradise here for waste! In London I recycled and still had 4 large bags every 8 to 11 days for pickup in a 2 person house hold. Here we have the green bin and I put out only 1 bag every Wednesday. London should take the lesson.
- Need green bins, to much organic waste is going landfill when it could be turned into compost. Lots of food service business could greatly benefit from this.
- Look at the Norwegian/Swedish? Model where they incinerate. Could the incinerator at Westminster Campus be resurrected, technology has come so far and maybe there is a solution to the problem that shut it down. These countries have nearly 0 trash going to the landfills. Please check it out.
- I sat on the waste advisory council in Orillia, as well I co own a business providing effective waste reduction solutions to businesses across London and beyond. If there was an opportunity to meet with st...
- Green bins for sure! I also think there should be a deposit charged on pop cans, bottles, tetra packs, etc and locations (i.e. Grocery stores) to return them for the credit. I think this would help reduce what goes to landfill. Unfortunately a lot of people don't care and won't recycle unless it hits their wallet!
- Shouldn't we try to know what's filling the dump so quickly (besides the obvious answer of 'garbage')? Once we know that, figure out a way to reduce those top items.
- Pleasantly surprised at the comments this time around. I'm used to most Londoners complaining about a bag limit. I have a family of five and we put out a chip-bag sized bag every week. Move to zero-waste and compost. I also collect things like plastic bags that aren't picked up and take them to the grocery stores (yes they take that plastic film!) glad to see so many people on the zero-waste /green bin wagon
- Encourage more recycling and let us recycle more items! Lots of items London does not recycle.
- Encourage people to donate items and not throw them away (lots of places have drop off or even pickup)...
- There is a company in Atlanta Georgia that drills holes into the ground at the landfill. By letting the air reach the waste in the ground it breaks down faster and extends the life of the landfill. Was brought up about 15 to 20 years ago, but London said no. Could this be a solution now maybe.
- "If you think your waste being burned is a good thing then you are more inclined to just chuck things away rather than recycling them."
  The last few weeks there has been alot of discussions about global warming and along with that, talks and news about...
- We need to move to a zero waste society. Get rid of the one time use products. Products that we do use should be biodegradable. Green Beaver Co, bamboo toothbrushes, aka cat litter can be composted reusable produce bags, reusable sandwich bags.
- As part of the short lived pilot for green bins I can attest that our waste was cut in half when we had a green bin. Bring them back!

- Our landfill would be perfectly fine if half of it was not filled by garbarge from Toronto, time for Toronto's mayor and council to start thinking about dumping their city's waste in landfills in their own city, not ours.
- We also need to look at recycling every bit of plastic out there, soft plastic, hard plastics from things such as plastic furniture, gardening pots, etc. Aim for 0% plastics, metals and food in landfill. More recycling please.
- One idea is to consume less...buy less stuff. If an item has a lot of packaging...don't buy it. Composting in your backyard is very easy if you have a small amount of yard. People need to take more responsibility for the waste they produce.
- how about stopping companies from over-packaging goods? maybe it's time to take all the extra plastic and cardboard and let the companies pay to dispose of it instead of the taxpayers?
- So work with the Canadian gov to make a garbage burning electricity producer like they have in bc kill 2 birds with 1 stone. Also create jobs.
- Buy quality products and you will spend and waste less.
  Support businesses that up-cycle and recycle.
  Return products that fall apart before their time. Businesses need to offer quality, long lasting products and this is the only way to get them to stop offering stuff that clutters up the landfill.
- Other city's have had green bins for years .... It's proven to be successful ... It's an absolute embarrassment that the city of London still doesn't offer this program ....Send just 1 person from London's environmental waste management board to Sweden...
- Out west there is a deposit charged when buying plastic containers such as milk, pop cans etc and are recycling depots to take them back and receive money. This would be a great incentive. Also if we implemented green boxes, it seems to work well for t...
- We were part of the green bin pilot program and it diverted 2/3 of our garbage otherwise going to the landfill.
  Please bring it back.
- Enforce recycling. Require use of clear garbage bags, if there's recycling in the garbage bags then don't pick it up. I see lots of folks doing zero recycling.
- If the city doesn't recycle styrofoam or plastic bags, why aren't they banned. Also, why don't we have a composting stream? We are light years behind compared with other cities of the world , even other provinces.
- Why is London not using green bins. Our pickup of black bag garbage is every two weeks so it forces people to use green bins more. Green bin usage is up 125%!!!!!!
- Get compost bins for people and collecting bins each week. Limit 1 bag of garbage each week. I use to have a compost bin in Ancaster, only had 1/2 bag of garbage each week with a family of 4.
- Travelling in Europe I realized very quickly how wasteful Canada is when it comes to garbage and recycling. For example beer cases come in plastic containers that are

reusable. Water bottles pop bottles are recycled at a machine that takes the recyclin...

- I put out one bag a week. I recycle everything I can. I'd have even less paper recycling if they didn't put out store flyers every week. Waste of our trees. They only need to be out once a month get two of everything every week in the mail box. What a waste
- A neighbour has a doctorate in soy bean insemination with the Fed, this wit if nits simply tosses his trash in the back yard. 100% green except for the wild animal dung, all this would fit with our wacky city council!
- The dump won't get filled up from my garbage this week. Apparently my rubbish bin was "too heavy". Yes, I put 3 bags in one bin because if I leave it at the curb the animals get into it. Simple solution, take the bag off the top and chuck it in the tru...
- The link described as "Quick Feedback" begins with a question containing the following, "The Residual Waste Disposal Strategy, 'including a proposed landfill expansion'..."... For those opposed to future landfill expansion, at any point in time, there ...
- Use of bins as provided by BRA in various municipalities around us or Waste Management as in Florida.
  Restricts garbage to amount per bin size (no argument as to # bags each year on council) and recycle bins easier to use and less blowing around on windy days. Thus more recycling.
  Automated lift truck use and less Workers Comp claims, sick days etc. Less manpower needed.
- How about allowing Styrofoam recycling? Then I wouldn't have any garbage except pet waste (which will compost) since I compost and recycle everything else!
- We live in Orangeville ...we have the green food waste bins, blue bins and we r only allowed one open regular sized can or one clear bag of garbage (that way people can't hide recyclables in their garbage) ...the only time we have anymore waste then a
- Condos & apartment bldgs NEED TO do their part. They still just throw everything down the chute. It's convenient.
  Home owners Should have/ use a compost. My sunny spot is on the front lawn so there it stands. Ugly as all hell But it works. Only garbage I really have ... cat litter Go after apt/condo users.
- What ever you do this plan isn't working. So many dump things into our community bins. The these rude people tell us you F off it's not our business. Plus there are less scrappers on the roads these days. I use to see truck full of stuff/junk. Who would have thought trash and limits could mess things up for everyone. Unless everyone sticks to a program for trash, nothing will work.
- I live next to a "student house" in a single family neighborhood and the volume of refuse is incredible. the three containers they use hold the same as 4 green garbage bags of garbage and there is enough "blue box" garbage" for three households EVERY WEEK .The City of London is blind to any thing caused by UWO and

Fanshawe Collage and deaf to citizens concerns that these posts a lip service and seen as a joke

- Every one should be charged for having their garbage taken. It is coming because people in the country are paying already. Second composting. Have areas around the city where people can take that material. Themselves at no cost to the city. Pay as you ...
- People have had fire pits for years but now it's a money grab for our city councillors. Why can't people burn the paper and cardboard as before. The answer is the city councillors wouldn't make any money. Some people don't have the excess money to pay ...
- Buy items in compostable, recyclable or biodegradable packaging. Boycott the other stuff. Companies need to be responsible as well!
  Any blue bins or green bins need to be clearly labeled with what can go in them!
  And some education on waste reduction would be useful!
- There should be NO fire burns in city limits!! It's awful when you see that "just close your windows" if your neighbour is burning something. Really!! That's stupidity! Why should we be forced to close our windows and turn off our air exchangers just s...
- Until you change shopping habits nothing will change, re-use is the best way. The only reason why pop comes in plastic is the companies decided to do it, go back to glass (give the kids the fun we had trading bottles in for candy) with most people not caring about the environment or caring when suitable we will continue to have waste. A family of 6 needs only two bags trash weekly
- Green bins would be great. Also, being able to recycle styrofoam would help, lots of businesses use styrofoam containers for their take away meals. Perhaps if it can't be recycled, the use of those containers could be phased out.
- Time to start the GREEN BIN Program ... small towns ie. St. Thomas have this program ! London should be ashamed !
- I think the city should have a better Recycling program as I have found since moving to the city that my bin is often left outside because I have put Recycled material in there that the city does not take. Most of my garbage isn't garbage....i would say 80% is and can be recycled but it ends up in the trash because the city wont take it.
- What about the refuse generated from apartment buildings? After just moving into one I can tell you there's a lot of garbage! I miss composting and feel guilty putting kitchen waste in the trash.
- Tell Toronto and other places to look after their own in their community instead of polluting London.
- All the composting, recycling or incinerating in the world won't solve the problem in the long run. Everyone seems so concerned about the world we leave for our grandchildren, but we're just handing down to them a problem we're too bashful to solve ourselves
- We should be burning garbage. Sweden recycles everything possible and burns everything else. They started taking garbage from other countries because they don't have enough of their own.

- How about if we go to all the old land fills and processes the stuff in it ,look at the way London England does it
- Well we recycle, however if my son accidentally doesn't put the right thing in the container such as paper with plastic it is left at the curb with a terse little reminder to put it in the right bin. Than its in the garbage
- In St Thomas any plastic with the recycle symbol goes in the grey bins with the tins and glass
  paper and cardboard go in the blue bins
  compostables go in the green wheeley bins...
- Tackle it from the other end and change packaging practises ... stop production of packaging that isn't biodegradable or glass... change distribution practises... bulk style...? Want less mess to clean up - give less crap to play with. We've got the t...
- allow backyard chickens which people can grow their own chickens and wont have to have egg cartons. ..and be a city which encourages off grit (less dependent on government) and won't have so much garbage.
- Green bins for organic waste. Recycling for downtown businesses.
  Penalties for residents (and students) who don't recycle or leave a house worth of furniture at the road.
- Green Bins, companies MUST recycle, construction materials/furniture/appliances should be RESTORED depots = free to public for recycling and ALL plastics reduced/recycled ALL!
- Every one wants everything easy. Pick up my garbage, pick up my recycling. We would be happy to take all of these items to a location within the city if we had too. Remember when we had the strike a few years ago???
- Quick feedback?
  How can a city continue to grow and not create waste?
  Another food franchise, another factory, another big box store.....????...
- Get rid of disposable diapers, and make bottled water of all shapes and sizes refillable, and include milk, soft drinks, etc. Reduce the packaging of food items.
- GREEN BINS. It's ridiculous that a city this size has yet to introduce these. Like Katie Brown said, get with the times already.
- Start developing Hemp made plastics already.
  We're so screwed.
  I knew it would happen. ...
- you need to incorporate compost recycling pick up like Guelph does - we compost and recycle and only put out, generally, one bag of garbage every two weeks or so.
- Why don't you have what Guelph has 3 bins that food Recycling and garbage bins are better and easier
- We had a solution. It was called the Energy From Waste plant and it was killed by uneducated NIMBYists.
- Residents who reside in a home pay a fee for garbage, and green bins!! Composting saves so much on garbage!

- yup.. keep sinking your money City Of London into BRT....that probably will not be ready by 2025....just sayin.
- How about pay per bag like most other surrounding municipalities....as a former Londoner I now pay per bag household of 4 and we put 4 bags of recycling out which is FREE....and 1 bag a week....you learn quickly to properly recycle and doesn't take any t...
- Buy quality products and you will spend and waste less.
  Support businesses that up-cycle and recycle.
- Years ago, before the Brewers Retail, I took the empty liquor bottles from Robinson Hall to the recycling plant that was taking them at the time. The person there confided to me that there was no market for the glass bottles, so they were just going to...
- Bring back the green bins
- Bring back the green bins it would be a great idea for the citizens of London and the rest of London residents
- I vote green bins! Get with the times already, London!
- Green bins!! How is this not already in place?! ALSO businesses should have recycling pick up!!!!
- How about composting? The city of Pembroke composts. Why can't we? I do it anyway in my backyard
- Recycle more. I am always astounded by the number of garbage bags at the curb
- Please implement the green bin food waste system to reduce waste
- bull and barrel have to dump their wings somewhere
- We need to add the Green Bin.
- Our coop has a strick recycle program
- Thsts because you folks take Toronto's garbage
- We pay you for planning and strategy , why are you asking me. Don't waver my confidence.
- Ah hell, just pile it higher and turn it into a ski hill.
- So... where is our green bin service already?!?
- Green bins! Catch up with other cities!
- Does this include the city dumping their asphalt, concrete, etc? Or just residential garbage?
- So it's not gonna be full until 2025 but you only have the next 10 days to give feedback?
- Energy from waste...oh wait..we had one of those didn't we
- Sounds like someone needs some recycling.
- Let's get with the program..Its all about composting
- Follow edmontons lead, they are the top in the country !
- How about a green bin program?!!!! Isn't it time?
- On site composting, l do it, encourage it, and don't support more fleets of trucks.
- People have been asking for green bins for more than 10 years. It's way past time.

- Shouldn't had let Toronto use it!
- Compost where you live if possible not another fleet of trucks.
- By from bulk food stores to reduce packaging waste
- Yes green bin . Want them to do it here in Stratford too .
- Start packaging with biodegradable hemp plastics.
- More recycling, green bins picked up weekly and regular garbage every 2 weeks! It works great In Oakville. London needs to wake up!
- Send the recycling to China so they can reuse and reproduce stuff like the states do.
- Is this because Toronto has been using the same landfill for a number of years?
- Clear garbage bags made mandatory and ppl charged extra if recyclables are thrown into trash.
- Nursing homes need to compost. Retirement homes need to recycle and compost.
- Compost green bins will reduce waste
- Bring green bins to London!
- I would be happy to see London get into composting. Even in the apartment complexes.
- Might also be an idea for London not to take any more of Toronto's garbage.
- we have many option that the city is not doing so it on them,,also get garbage men to pick up properly
- I want to go zero-waste. Yes, that's a real thing. Ha
- Compost!!!!!! Works great in Markham, why wouldn't here?
- we need to re look at the way we recycle - take a page out of the European's process of recycling
- We must compost our fruit and veggie scraps!
- Green bins!!
- I agree with Green bins
- Green bins please!!!
- Green bin!!!
- Let's make a new ski hill!!
- pile it higher
- Green bins please!
- Incinerators are needed.
- Duhhh find another landfill site ...
- Green bins!
- recycle foam and plastic wrap
- Quit taking Toronto's garbage
- Green bins!
- Need a good waste program!!!!
- Did the survey. Thanks for asking!
- Green bins!
- Green program

- Composting!
- Incinerator
- Compost
- Green bins!!
- RecycleOffer composting

Comments from ES Mail or direct emails

August 30, 2017

When resident first bought her home in the 1980s the city gave out free composters. She had not composted before that but has composted since with 3 units now and composts most yard waste in addition to kitchen scraps. Perhaps an initiative for the city to consider again….

August 25, 2017

I am fairly new to London, and concerned about the amount of household waste we produce, as I had become used to organic waste recycling elsewhere; I had gotten used to having only 1 tiny bag of trash per week. It's shocking how much organic matter we "waste" and I hope to see that change.

I have a question about the information on the city website,
https://getinvolved.london.ca/WhyWasteResource
This page shows a pie graph of "London's Household Residual waste", which shows recyclables at 10 % and 15 % which would be a total of 25%. Scrolling down just a bit, I read:
The Resource Recovery Strategy will identify:
areas of continuous improvement to maximize waste diversion and resource recovery including increasing the current London household waste diversion rate to 60% by 2022 from the current rate of 45%; I am wondering, where does the 45% figure come from, as we do not recycle any of the household organics currently?

Another question I have is: Are there smaller, dated targets to increase this recycling BEFORE the 2022 deadline, to ensure that smaller goals are being met on an increasing basis well before 2022 arrives?

Thank You for any information you can provide on these 2 questions.

July 29, 2017

I find it exciting that London is finally thinking about increasing the recycling. When I moved here my garbage amount doubled from what I was generating in Sudbury. The biggest amount is that you do not have a green box program. The remainder is that you do not recycle everything you can. Styrofoam is the biggest thing I noticed.

It is important that you include the cost of replacing the landfill when you start to pay for a recycling or green box program. Once you take this into account the extra cost becomes bearable.

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It is important that you include the cost of replacing the landfill when you start to pay for a recycling or green box program. Once you take this into account the extra cost becomes bearable.

July 23, 2017

So London Ontario's landfill is expected to reach capacity in 2025!
Are we the ONLY community in Ontario, or could it be all of Canada, that does not have a green bin pick up policy in place??

Out of province and even out of area visitors are shocked that this lack can still exist.
A not to be lauded fact about London the 'Forest City', to be sure.

June 10, 2017

It would be great to have an instagram account and facebook event about the green bin vote. Create a social media frenzy over people's opinion and encourage them to vote and to become aware a vote is even possible! Provide statistics and information on cost both for and against the green bin program and what the alternatives are when landfill becomes full Attend more events. The event you attended at Gathering on the green did not expose that a vote or opinion was needed on the green bin program. There was a great board about clotheslines and getting people curious about it but there was no display of a green bin or any information to suggest that was even up for debate...the sign about the landfill doesn't give enough information or attract enough attention.

Attend more events - Forest City Flea, Inspiration Fest, Folk Fest and have a ballot box for people to sign up on the spot for more information to be sent them. handing them a card and letting them walk away means they will never follow through. collect their details on the spot! Even create a mock poll where people put in a vote prior to receiving any information but include their email address so can send them more facts!

Comment from Lambeth Ratepayer's Association June 1, 2017

As we discussed, I fully endorse and support stream/separation of organic waste. From what I understand of organic waste treatment options, the City believes it can process organic waste through anaerobic means, thereby virtually eliminating odour issues. The City sees successful organic waste treatment as a key to reducing landfill volume.

Unfortunately, recent local history of waste treatment odours creates a substantial headwind of mistrust for communities to take on faith that 'this one will be different'. I hope you can make a compelling case for your scenario.

Another contentious matter is in the policy of accepting waste from other jurisdictions, who have decided it is in their best interest to export their problem to London. Wes, you make a 'for the better good' case that London has engineering, critical mass and site-environment advantages that serve this part of the province over the prospect of many small, inefficient sites dotting the landscape. Given the several large sites already in this area (Lambton, Elgin and London), how will the City of London protect the very real interests of the city and its residents, that London does not continue a trajectory to becoming 'the best little dumpsite in Ontario'? Will it be necessary to update London's logo from Forest City to Dumpsites City?

I suppose one way to thread that needle might be to re-word the Proposed Project proposal to read, "Development of a Resource Recovery Strategy to maximize waste reduction, reuse, recycling, composting and resource recovery in an environmentally responsible manner. Consideration will be given to maximizing the operating life of the W12-A site, to providing limited access to neighbouring communities in crisis under strict inflow controls and costing that will encourage responsible waste management by those communities'.

The re-worded project would then provide City of London with tools to cap total external neighbours inbound flows (at no more than current percentage levels) with a target of reduction to 60% of those flows after 2025. Delivering larger than capped volumes would be dealt with on an exponential, upward sliding pricing scale. This simple mechanism will dispel the concern (and possible temptation) by communities to 'buy their way out of their own environmental obligations at the expense of London's quality of life and reputation.

As you can see, as neigbouring communities grow (and prosper), they will find it to their benefit to make the hard decisions that London is making, to treat their waste in an environmentally responsible way, giving up their capacity to those smaller communities who do not generate a great deal of waste and who have no prospect of the needed infrastructure investment. Fair to all concerned, beneficial to all concerned...

I note, buried deep in the proposal, is incineration. Incineration is hot-button issue with a history of inadequate attention to the science of small particulate matter. Incineration units do exist which do not emit particulate of any size. My perception has been that they are expensive and of limited capacity. Maybe this has changed; if so, then I assume London intends to adopt zero emission incineration technology.

The health issues around incomplete incineration are now so well documented that I won't bother to dwell on them. I believe they are common knowledge in public health circles, energy and general industry.

I trust London's interest in the environment extends to not making its citizens , nor its neighbours, the unwilling recipients of tons of microns of heavy metals, toxins, etc. etc. This one waste management practice, if any, is fraught. In other jurisdictions it is becoming a can for litigation-worms that would make previous suits against our fair City look like 'chump-change'.

Another matter is also on my mind. Raccoons. London's raccoon population is eagerly awaiting a service that will separate organic waste from miscellaneous (inedible) trash, for them. They anticipate easier grazing, less waste-handling and with containers dedicated to organic waste, a readily accessible nightly buffet!

The City of Toronto has apparently designed a collection bin that raccoons are having considerable difficulty getting into. Please consider offering every (participating) resident of London a container of this design - not as a gift, but as a City-owned loan/resource. Like a cell phone or a mutual fund fee, early replacement redemption would be at the expense of the property owner, with a single free replacement on a seven-year cycle. In addition to the public relations & public health benefits, standardized units would improve pick-up safety and efficiency.

Comments from Open House 1 (questions from Comment Booklet) and virtual Open House on getinvolved.london.ca

Q – Should the City commit to increasing the current household waste diversion rate to 60% by 2022

- Yes. The greatest percentage of waste diversion is always a good thing for our future generations.
- Yes but how? Don't want waste in ditches.
- Yes. A "no-brainer" for the planet. We can't keep throwing stuff away (where is "away").
- Yes. This should be a priority instead of pushed to the background. Other municipalities have successful recycling/green bin programmes outstripping London ie Guelph, PEI. Kingston has had a green bin program for years with a similar geographic make-up.
- Yes. We must be serious about recycling and reusing for a city our size.

Q – Is new organic management program(s) the key to reaching 60% diversion by 2022?

- Yes I thing so because a lot of food waste, yard materials and other compost end up in landfill.
- Yes please get this program started
- Yes but only in large places of organic waste
- Yes. Critical!
- Yes. All types of recycling, composting should be considered and priced. The aim is to get as little waste for landfilling as possible.
- Yes. I think we can do better than 60%!

- Maybe. Effective education/promotion of new management programs will be needed; Source-separated organics program will improve public understanding of waste management

Q - Do you think it is acceptable to allow neighbouring municipalities to use any new waste resource recovery facilities developed by the City of London?

- Yes because neighbouring communities don't have many alternative to disposing of waste.
- Yes the more users that can participate the better ideas and ability to incorporate these into practice will happen
- No. Not in my backyard!
- Yes. Reusing resources is the goal.
- No. Green bin management and recycling facilities could be used at a price but not landfill space.
- Yes. Improve environmental responsibility for all!

Q - Do you think that Resource Recovery Strategy needs to be able to accommodate transition to new technology in the future, if appropriate?

- Yes any new technologies are a good thing in the waste industry
- Yes. Put the bright minds out there developing better killing weapons to work on saving the planet for our great-grandchildren.
- Yes. There is no use building a programme which is not cutting edge.
- Yes. Think about tech 20 years ago (1997)... you can see strategies need to adapt faster than that!
- Yes. Always allow for adaptation/evolution for long term plans such as this, especially as the city continues to grow.

Q - Do you have any suggestions, comments or concerns for consideration in the development of the Resource Recovery Strategy?

- Don't turn away some of the newer ideas before having fully explored
- Larger blue boxes. Make private homes responsible for clean up of there own spillage of garbage and blue box.
- Stop garbage at it's source by taxing garbage-intensive products and services. Make sure you have a truly 'local' information session for nearby Glanworth community.
- The administration (political and bureaucratic) must stop vacillating about ultimately recycling or repurposing as much as possible. Get with it!! Then the need for landfill expansion will drastically decline. People must be educated as well that the toss away society is dead!
- Taxes are already very high in the city, so changes to waste management/diversion should not require additional money per household as implied above (Question 4). However, individuals/households should be willing to take on additional responsibility (e.g., increased recycling, source-separated organics programs).

Extensive public education/promotion of the new programs will be needed to encourage individuals/households to take on those responsibilities.

Comments from Facebook post May 23, 2017 advertising Open House 1

- Why not start to go no waste instead building more places to throw garbage. And you would save tax payer dollar. Instead of fixing the problem, you want to find another place to put it.
- Where are our green bins? You don't need a load of meetings to take action on waste reduction.
- We need to stop manufacturers from over-packaging products. We are drowning in garbage.
- Lmao, first off, in your pic if that was at somebodys house they wouldn't take the cardboard because it's not in a blue box, maybe if your workers were all on the same page on what to take
- Can you say green bin?

Comments from Facebook post May 21, 2017 advertising Open House 1

- We are a family of 4. We generally have one bag of garbage per week and 2-3 blue boxes. A Green Box Program is the next best step, in my opinion.
- In Guelph and Toronto, we have Gray, Blue and Green bins. The grey is for regular garbage, we rarely fill the grey bin and it only goes out when it is full. Green bin goes out weekly, and our blue bin is collected every other week here in Guelph.
- It's a stupid system. In today's world not recycling as much as possible is not acceptable.
- London needs to start using the green boxes. We lived in London 21 years and moved to Hamilton a year ago. We have the green boxes and our actual garbage is next to nothing!!
- The green boxes would make a huge difference. The city "tried" to do green bins. They picked a few random neighbourhoods and dropped them off but didn't educate people as to what should go in them (we had one in my complex and the...
- We just moved to London from Burlington where our blue bins & green carts were collected weekly & the garbage every other week. We rarely had a full garbage can, even after 2 weeks, even with a little one in diapers & two cats' litter waste. London's waste collection schedule & no green cart is very wasteful.
- my family use their blue boxes for everything that is allowed, they do our best, wash out everything, sort everything out the best they can but the recycle truck keeps leaving our boxes if they miss one thing on top, it makes them upset cause of it...
- We should have a garbage system that promotes composting, recycling in glass plastic cans and paper form and as little garbage as possible... after we do all of that 1 bin or bag of garbage collection per week seems reasonable... with the population our city has we should have a better system in place like compost pick up!

- Composting would go a long way! Other municipalities practice it for a long time already and I don't understand why London is so far behind...
- We have one bag of garbage, 2 blue boxes per week, Green boxes should be next step. Guelph and other cities have been using for over 17 years
- Council after council has delayed: composing, enforcing recycling and reducing bag limits. We need political courage, not a study.
- They're almost all very smart people but they know that garbage collection is one of the radioactive issues of municipal politics and they avoid messing with it at all costs. Did you see the outcry when they reduced garbage collection a little bit this year? People were losing their minds.
- We need to do something with our garbage, besides burying it. Expand the recycling program.
- I'd like to see the city stop stalling on the implementation of the green bin.
- Simple answers. The only question here is when is this city going to invest in its environment.
- Check out the system St. Thomas has been using for years.
- Green Boxes!!!
- Give us green bins... now.
- London needs to use green bin technology
- simple, stop using stuff you can't recycle
- TEXTILE recycling!!
- London needs green carts. Super easy.
- Is there anywhere that gives out free recycling boxes ?
- Burn it!
- Introduce green bins.

Appendix D

IPSOS Survey Report

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Ipsos Public Affairs

London
CANADA

City of London Waste Diversion

JUNE 2018

FINAL REPORT

GAME CHANGERS

Contents

METHODOLOGY & SAMPLING

METHODOLOGY

- This report presents the findings from a survey of City of London residents about their attitudes and behaviours towards waste diversion.
- In total, n=301 London residents participated in this survey between May 31 and June 4, 2018. The precision of Ipsos online surveys is calculated via a credibility interval. In this case, the sample is considered accurate within +/- 6.4 percentage points, 19 times out of 20, had all London residents been surveyed.
- Significant differences among subgroups are identified using shaded boxes:

  Significantly higher

  Significantly lower

KEY FINDINGS

KEY FINDINGS (1)

Overall, residents are supportive of the City of London's efforts to increase its waste diversion from 45 percent to 60 percent, and are willing to pay for it and change their behaviour to assist in these efforts.

- There is an almost universal view (93%) among City of London residents that waste diversion is important to them, including more than half (53%) who say this is *very important.*
- When residents were informed that increasing the proportion of waste diversion will require additional financial investments, three-quarters (76%) say that they would be willing to pay more for increased waste diversion, with the highest proportion (47%) being prepared to pay between $1 to $25 per household per year.
- Residents were presented with different initiatives to help in waste diversion efforts.
- About six in ten (57%) prefer investing significant resources on waste diversion initiatives, while three in ten (31%) choose a moderate program, and one in ten (12%) prefer no change.
- When presented with options for a City-wide Organics Curbside Program, more than four in ten (43%) prefer a Curbside Green Bin Program, while one-third (32%) choose a Mixed Waste Program, and one-quarter (24%) prefer no change.
- When presented with options for a City-wide Organics Multi-residential Program, opinion is divided with four in ten (40%) who prefer a Multi-residential Green Bin Program and a similar number (41%) choose a Mixed Waste Program. Two in ten (19%) do not want change to the current program.

KEY FINDINGS (2)

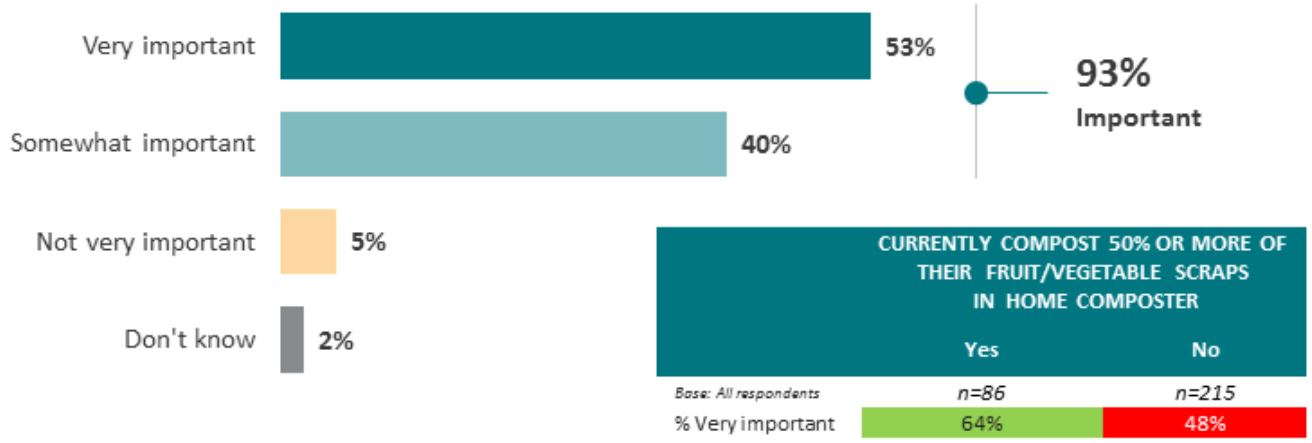
- When residents were informed that items such as electronics, scrap metal, Christmas trees and tires are no longer picked up curbside and have to be dropped off at a depot, two-thirds (65%) indicate that they are prepared to deliver more materials to drop-off depots.
- Six in ten (60%) residents support banning additional materials from garbage pickup, such as old furniture, carpet, small appliances, mattresses, etc., if they could drop them off at a depot for recycling.

WASTE DIVERSION ATTITUDES & BEHAVIOURS

IMPORTANCE OF WASTE DIVERSION

The vast majority (93%) of London residents say that waste diversion is at least somewhat important to them, including over half (53%) who feel it is *very important*.

Those who currently compost 50 percent or more of their fruit and vegetable scraps in a home composter are more likely than those who do not to think waste diversion is *very important* (64% vs. 48%).



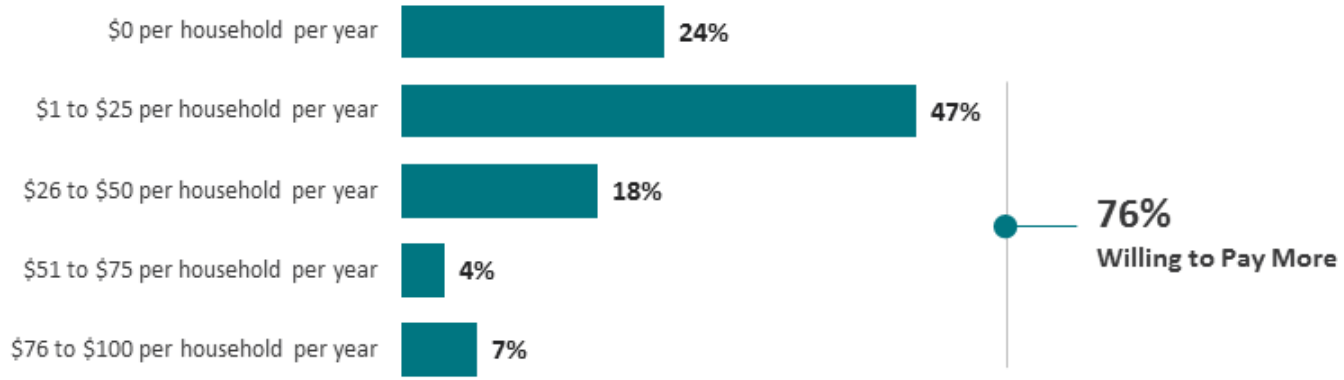
Q.1. Waste diversion is the process of reducing the quantity of waste landfilled and creating new materials of value. How important is waste diversion to you? Base: All Respondents (n=301)

WILLINGNESS TO PAY MORE FOR INCREASED WASTE DIVERSION

Residents were informed that the City of London has set a goal of increasing its waste diversion from 45 percent to 60 percent by 2022, and that reaching this goal will require additional financial investments.

Three-quarters (76%) say that they would be willing to pay more for increased waste diversion, of which the highest proportion (47%) are prepared to pay between $1 to $25 per household per year.

Currently, the residents of London divert 45% of all residential waste.
In 2017, city of London council set A goal to increase this to 60% by 2022.

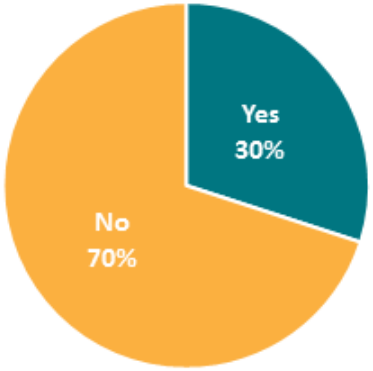


Q.2. Reaching this goal, will require additional financial investments. On a per household basis, how much more would you be prepared to pay in municipal taxes and fees per year to pay for increased waste diversion? (select one). Base: All Respondents (n=301)

CURRENT COMPOSTING BEHAVIOUR

Three in ten (30%) residents currently compost 50 percent or more of their fruit and vegetable scraps in a home composter.

Women are more likely than men to engage in this behaviour (37% vs. 23%).



Compost 50% or more of fruit/vegetable scraps in home composter	GENDER	
	Male	Female
Base: All respondents	*n=118*	*n=183*
% Yes	37%	23%

Q.4. Do you currently compost 50% or more of your fruit and vegetable scraps in a home composter?
Base: All Respondents (n=301)

*Small base
**Extremely small base

WASTE DIVERSION INITIATIVES

On average, each London household wastes about $600 worth of food each year.

This represents food waste that could have been avoided through actions such as better planning for grocery shopping and meals and use of leftovers.

In London, this food waste ends up in landfill. In municipalities with green bin programs [add clickable information icon: Includes weekly collection of organic waste from households, where this waste is separated by homeowners and placed out for separate organic waste pickup], some of the waste is composted. Both options represent a cost to municipalities to handle food waste.

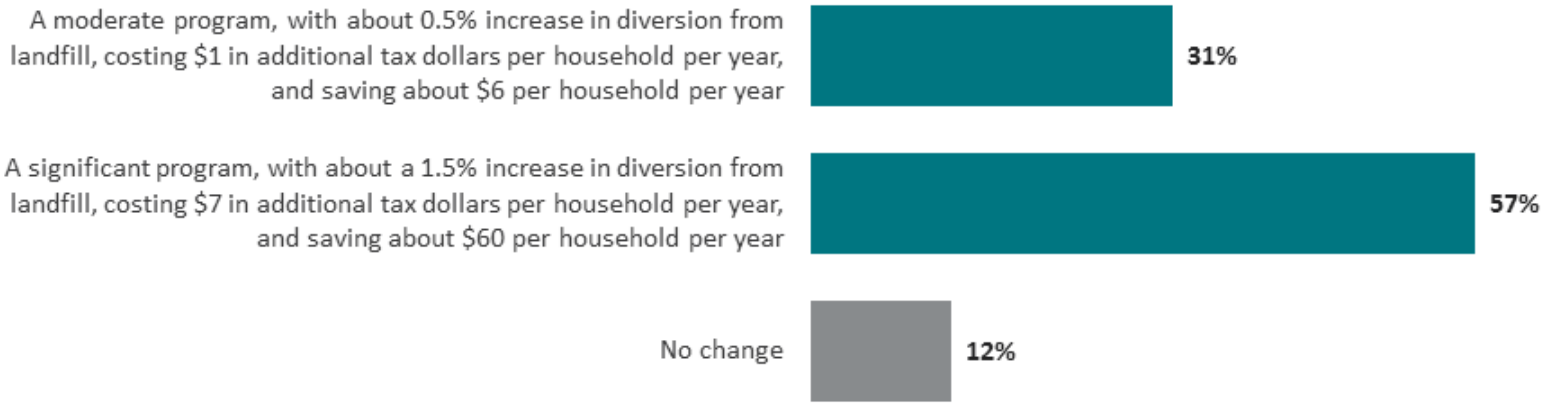
However, reducing food waste, generated by households, from ending up in landfill will save money for households and for municipalities.

The City is considering some food waste reduction initiatives.

PREFERRED INVESTMENT OPTIONS FOR CITY

Residents were presented with two options as to whether the City should invest moderate or significant resources on these waste diversion initiatives.

About six in ten (57%) prefer investing significant resources on waste diversion initiatives, while three in ten (31%) choose a moderate program, and one in ten (12%) prefer no change.

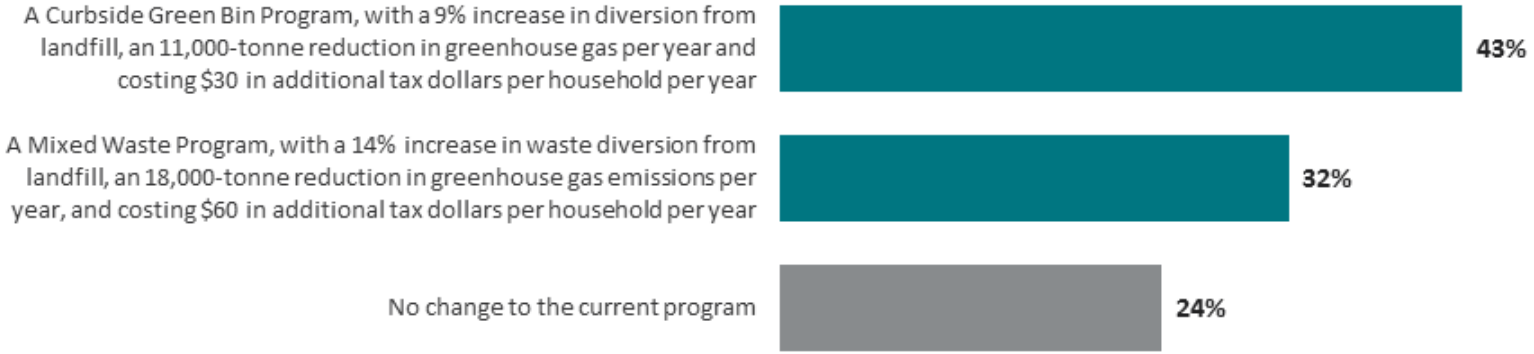


Q.3. The City could invest moderate or significant resources on these initiatives. Which do you prefer? (select one)
Base: All Respondents (n=301)

PREFERRED CITY-WIDE ORGANICS CURBSIDE PROGRAM

When presented with options for a City-wide Organics Curbside Program, more than four in ten (43%) prefer a Curbside Green Bin Program, while one-third (32%) choose a Mixed Waste Program and one-quarter (24%) prefer no change.

Another initiative is a city-wide organics curbside program which would provide the biggest boost to waste diversion.



Q.5. The City is considering two options for a City-wide Organics Curbside Program. Which would you prefer?
Base: All Respondents (n=301)

PREFERRED CITY-WIDE ORGANICS CURBSIDE PROGRAM – BY SUBGROUPS

There are no significant differences among subgroups in preference for a Mixed Waste Program. Renters and those who do not currently compost 50% or more of their fruit/vegetable scraps in a home composter are more likely to prefer a Curbside Green Bin Program. Homeowners are more likely to prefer no change to the current program.

	HOME OWNERSHIP		CURRENTLY COMPOST 50% OR MORE OF THEIR FRUIT/VEGETABLE SCRAPS IN HOME COMPOSTER	
	Rent	Own	Yes	No
Base: All respondents	*n=118*	*n=183*	*n=86**	*N=215*
A Curbside Green Bin Program: [includes weekly collection of organic waste from approximately 120,000 households, where it is separated by homeowners and placed out for separate organic waste pickup], with a 9% increase in diversion from landfill, an 11,000-tonne reduction in greenhouse gas per year and costing $30 in additional tax dollars per household per year.	51%	38%	32%	48%
A Mixed Waste Program: Residents would continue to place organic waste in the garbage and it would be separated out at a mixed waste processing facility to be composted or digested.], with a 14% increase in waste diversion from landfill, an 18,000-tonne reduction in greenhouse gas emissions per year, and costing $60 in additional tax dollars per household per year.	32%	32%	38%	30%
No change to the current program	17%	30%	30%	22%

Q.5. The City is considering two options for a City-wide Organics Curbside Program. Which would you prefer?
Base: All Respondents (n=301)

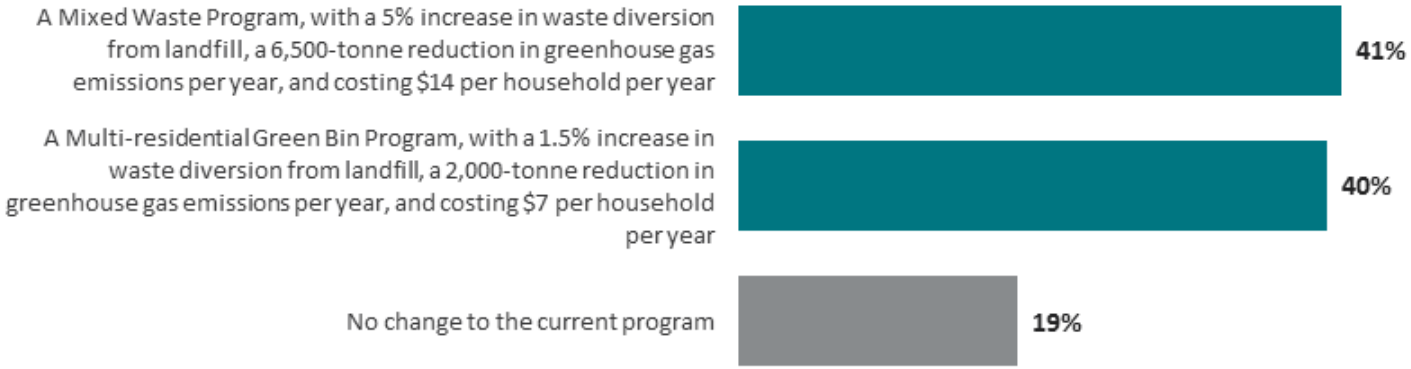
*Small base (under n=100)

PREFERRED ORGANICS MULTI-RESIDENTIAL PROGRAM

When presented with options for a City-wide Organics Multi-residential Program, opinion is divided with four in ten (40%) who prefer a Multi-residential Green Bin Program and a similar number (41%) choose a Mixed Waste Program. Two in ten (19%) do not want change to the current program.

About 30% of London's households live in multi-residential buildings (apartment/condo) and generate approximately 22,000 tonnes of garbage per year.

Another initiative is a City-wide Organics Multi-residential Program similar to curbside.



Q.6. The City is considering two options for a City-wide Organics Multi-residential Program. Which would you prefer?] (select one)
Base: All Respondents (n=301)

PREFERRED ORGANICS MULTI-RESIDENTIAL PROGRAM – BY SUBGROUPS

There are no significant differences among subgroups in preference for a Mixed Waste Program. Preference for a Multi-residential Green Bin is higher among renters, those who have lived fewer than 20 years in London, and those with household income of below $50K. Preference for no change to the current program is higher among those age 35 to 54, homeowners, and those with household income of $100K or above.

	AGE			HOME OWNERSHIP		TIME LIVED IN LONDON		HOUSEHOLD INCOME BEFORE TAXES		
	18-34	35-54	55+	Rent	Own	Less than 20 years	20 + years	<$50K	$50K-<$100K	$100K+
Base: All respondents	*n=48**	*n=85**	*n=168*	*n=118*	*n=183*	*n=101*	*n=200*	*n=145*	*n=106*	*n=50**
A Mixed Waste Program , with a 5% increase in waste diversion from landfill, a 6,500-tonne reduction in greenhouse gas emissions per year, and costing $14 per household per year	43%	36%	45%	41%	42%	39%	43%	38%	48%	38%
A Multi-residential Green Bin Program , with a 1.5% increase in waste diversion from landfill, a 2,000-tonne reduction in greenhouse gas emissions per year, and costing $7 per household per year	49%	36%	36%	47%	34%	48%	34%	48%	33%	26%
No change to the current program	9%	28%	20%	12%	24%	14%	23%	14%	18%	36%

Q.6. The City is considering two options for a City-wide Organics Multi-residential Program. Which would you prefer?] (select one)
Base: All Respondents (n=301)

*Small base (under n=100)

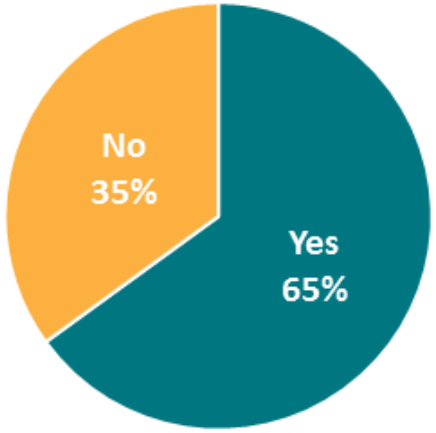
DROPPING OFF MATERIALS AT RECYCLING DEPOT

Over the last number of years, the City has started recycling programs for items such as electronics, scrap metal, Christmas trees and tires.

These items are no longer collected at the curb with garbage and should not be placed in bins at high-rise buildings. Instead, they can be dropped off at depots for recycling.

PREPARED TO DELIVER MORE MATERIALS TO DROP-OFF DEPOTS

When residents were informed that items such as electronics, scrap metal, Christmas trees and tires are no longer picked up curbside and have to be dropped off at a depot, two-thirds (65%) indicate that they are prepared to deliver more materials to drop-off depots.



Q.7. Are you prepared to deliver more materials (e.g., old furniture, carpet, small appliances, mattresses, etc.) to drop off-depots?
Base: All Respondents (n=301)

PREPARED TO DELIVER MORE MATERIALS TO DROP-OFF DEPOTS – BY SUBGROUPS

Openness to deliver more materials to drop-off depots is higher among those aged 18 to 34 and 55+, and among those who have household incomes of between $50K and lower than $100K.

Prepared To Deliver More Materials	AGE			TIME LIVED IN LONDON		HOUSEHOLD INCOME BEFORE TAXES		
	18-34	35-54	55+	Less than 20 years	20 + years	<$50K	$50K-<$100K	$100K+
Base: All respondents	*n=48**	*n=85**	*n=168*	*n=101*	*n=200*	*n=145*	*n=106*	*n=50**
%Yes	74%	53%	67%	74%	59%	60%	75%	59%

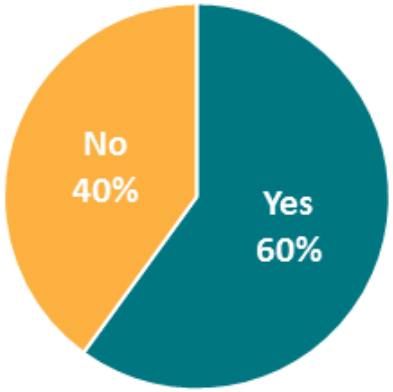
Q.7. Are you prepared to deliver more materials (e.g., old furniture, carpet, small appliances, mattresses, etc.) to drop off-depots?
Base: All Respondents (n=301)

**Small base*

BANNING ADDITIONAL MATERIALS FROM GARBAGE PICKUP

Six in ten (60%) residents support banning additional materials from garbage pickup, such as old furniture, carpet, small appliances, mattresses, etc., if they could drop them off at a depot for recycling.

Residents who are prepared to deliver more materials to drop-off depots are more likely to support banning additional materials from garbage pickup.



Support banning additional materials from garbage pickup	Prepared to deliver more materials to drop-off depots: Yes	Prepared to deliver more materials to drop-off depots: No
Base: All respondents	*n=195*	*n=106*
% Yes	80%	22%

Q.8. Would you support banning additional materials from garbage pickup (e.g., old furniture, carpet, small appliances, mattresses, etc.) if you could drop them off at a depot for recycling? Base: All Respondents (n=301)


DEMOGRAPHICS
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DEMOGRAPHICS

LIVED IN CITY OF LONDON	
Less than 1 year	4%
1 to less than 5 years	12%
5 to less than 10 years	8%
10 to less than 20 years	17%
20 years or more	59%

RESIDENTIAL PROPERTY	
House (single family dwelling)	49%
House (multiple family dwelling)	9%
Apartment	27%
Condominium	12%
Other (please specify)	3%

RENT OR OWN	
Rent	44%
Own	56%

GENDER	
Men	48%
Women	52%

EDUCATION	
Less than high school graduation	3%
Completed high school	18%
Some/completed trade/technical school	7%
Some/completed college	30%
Some/completed university	23%
Graduate/professional studies	18%

HOUSEHOLD INCOME	
Less than $25,000	21%
$25,000 to less than $50,000	30%
$50,000 to less than $75,000	19%
$75,000 to less than $100,000	14%
$100,000 to less than 150,000	11%
$150,000 or more	5%

AGE	
18-34	31%
35-54	32%
55+	37%

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Appendix E

Residential Waste Composition

Table E1: Estimated 2017 Curbside and Multi-Residential Garbage Composition

Table E2: Estimated 2017 Curbside Garbage and Recycling Composition

Table E3: Estimated 2017 Multi-Residential Garbage and Recycling Composition

Table E4: Estimated 2017 Combined Curbside and Multi-Residential Garbage and Recycling Composition

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This appendix provides a summary of the composition of the City's waste (including organics, compostables) and Blue Box recyclables.

Waste composition audits of garbage and Blue Box recyclables were conducted in London 2016/2017 and winter 2018 (with funding, coordination and sampling methodology provided by Stewardship Ontario (SO) and the Resource Productivity and Recovery Authority (RPRA). The waste audits consisted of four separate sets of audits conducted at specific time periods throughout the year (i.e., spring, summer, fall, winter) to address any issues of seasonality. Each audit included two samples taken over two consecutive waste collections to take into account issues of sporadic set out. The audit sample consisted of 100 curbside homes and multi-residential homes to achieve statistical significance. The same households were sampled for each of the four sets of audits.

The audit data was combined with other City data (quantities of garbage and Blue Box recyclables collected from single family homes and multi-residential, multi-residential waste and Blue Box audits from 2017, etc.) to create the following tables:

- Table E1: Estimated 2017 Curbside and Multi-Residential Garbage Composition
- Table E2: Estimated 2017 Curbside Garbage and Recycling Composition
- Table E3: Estimated 2017 Multi-Residential Garbage and Recycling Composition
- Table E4: Estimated 2017 Combined Curbside and Multi-Residential Garbage and Recycling Composition

Waste auditing has been performed and paid for every couple of years in London for more than 15 years by Stewardship Ontario. This work helps London (or other) staff:

- understand the changing composition of the waste stream;
- determine what materials are being captured by London and at what percentages;
- determine what materials should be focused on for waste diversion and recovery;
- determine the calorific value of the waste stream for the purpose of recovering energy through solid recovered fuel, creation of syngas, etc.;
- compare with other communities in Ontario and other areas of Canada; and
- provide data for researchers and academics to pursue additional analysis.

Table E1: Estimated 2017 Curbside and Multi-Residential Garbage Composition

Material Category	Curbside			Multi-Residential			Total
	Per Household kg/yr	Total tonne/yr	%	Per Household kg/yr	Total tonne/yr	%	Total tonne/yr
1. Paper							
Newsprint	2	227	0.4	10	541	2.4	768
Magazines & Catalogues	1	130	0.2	3	148	0.7	278
Directories/Telephone Books	0.1	9	0.0	0.1	3	0.0	12
Other Printed Paper – Recyclable	4	525	0.9	5	300	1.3	825
Other Printed Materials – Non-Recyclable	4	507	0.8	4	227	1.0	734
Total Paper	**11**	**1,397**	2.3	**22**	**1,219**	5.4	**2,616**
2. Paper Packaging							
Gable Top Containers	1	76	0.1	1	69	0.3	145
Aseptic Containers	1	70	0.1	0.4	23	0.1	93
Spiral Wound Containers	0.3	35	0.1	0.3	16	0.1	52
Corrugated Cardboard	4	454	0.7	11	615	2.7	1,069
Boxboard/Cores (Tubes)	9	1,112	1.8	12	647	2.9	1,758
Polycoat Cups/Ice Cream Containers	2	232	0.4	2	104	0.5	336
Other Bleached Long Polycoat Fibre	3	370	0.6	2	101	0.4	471
Other Paper Laminate Categories – Non-Recyclable	1	103	0.2	1	29	0.1	132
Total Paper Packaging	**20**	**2,452**	4.0	**29**	**1,604**	7.1	**4,055**
3. Plastics							
#1 PET	4	440	0.7	6	348	1.5	789
#2 HDPE	1	147	0.2	2	108	0.5	255
#3 - #7 Mixed Plastics	4	472	0.8	4	224	1.0	697
#6 PS - Expanded Polystyrene	3	340	0.6	2	99	0.4	439
Large HDPE & PP Pails & Lids	0.2	21	0.0	0.4	23	0.1	45
LDPE/HDPE Film	17	2,124	3.5	15	858	3.8	2,982
Plastic Laminates – Mostly Non-Recyclable	9	1,082	1.8	6	330	1.5	1,412
Other Rigid Plastic Packaging– Mostly Non-Recyclable	3	401	0.7	2	138	0.6	539
Other Plastic-Non-Packaging/ Durable – Non-Recyclable	8	985	1.6	5	298	1.3	1,283
Total Plastics	**49**	**6,014**	9.8	**44**	**2,426**	10.8	**8,440**

Table E1: Estimated 2017 Curbside and Multi-Residential Garbage Composition (Continued)

Material Category	Curbside			Multi-Residential			Total
	Per Household kg/yr	Total tonne/yr	%	Per Household kg/yr	Total tonne/yr	%	Total tonne/yr
4. Metals							
Aluminum – Food/Beverage Containers	1	138	0.2	2	104	0.5	243
Aluminum - Foil & Trays	2	192	0.3	1	80	0.4	272
Steel – Food & Beverage Containers	2	190	0.3	2	132	0.6	322
Steel/Aluminum – Aerosol Containers (Non-MHSW)	0.4	56	0.1	1	28	0.1	84
Other Aluminum– Non-Blue Box	0.1	13	0.0	0.1	3	0.0	16
Other Steel – Non-Blue Box	3	432	0.7	4	211	0.9	643
Total Metals	**8**	**1,022**	1.7	**10**	**559**	2.5	**1,581**
5. Glass							
Clear Glass	3	408	0.7	4	248	1.1	656
Coloured Glass	1	86	0.1	1	65	0.3	151
Other Glass – Non-Blue Box	5	575	0.9	2	131	0.6	706
Total Glass	**9**	**1,069**	1.7	**8**	**444**	2.0	**1,513**
6. Municipal Hazardous and Special Waste							
Paint & Stain Containers	0.1	8	0.0	0.1	7	0.0	14
Batteries	0.2	31	0.0	0.2	9	0.0	40
Other MHSW	0.5	60	0.1	0.1	4	0.0	63
Total MHSW	**1**	**98**	0.2	**0**	**19**	0.1	**118**
7. Organic Materials							
Avoidable Food Waste	118	14,586	23.8	84	4,700	20.9	19,286
Unavoidable Food Waste	60	7,437	12.1	48	2,693	12.0	10,129
Yard Waste	13	1,619	2.6	8	458	2.0	2,077
Tissue/Towelling – Non-Recyclable	26	3,202	5.2	22	1,243	5.5	4,445
Diapers & Sanitary Products	38	4,665	7.6	21	1,142	5.1	5,808
Pet Waste	51	6,282	10.3	40	2,200	9.8	8,482
Total Organic Materials	**305**	**37,791**	61.7	**224**	**12,435**	55.2	**50,226**
8. Other Materials							
Textiles	15	1,826	3.0	16	877	3.9	2,703
C,R&D	25	3,122	5.1	28	1,531	6.8	4,653
Electronics	3	395	0.6	3	177	0.8	571
Other Non-Recyclable Materials	30	3,724	6.1	22	1,229	5.5	4,952
Bulky Items	19	2,300	3.8	0.0	0.0	0.0	2,300
Total Other Materials	**92**	**11,367**	18.6	**69**	**3,814**	16.9	**12,881**
Grand Total	**495**	**61,210**	**100**	**405**	**22,520**	100	**81,430**

Table E2: Estimated 2017 Curbside Garbage and Recycling Composition

Material Category	Materials Accepted in London's Blue Box Program	Estimated Curbside Composition						
		City				Per Household		
		Blue Box Material Recycled	Material in Garbage	Total	Capture Rate of Blue Box Materials	Blue Box Material Recycled	Material in Garbage	Total
		tonne/ yr	tonne/ yr	tonne/ yr	%	kg/ hhld/ yr	kg/ hhld/ yr	kg/ hhld/ yr
1. Paper								
Newsprint	X	4,656	227	4,883	95	38	2	39
Magazines & Catalogues	X	1,044	130	1,175	89	8	1	9
Directories/ Telephone Books	X	80	9	89	90	1	0.1	1
Other Printed Paper – Recyclable	X	680	525	1,205	56	5	4	10
Other Printed Materials –Non-Recyclable		584	507	1,091	54	5	4	9
Total Paper		**7,045**	**1,397**	**8,442**	**83**	**57**	**11**	**68**
Targeted BB Paper		**6,460**	**891**	**7,351**	**88**	**52**	**7**	**59**
2. Paper Packaging								
Gable Top Containers	X	286	76	362	79	2	1	3
Aseptic Containers	X	94	70	163	57	1	1	1
Spiral Wound Containers	X	39	35	74	52	0	0	1
Corrugated Cardboard	X	4,191	454	4,645	90	34	4	38
Boxboard/Cores (Tubes)	X	2,429	1,112	3,541	69	20	9	29
Polycoat Cups/Ice Cream Containers	X	134	232	366	37	1	2	3
Other Bleached Long Polycoat Fibre		63	370	433	15	1	3	3
Other Paper Laminate Categories – Non-Recyclable		32	103	135	24	0	1	1
Total Paper Packaging		**7,267**	**2,452**	**9,719**	**75**	**59**	**20**	**79**
Targeted BB Paper Packaging		**7,172**	**1,979**	**9,151**	**78**	**58**	**16**	**74**

Table E2: Estimated 2017 Curbside Garbage and Recycling Composition (Continued)

Material Category	Materials Accepted in London's Blue Box Program	Estimated Curbside Composition						
		City				Per Household		
		Blue Box Material Recycled tonne/ yr	Material in Garbage tonne/ yr	Total tonne/ yr	Capture Rate of Blue Box Materials %	Blue Box Material Recycled kg/ hhld/ yr	Material in Garbage kg/ hhld/ yr	Total kg/ hhld/ yr
3. Plastics								
#1 PET	X	1,443	440	1,883	77	12	4	15
#2 HDPE	X	473	147	620	76	4	1	5
#3 - #7 Mixed Plastics	X	398	472	870	46	3	4	7
#6 PS – Expanded Polystyrene		14	340	354	4	0.1	3	3
Large HDPE & PP Pails & Lids	X	46	21	67	68	0.4	0.2	0.5
LDPE/HDPE Film		80	2,124	2,204	4	1	17	18
Plastic Laminates – Mostly Non-Recyclable		27	1,082	1,109	2	0.2	9	9
Other Rigid Plastic Packaging – Mostly Non-Recyclable		157	401	559	28	1	3	5
Other Plastics - Non-Packaging/Durable – Non-Recyclable		193	985	1,178	16	2	8	10
Total Plastics		**2,831**	**6,014**	**8,844**	**32**	**23**	**49**	**71**
Targeted BB Plastics		**2,360**	**1,081**	**3,441**	**69**	**19**	**9**	**28**
4. Metals								
Aluminum – Food/Beverage Containers	X	389	138	527	74	3	1	4
Aluminum - Foil & Trays	X	26	192	219	12	0.2	2	2
Steel - Food & Beverage Containers	X	557	190	747	75	5	2	6
Steel/Aluminum - Aerosol Containers (Non-MHSW)	X	43	56	98	43	0.3	0.4	1
Other Aluminum – Non-Blue Box		2	13	15	12	0.0	0.1	0.1
Other Steel – Non-Blue Box		129	432	561	23	1	3	5
Total Metals		**1,146**	**1,022**	**2,168**	**53**	**9**	**8**	**18**
Targeted BB Metals		**1,016**	**576**	**1,592**	**64**	**8**	**5**	**13**

Table E2: Estimated 2017 Curbside Garbage and Recycling Composition (Continued)

Material Category	Materials Accepted in London's Blue Box Program	Estimated Curbside Composition						
		City				Per Household		
		Blue Box Material Recycled tonne/ yr	Material in Garbage tonne/ yr	Total tonne/ yr	Capture Rate of Blue Box Materials %	Blue Box Material Recycled kg/ hhld/ yr	Material in Garbage kg/ hhld/ yr	Total kg/ hhld/ yr
5. Glass								
Clear Glass	X	1,794	408	2,202	81	14	3	18
Coloured Glass	X	653	86	739	88	5	1	6
Other Glass – Non-Blue Box		82	575	658	13	1	5	5
Total Glass		**2,530**	**1,069**	**3,599**	**70**	**20**	**9**	**29**
Targeted BB Glass		**2,447**	**494**	**2,941**	**83**	**20**	**4**	**24**
6. Municipal Hazardous and Special Waste								
Paint & Stain Containers	X	12	8	20	60	0.1	0.1	0.2
Batteries		0.1	31	31	0	0.0	0.2	0.2
Other MHSW		0.0	60	60	0	0.0	0.5	0.5
Total MHSW		**12**	**98**	**110**	**11**	**0.1**	**1**	**1**
Targeted BB MHSW		**12**	**8**	**20**	**60**	**0.1**	**0.1**	**0.2**
7. Organic Materials								
Avoidable Food Waste		104	14,586	14,689	1	1	118	119
Unavoidable Food Waste		5	7,437	7,442	0	0.0	60	60
Yard Waste		0.0	1,619	1,619	0	0.0	13	13
Tissue/Towelling – Non-Recyclable		0.0	3,202	3,202	0	0.0	26	26
Diapers & Sanitary Products		0.0	4,665	4,665	0	0.0	38	38
Pet Waste		0.0	6,282	6,282	0	0.0	51	51
Total Organic Materials		**109**	**37,791**	**37,900**	**0**	**1**	**305**	**306**
8. Other Materials								
Textiles		0.0	1,826	1,826	0	0.0	15	15
C,R&D		0.0	3,122	3,122	0	0.0	25	25
Electronics		0.0	395	395	0	0.0	3	3
Other Non-Recyclable Materials		337	3,724	4,060	8	3	30	33
Bulky Items		0.0	2,300	2,300	0	0.0	19	19
Total Other Materials		**337**	**11,367**	**11,704**	**3**	**3**	**92**	**95**
Grand Total - Targeted BB		**19,467**	**5,029**	**24,495**	**79**	**157**	**41**	**198**
Grand Total		**21,275**	**61,210**	**82,485**	**26**	**172**	**495**	**666**

Table E3: Estimated 2017 Multi-Residential Garbage and Recycling Composition

Material Category	Materials Accepted in London's Blue Box Program	Estimated Multi-Residential Composition (Excludes Bulky Items)								
		City						Per Household		
			Garbage					Recycling Units		
		Blue Box Material Recycled tonne/yr	Units with Recycling (51,440) tonne/yr	Units without Recycling (4,180) tonne/yr	Total tonne/yr	Total Garbage and Recycling tonne/yr	Capture Rate of Blue Box Materials Units with Recycling kg/hhld/yr	Blue Box Material Recycled kg/hhld/yr	Material in Garbage kg/hhld/yr	Total kg/hhld/yr
1. Paper										
Newsprint	X	935	430	111	541	1,476	69%	18	8	27
Magazines & Catalogues	X	184	123	25	148	331	60%	4	2	6
Directories/ Telephone Books	X	5	2	1	3	8	66%	0.1	0.0	0.1
Other Printed Paper-Recyclable	X	157	266	34	300	457	37%	3	5	8
Other Printed Materials - Non-Recyclable		140	200	28	227	367	41%	3	4	7
Total Paper		**1,420**	**1,021**	**198**	**1,219**	**2,639**	**54%**	**28**	**20**	**47**
Targeted BB Paper		**1,280**	**821**	**171**	**992**	**2,272**	**56%**	**23**	**16**	**39**
2. Paper Packaging										
Gable Top Containers	X	64	59	10	69	133	52%	1	1	2
Aseptic Containers	X	12	20	3	23	35	38%	0.2	0.4	1
Spiral Wound Containers	X	11	14	2	16	28	44%	0.2	0.3	0.5
Corrugated Cardboard	X	378	541	75	615	993	41%	7	11	18
Boxboard/Cores (Tubes)	X	440	565	82	647	1,087	44%	9	11	20
Polycoat Cups/Ice Cream Containers	X	16	95	9	104	119	14%	0.3	2	2
Other Bleached Long Polycoat Fibre		6	93	8	101	107	6%	0.1	2	2
Other Paper Laminate Categories - Non-Recyclable		2	27	2	29	31	6%	0.0	1	1
Total Paper Packaging		**929**	**1,413**	**190**	**1,604**	**2,533**	**37%**	**18**	**27**	**46**
Targeted BB Paper Packaging		**921**	**1,294**	**180**	**1,474**	**2,395**	**42%**	**18**	**25**	**43**

Table E3: Estimated 2017 Multi-Residential Garbage and Recycling Composition (Continued)

Material Category	Materials Accepted in London's Blue Box Program	Estimated Multi-Residential Composition (Excludes Bulky Items)								
		City						Per Household		
			Garbage					Recycling Units		
		Blue Box Material Recycled	Units with Recycling (51,440)	Units without Recycling (4,180)	Total	Total Garbage and Recycling	Capture Rate of Blue Box Materials Units with Recycling	Blue Box Material Recycled	Material in Garbage	Total
		tonne/ yr	tonne/ yr	tonne/ yr	tonne/ yr	tonne/ yr	kg/ hhld/ yr	kg/ hhld/ yr	kg/ hhld/ yr	kg/ hhld/ yr
3. Plastics										
#1 PET	X	307	299	49	348	655	51%	6	6	12
#2 HDPE	X	92	93	15	108	200	50%	2	2	4
#3 - #7 Mixed Plastics	X	77	202	23	224	302	28%	2	4	5
#6 PS - Expanded Polystyrene		5	91	8	99	104	5%	0.1	2	2
Large HDPE & PP Pails & Lids	X	2	21	2	23	26	10%	0.0	0.4	0.5
LDPE/HDPE Film		43	790	68	858	900	5%	1	15	16
Plastic Laminates – Mostly Non-Recyclable		12	304	26	330	342	4%	0	6	6
Other Rigid Plastic Packaging – Mostly Non-Recyclable		30	125	13	138	168	19%	1	2	3
Other Plastic- Non-Packaging/Durable -Non-Recyclable		40	272	25	298	338	13%	1	5	6
Total Plastics		**608**	**2,198**	**228**	**2,426**	**3,034**	**22%**	**12**	**43**	**55**
Targeted BB Plastics		**479**	**615**	**89**	**704**	**1,182**	**44%**	**9**	**12**	**21**
4. Metals										
Aluminum – Food/Beverage Containers	X	62	92	13	104	167	40%	1	2	3
Aluminum – Foil & Trays	X	7	74	7	80	87	9%	0.1	1	2
Steel - Food & Beverage Containers	X	125	113	19	132	257	53%	2	2	5
Steel/Aluminum – Aerosol Containers (Non-MHSW)	X	8	26	3	28	37	25%	0.2	0.5	1
Other Aluminum – Non-Blue Box		1	3	0	3	4	22%	0.0	0.1	0.1
Other Steel – Non-Blue Box		10	195	17	211	221	5%	0	4	4
Total Metals		**213**	**501**	**58**	**559**	**772**	**30%**	**4**	**10**	**14**
Targeted BB Metals		**203**	**304**	**41**	**345**	**547**	**40%**	**4**	**6**	**10**

Table E3: Estimated 2017 Multi-Residential Garbage and Recycling Composition (Continued)

Material Category	Materials Accepted in London's Blue Box Program	Estimated Multi-Residential Composition (Excludes Bulky Items)								
		City						Per Household		
			Garbage					Recycling Units		
		Blue Box Material Recycled tonne/yr	Units with Recycling (51,440) tonne/yr	Units without Recycling (4,180) tonne/yr	Total tonne/yr	Total Garbage and Recycling tonne/yr	Capture Rate of Blue Box Materials Units with Recycling kg/hhld/yr	Blue Box Material Recycled kg/hhld/yr	Material in Garbage kg/hhld/yr	Total kg/hhld/yr
5. Glass										
Clear Glass	X	234	213	35	248	482	52%	4	4	8
Coloured Glass	X	53	57	9	65	118	48%	1	1	2
Other Glass – Non-Blue Box		61	117	14	131	192	34%	1	2	3
Total Glass		**348**	**386**	**58**	**444**	**792**	**47%**	**7**	**8**	**14**
Targeted BB Glass		**287**	**270**	**43**	**313**	**600**	**52%**	**6**	**5**	**11**
6. Municipal Hazardous and Special Waste										
Paint & Stain Containers	X	1	6	1	7	7	12%	0.0	0.1	0.1
Batteries		0.1	9	1	9	9	1%	0.0	0.2	0.2
Other MHSW		0.0	3	0	4	4	0%	0.0	0.1	0.1
Total MHSW		**1**	**18**	**2**	**19**	**20**	**5%**	**0.0**	**0.3**	**0.4**
Targeted BB MHSW		**1**	**6**	**1**	**7**	**7**	**12%**	**0.0**	**0.1**	**0.1**
7. Organic Materials										
Avoidable Food Waste		10	4,346	354	4,700	4,709	0%	0.2	84	85
Unavoidable Food Waste		1	2,490	202	2,693	2,694	0%	0.0	48	48
Yard Waste		0.0	423	34	458	458	0%	0.0	8	8
Tissue/Towelling – Non-Recyclable		0.0	1,149	93	1,243	1,243	0%	0.0	22	22
Diapers & Sanitary Products		0.0	1,057	86	1,142	1,142	0%	0.0	21	21
Pet Waste		0.0	2,035	165	2,200	2,200	0%	0.0	40	40
Total Organic Materials		**11**	**11,500**	**935**	**12,435**	**12,446**	**0%**	**0**	**224**	**224**
8. Other Materials										
Textiles		0.0	811	66	877	877	0%	0.0	16	16
C,R&D		0.0	1,416	115	1,531	1,531	0%	0.0	28	28
Electronics		0.0	163	13	177	177	0%	0.0	3	3
Other Non-Recyclable Materials		81	1,130	98	1,229	1,310	7%	2	22	24
Bulky Items		0.0	0.0	0.0	0.0	0.0	0%	0.0	0.0	0.0
Total Other Materials		**81**	**3,521**	**293**	**3,814**	**3,895**	**2%**	**2**	**68**	**70**
Grand Total - Targeted BB		**3,170**	**3,309**	**525**	**3,834**	**7,004**	**49%**	**62**	**64**	**126**
Grand Total		**3,613**	**20,558**	**1,962**	**22,520**	**26,132**	**15%**	**70**	**400**	**470**

Table E4: Estimated 2017 Combined Curbside and Multi-Residential Garbage and Recycling Composition

Material Category	Materials Accepted in London's Blue Box Program	Estimated Overall Composition						
		City				Per Household		
		Blue Box Material Recycled tonne/ yr	Material in Garbage tonne/ yr	Total tonne/ yr	Capture Rate of Blue Box Materials %	Blue Box Material Recycled kg/hhld/ yr	Material in Garbage kg/hhld/ yr	Total kg/hhld/ yr
1. Paper								
Newsprint	X	5,591	768	6,359	88	31	4	35
Magazines & Catalogues	X	1,228	278	1,506	82	7	2	8
Directories/ Telephone Books	X	85	12	97	88	0.5	0.1	1
Other Printed Paper – Recyclable	X	837	825	1,662	50	5	5	9
Other Printed Materials – Non-Recyclable		724	734	1,458	50	4	4	8
Total Paper		**8,465**	**2,616**	**11,081**	**76**	**47**	**15**	**62**
Targeted BB Paper		**7,741**	**1,882**	**9,623**	**80**	**43**	**10**	**54**
2. Paper Packaging								
Gable Top Containers	X	350	145	495	71	2	1	3
Aseptic Containers	X	106	93	199	53	1	1	1
Spiral Wound Containers	X	50	52	102	49	0.3	0.3	1
Corrugated Cardboard	X	4,569	1,069	5,638	81	25	6	31
Boxboard/Cores (Tubes)	X	2,869	1,758	4,627	62	16	10	26
Polycoat Cups/Ice Cream Containers	X	149	336	485	31	1	2	3
Other Bleached Long Polycoat Fibre		69	471	540	13	0.4	3	3
Other Paper Laminate Categories – Non-Recyclable		34	132	166	20	0.2	1	1
Total Paper Packaging		**8,196**	**4,055**	**12,251**	**67**	**46**	**23**	**68**
Targeted BB Paper Packaging		**8,093**	**3,453**	**11,546**	**70**	**45**	**19**	**64**

Table E4: Estimated 2017 Combined Curbside and Multi-Residential Garbage and Recycling Composition (Continued)

Material Category	Materials Accepted in London's Blue Box Program	Estimated Overall Composition						
		City				Per Household		
		Blue Box Material Recycled tonne/ yr	Material in Garbage tonne/ yr	Total tonne/ yr	Capture Rate of Blue Box Materials %	Blue Box Material Recycled kg/hhld/ yr	Material in Garbage kg/hhld/ yr	Total kg/hhld/ yr
3. Plastics								
#1 PET	X	1,750	789	2,538	69	10	4	14
#2 HDPE	X	565	255	820	69	3	1	5
#3 - #7 Mixed Plastics	X	476	697	1,172	41	3	4	7
#6 PS - Expanded Polystyrene		20	439	459	4	0	2	3
Large HDPE & PP Pails & Lids	X	48	45	93	52	0	0	1
LDPE/HDPE Film		122	2,982	3,104	4	1	17	17
Plastic Laminates – Mostly Non-Recyclable		39	1,412	1,451	3	0.2	8	8
Other Rigid Plastic Packaging – Mostly Non-Recyclable		187	539	726	26	1	3	4
Other Plastic – Non-Packaging/Durable-Non-Recyclable		232	1,283	1,515	15	1	7	8
Total Plastics		**3,439**	**8,440**	**11,879**	**29**	**19**	**47**	**66**
Targeted BB Plastics		**2,838**	**1,785**	**4,623**	**61**	**16**	**10**	**26**
4. Metals								
Aluminum - Food/Beverage Containers	X	451	243	694	65	3	1	4
Aluminum - Foil & Trays	X	34	272	306	11	0.2	2	2
Steel – Food & Beverage Containers	X	682	322	1,004	68	4	2	6
Steel/Aluminum – Aerosol Containers (Non-MHSW)	X	51	84	135	38	0.3	0.5	1
Other Aluminum – Non-Blue Box		3	16	19	13	0.0	0.1	0
Other Steel – Non-Blue Box		139	643	782	18	1	4	4
Total Metals		**1,359**	**1,581**	**2,940**	**46**	**8**	**9**	**16**
Targeted BB Metals		**1,218**	**921**	**2,139**	**57**	**7**	**5**	**12**
5. Glass								
Clear Glass	X	2,028	656	2,684	76	11	4	15
Coloured Glass	X	706	151	857	82	4	1	5
Other Glass – Non-Blue Box		144	706	850	17	1	4	5
Total Glass		**2,878**	**1,513**	**4,390**	**66**	**16**	**8**	**24**
Targeted BB Glass		**2,734**	**806**	**3,541**	**77**	**15**	**4**	**20**

Table E4: Estimated 2017 Combined Curbside and Multi-Residential Garbage and Recycling Composition (Continued)

Material Category	Materials Accepted in London's Blue Box Program	Estimated Overall Composition						
		City				Per Household		
		Blue Box Material Recycled tonne/ yr	Material in Garbage tonne/ yr	Total tonne/ yr	Capture Rate of Blue Box Materials %	Blue Box Material Recycled kg/hhld/ yr	Material in Garbage kg/hhld/ yr	Total kg/hhld/ yr
6. Municipal Hazardous and Special Waste								
Paint & Stain Containers	X	13	14	27	47%	0.1	0.1	0.2
Batteries		0.2	40	40	0%	0.0	0.2	0.2
Other MHSW		0.0	63	63	0%	0.0	0.4	0.4
Total MHSW		**13**	**118**	**130**	**10%**	**0.1**	**1**	**1**
Targeted BB MHSW		**13**	**14**	**27**	**47%**	**0.1**	**0.1**	**0.2**
7. Organic Materials								
Avoidable Food Waste		113	19,286	19,399	1%	1	108	108
Unavoidable Food Waste		7	10,129	10,136	0%	0	56	56
Yard Waste		0.0	2,077	2,077	0%	0	12	12
Tissue/Towelling – Non-Recyclable		0.0	4,445	4,445	0%	0	25	25
Diapers & Sanitary Products		0.0	5,808	5,808	0%	0	32	32
Pet Waste		0.0	8,482	8,482	0%	0	47	47
Total Organic Materials		**120**	**50,226**	**50,346**	**0%**	**1**	**280**	**281**
8. Other Materials								
Textiles		0.0	2,703	2,703	0%	0.0	15	15
C,R&D		0.0	4,653	4,653	0%	0.0	26	26
Electronics		0.0	571	571	0%	0.0	3	3
Other Non-Recyclable Materials		418	4,952	5,370	8%	2	28	30
Bulky Items		0.0	2,300	2,300	0%	0.0	13	13
Total Other Materials		**418**	**15,181**	**15,599**	**3%**	**2**	**85**	**87**
Grand Total - Targeted BB		**22,637**	**8,862**	**31,499**	**72%**	**126**	**49**	**176**
Grand Total		**24,887**	**83,730**	**108,617**	**23%**	**139**	**467**	**605**

Appendix F

Overview of Key Environmental, Social, Financial and Technical Considerations for Various Waste Diversion Programs/Initiatives

Food Waste Avoidance

Home (Backyard) Composting

Community Composting

Curbside Organics Collection

Multi-Residential Organics Collection

Carpet

Electrical Equipment/Small Metal

Mattresses

Bulky Plastics

Textiles

Wooden Furniture

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Source of GHG reduction estimates

GHG reductions estimates have been estimated using the Environment Canada's GHG Calculator for Waste Management model and the U.S Environmental Protection Agency's Waste Reduction Model (WARM, version 14 released March 2016). Environment Canada created the GHG Calculator for Waste Management in 2005 to help municipalities and other users estimate lifecycle GHG emission reductions from different waste management practices, including recycling, composting, anaerobic digestion, combustion, and landfilling. This model is based on the EPA WARM lifecycle emissions estimating tool, which has been in use and updated since 1993.

Various models exist worldwide and may produce different results. For the purpose of the 60% Waste Diversion Action Plan, both models were used for the potential waste diversion programs and initiatives. The EPA WARM was used to estimate GHG reductions for carpet, electrical equipment/ small metal, mattresses, bulky plastics and wooden furniture. The Environment Canada model was used to estimate GHG reductions for food waste avoidance, home composting, community composting, curbside organics collection and multi-residential organics collection. Textiles GHG reductions were estimated using the reduction factor provided in the scientific journal article *Environmental Sustainability through Textile Recycling* published in the Journal of Textile Science & Engineering Environmental Sustainability (Chavan, J Textile Sci Eng 2014, S2 https://www.omicsonline.org/open-access/environmental-sustainability-through-textile-recycling-2165-8064.S2-007.pdf).

Program estimates

The information in this appendix is consistent with the information provided to the public for feedback. Please note that some of the program estimates in the main body are for pilot or reduced programs and therefore will be different than the estimates in this appendix for a fully implemented program.

Consideration			Food Waste Avoidance	
			Moderate Outreach Program	**Significant Outreach Program**
Environmental	Change in Diversion	Annual Tonnes Diverted	200 to 600	800 to 2,100
		Contribution to 60% Target	0.1% to 0.4%	0.5% to 1.3%
	GHG Benefits	Reduction per Tonne Diverted	2.9 tonnes	
		Annual Reduction (tonnes)	580 to 1,750 (145 to 440 cars removed from the road[a])	2,300 to 6,100 (580 to 1,500 cars removed from the road[a])
Social	Public Support		Strong support for some kind of program	
	Resident Benefits/ Issues		• Potential homeowner savings of $900,000 to $2,700,000	• Potential homeowner savings of $4,000,000 to $10,000,000
Financial	Cost[b]	Collection	$0	$0
		Processing	$0	$0
		Other	$150,000 to $200,000	$1,100,000 to $1,200,000
		Total	$150,000 to $200,000	$1,100,000 to $1,200,000
	Cost per Household		$0.9 to $1.1	$6.5 to $7.0
	Market/Revenue		Not applicable	Not applicable
Technical	Collection Issues		Not applicable	Not applicable
	Processing Issues		Not applicable	Not applicable
	Other		• Pilot project completed, lower cost program more effective in reducing avoidable food waste in garbage • Effectiveness on large scale unknown	

Notes

(a) The diversion of these materials has avoided the Greenhouse Gas (GHG) emissions equivalent to removing the identified number of vehicles per year.

(b) Based on industry estimates, literature review and data from other municipalities.

Consideration			Home Composting	
			Moderate Outreach Program, 50% Subsidy	**Significant Outreach Program, 75% Subsidy**
Environmental	Change in Diversion	Annual Tonnes Diverted	320 to 640	800 to 1,200
		Contribution to 60% Target	0.2% to 0.4%	0.5% to 0.7%
	GHG Benefits	Reduction per Tonne Diverted	0.8 tonnes	
		Annual Reduction (tonnes)	260 to 500 (65 to 125 cars removed from the road[a])	640 to 960 (160 to 240 cars removed from the road[a])
Social	Public Support		General support for some subsidy program	
	Resident Benefits/ Issues		• Compost for use by homeowner • Homeowner must purchase composter unit	• Compost for use by homeowner • Homeowner must purchase composter unit
Financial	Cost[b]	Collection	$0	$0
		Processing	$0	$0
		Other	$80,000 to $170,000	$220,000 to $250,000
		Total	$80,000 to $170,000	$220,000 to $250,000
	Cost per Household		$0.44 to $0.94	$1.2 to $1.4
	Market/Revenue		No revenue	No revenue
Technical	Collection Issues		Not Applicable	Not Applicable
	Processing Issues		Not Applicable	Not Applicable
	Other		Not Applicable	Not Applicable

Notes

(a) The diversion of these materials has avoided the Greenhouse Gas (GHG) emissions equivalent to removing the identified number of vehicles per year.

(b) Based on industry estimates, literature review and data from other municipalities.

Consideration			Community Composting		
			Low Tech Program Public	**Low Tech Program Private**	**High Tech Program Public**
Environmental	Change in Diversion	Annual Tonnes Diverted	10 to 19	10 to 19	80 to 240
		Contribution to 60% Target	0.01%	0.01%	0.05% to 0.14%
	GHG Benefits	Reduction per Tonne Diverted	0.8 tonnes		
		Annual Reduction (tonnes)	8 to 15 tonnes (2 to 4 cars removed from the road[a])	8 to 15 tonnes (2 to 4 cars removed from the road[a])	64 to 200 tonnes (16 to 50 cars removed from the road[a])
Social	Public Support		General support for community composting program		
	Resident Benefits/ Issues		• Simple design and access • Public access may cause quality issues	• Simple design and access	• More knowledge required • Public access may cause quality issues
Financial	Cost[b]	Collection	$0	$0	$0
		Processing	$0	$0	$0
		Other	$1,500 to $3,000	$5,000 to $10,000	$52,000 to $78,000
		Total	$1,500 to $3,000	$5,000 to $10,000	$52,000 to $78,000
	Cost per Household		$0.01 to $0.02	$0.03 to $0.06	$0.30 to $0.45
	Market/Revenue		No revenue	No revenue	No revenue
Technical	Collection Issues		Not Applicable	Not Applicable	Not Applicable
	Processing Issues		Not Applicable	Not Applicable	Not Applicable
	Other		• City responsible for maintenance	• Private maintenance	• City responsible for maintenance

Notes

(a) The diversion of these materials has avoided the Greenhouse Gas (GHG) emissions equivalent to removing the identified number of vehicles per year.

(b) Based on industry estimates, literature review and data from other municipalities.

Consideration			Curbside Organics Collection	
			Curbside Green Bin Program	**Mixed Waste Program**
Environmental	Change in Diversion	Annual Tonnes Diverted	13,000 to 20,000	18,000 to 35,000
		Contribution to 60% Target	8% to 12%	11% to 22%
	GHG Benefits	Reduction per Tonne Diverted	0.8 tonnes	
		Annual Reduction (tonnes)	10,400 to 16,000 (2,600 to 4,000 cars removed from the road[a])	14,400 to 28,000 (3600 to 5,800 cars removed from the road[a])
Social	Public Support		Strong Support	General Interest
	Resident Benefits/ Issues		• Homeowner has to source separate organics	• Convenient • Homeowner does not have to source separate
Financial	Cost[b]	Collection	$2,500,000 to $3,000,000	$0
		Processing	$1,400,000 to $2,500,000	$9,000,000 to $14,000,000
		One Time Capital Cost	$12,000,000 over 10 years	$0
		Total	$3,900,000 to $5,500,000	$9,000,000 to $14,000,000
	Cost per Household		$20 to $30	$50 to $80
	Market/Revenue		Potential to produce compost or renewable natural gas	
Technical	Collection Issues		New collection vehicles required	Incorporated with current pick up schedule
	Processing Issues		None	Compost/digestate product may have difficulty meeting Ontario standards
	Other		Odour concerns with facility locations	

Notes

(a) The diversion of these materials has avoided the Greenhouse Gas (GHG) emissions equivalent to removing the identified number of vehicles per year.

(b) Based on industry estimates, literature review and data from other municipalities.

Consideration			Multi-Residential Organics Collection	
			Multi-Residential Green Cart Program	**Mixed Waste Program**
Environmental	Change in Diversion	Annual Tonnes Diverted	2,000 to 2,500	6,000 to 10,000
		Contribution to 60% Target	1.2% to 1.4%	4.0% to 6.0%
	GHG Benefits	Reduction per Tonne Diverted	0.8 tonnes	
		Annual Reduction (tonnes)	1,600 to 2,000 (400 to 500 cars removed from the road[a])	4,800 to 8,000 (1,200 to 2,000 cars removed from the road[a])
Social	Public Support		Strong Support	Strong Support
	Resident Benefits/ Issues		• Odour from large scale collection	• Not Applicable
Financial	Cost[b]	Collection	$1,100,000 to $1,400,000	$0
		Processing	$220,000 to $275,000	$3,000,000 to $5,000,000
		Other	$0	$0
		Total	$1,300,000 to $1,675,000	$3,000,000 to $5,000,000
	Cost per Household		$7.2 to $9.3	$20 to $30
	Market/Revenue		Potential to produce compost or renewable natural gas	
Technical	Collection Issues		New collection vehicles required	Incorporated with current pick up schedule
	Processing Issues		None	Compost/digestate product may have difficulty meeting Ontario standards
	Other		Odour concerns with facility locations	

Notes

(a) The diversion of these materials has avoided the Greenhouse Gas (GHG) emissions equivalent to removing the identified number of vehicles per year.

(b) Based on industry estimates, literature review and data from other municipalities.

Consideration			Carpet	
			Collection at EnviroDepots (on a cost recovery basis)	**Curbside and EnviroDepot Collection (no user fee)**
Environmental	Change in Diversion	Annual Tonnes Diverted	200 to 300	600 to 800
		Contribution to 60% Target	0.12% to 0.18%	0.35% to 0.45%
	GHG Benefits	Reduction per Tonne Diverted	2.6 tonnes	
		Annual Reduction (tonnes)	520 to 780 (130 to 195 cars removed from the road[a])	1,550 to 2,100 (390 to 520 cars removed from the road[a])
Social	Public Support		Strong Support	Strong Support
	Resident Benefits/ Issues		• Inconvenience of transporting to EnviroDepot	• Convenience of curb side pick up
Financial	Cost[b]	Collection	$8,000 to $15,000	$96,000 to $112,000
		Processing	$60,000 to $93,000	$180,000 to $248,100
		Other	$0	$0
		Total	$68,000 to $108,000	$276,000 to $360,000
	Cost per Household		$0.38 to $0.60	$1.5 to $2.0
	Market/Revenue		Outside processor at cost to City	Outside processor at cost to City
Technical	Collection Issues		Not applicable	Not applicable
	Processing Issues		Currently only one option in province	
	Other		Not applicable	Not applicable

Notes

(a) The diversion of these materials has avoided the Greenhouse Gas (GHG) emissions equivalent to removing the identified number of vehicles per year.

(b) Based on industry estimates, literature review and data from other municipalities.

Consideration			Electrical Equipment/Small Metal
			Collection at the Curb
Environmental	Change in Diversion	Annual Tonnes Diverted	250 to 400
		Contribution to 60% Target	0.15% to 0.25%
	GHG Benefits	Reduction per Tonne Diverted	4.4 tonnes
		Annual Reduction (tonnes)	1,100 to 1,760 (275 to 440 cars removed from the road[a])
Social	Public Support		Strong Support
	Resident Benefits/ Issues		Convenience of curbside pick up
Financial	Cost[b]	Collection	$70,000 to $80,000
		Processing	$0
		Other	$20,000 to $40,000
		Total	$90,000 to $120,000
	Cost per Household		$0.50 to $0.67
	Market/Revenue		$40,000 to $60,000
Technical	Collection Issues		Incorporated with current pickup schedule
	Processing Issues		Private processor
	Other		Strong markets, commodity prices fluctuate

Notes

(a) The diversion of these materials has avoided the Greenhouse Gas (GHG) emissions equivalent to removing the identified number of vehicles per year.

(b) Based on industry estimates, literature review and data from other municipalities.

Consideration			Mattresses	
			Collection at EnviroDepots (on a cost recovery basis)	**Curbside and EnviroDepot Collection (banned for curbside collection)**
Environmental	Change in Diversion	Annual Tonnes Diverted	200 to 300	600 to 800
		Annual Units Diverted	10,000 to 15,000	30,000 to 40,000
		Contribution to 60% Target	0.12% to 0.18%	0.35% to 0.50%
	GHG Benefits	Reduction per Tonne Diverted	2.6 tonnes	
		Annual Reduction (tonnes)	520 to 780 (130 to 195 cars removed from the road[a])	1,550 to 2,100 (390 to 520 cars removed from the road[a])
Social	Public Support		Strong Support	Strong Support
	Resident Benefits/ Issues		• Inconvenience of transporting to Envirodepot	• Convenience of curbside pick up
Financial	Cost[b]	Collection	$40,000 to $60,000	$192,000 to $232,000
		Processing	$160,000 to $240,000	$480,000 to $640,000
		Other	$0	$0
		Total	$200,000 to $300,000	$600,000 to $870,000
	Cost per Household		$1.1 to $1.7	$3.7 to $4.8
	Market/Revenue		No revenue	No revenue
Technical	Collection Issues		Not applicable	Incorporated with current pickup schedule
	Processing Issues		Private processor	Private processor
	Other		Not applicable	Not applicable

Notes

(a) The diversion of these materials has avoided the Greenhouse Gas (GHG) emissions equivalent to removing the identified number of vehicles per year.

(b) Based on industry estimates, literature review and data from other municipalities.

Consideration			Bulky Plastics
			Collection at EnviroDepots
Environmental	Change in Diversion	Annual Tonnes Diverted	50 to 100
		Contribution to 60% Target	0.03% to 0.06%
	GHG Benefits	Reduction per Tonne Diverted	1.0 tonnes
		Annual Reduction (tonnes)	50 to 100 (15 to 25 cars removed from the road[a])
Social	Public Support		Strong Support
	Resident Benefits/ Issues		• Inconvenience of transporting to EnviroDepot
Financial	Cost[b]	Collection	$8,000 to $16,000
		Processing	$50,000 to $100,000[c]
		Other	$0
		Total	$8,000 to $16,000
	Cost per Household		$0.05 to $0.09
	Market/Revenue		$50,000 to $100,000[c]
Technical	Collection Issues		Not applicable
	Processing Issues		Private processor
	Other		Not applicable

Notes

(a) The diversion of these materials has avoided the Greenhouse Gas (GHG) emissions equivalent to removing the identified number of vehicles per year.
(b) Based on industry estimates, literature review and data from other municipalities.
(c) Cost of processing material will be covered by the revenue from market

Consideration			Textiles	
			Enhanced Awareness and Drop-off Program	**Enhanced Awareness, Drop-off and Curbside Collection Program**
Environmental	Change in Diversion	Annual Tonnes Diverted	245 to 380	640 to 760
		Contribution to 60% Target	0.15% to 0.23%	0.38% to 0.45%
	GHG Benefits	Reduction per Tonne Diverted	14 tonnes	
		Annual Reduction (tonnes)	3,400 to 5,300 (850 to 1325 cars removed from the road[a])	9,000 to 10,600 (2,250 to 2,650 cars removed from the road[a])
Social	Public Support		Moderate Support	Moderate Support
	Resident Benefits/ Issues		• Inconvenience of transporting to drop-offs	• Convenience of curbside pick up
Financial	Cost[b]	Collection[c]	$0	$72,000 to $86,000
		Processing	$0	$0
		Other	$15,000 to $40,000	$20,000 to $40,000
		Total	$15,000 to $40,000	$92,000 to $126,000
	Cost per Household		$0.08 to $0.23	$0.41 to $0.49
	Market/Revenue		No revenue	No revenue
Technical	Collection Issues		Not applicable	Incorporated with current pickup schedule
	Processing Issues		Private processor	Private processor
	Other		Not applicable	Not applicable

Notes

(a) The diversion of these materials has avoided the Greenhouse Gas (GHG) emissions equivalent to removing the identified number of vehicles per year.
(b) Based on industry estimates, literature review and data from other municipalities.
(c) Costs covered by vendor

Consideration			Wooden Furniture	
			Collection at EnviroDepots	**Curbside and EnviroDepot Collection**
Environmental	Change in Diversion	Annual Tonnes Diverted	100 to 150	100 to 150
		Contribution to 60% Target	0.06% to 0.06%	0.06% to 0.09%
	GHG Benefits	Reduction per Tonne Diverted	3.8 tonnes	
		Annual Reduction (tonnes)	380 to 570 (95 to 145 cars removed from the road[a])	380 to 570 (95 to 145 cars removed from the road[a])
Social	Public Support		Moderate Support	Moderate Support
	Resident Benefits/ Issues		• Inconvenience of transporting to EnviroDepot	• Convenience of curbside pickup
Financial	Cost[b]	Collection	$0	$60,000 to $70,000
		Processing	$9,000 to $12,000	$10,000 to $12,000
		Other	$0	$0
		Total	$9,000 to $12,000	$70,000 to $82,000
	Cost per Household		$0.05 to $0.07	$0.40 to $0.50
	Market/Revenue		No revenue	No revenue
Technical	Collection Issues		Not applicable	Incorporated with current pick-up schedule
	Processing Issues		Private processor	Private processor
	Other		Not applicable	Not applicable

Notes

(a) The diversion of these materials has avoided the Greenhouse Gas (GHG) emissions equivalent to removing the identified number of vehicles per year.

(b) Based on industry estimates, literature review and data from other municipalities.

Appendix G
Summary of Ontario Green Bin Programs

Table G1: Ontario Green Bin Programs - Operational Details

Table G2: Ontario Green Bin Programs

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This appendix provides a summary of Ontario municipal Green Bin programs (Tables G-1 and G-2). The summary provides operational details categorized by:

- municipalities allowing plastic bags, sanitary products and pet waste
- municipalities not allowing plastic bags, sanitary products or pet waste
- municipalities allowing pet waste but not plastic bags or sanitary products

The Ontario municipalities surveyed had the following common collection challenges:

- Source separated organics (SSO) freezes in collection bin
- Wildlife overturning bins and creating mess
- Leachate leaks from collection vehicle
- Loose organics in bin not emptying
- Broken bins in winter
- Overweight bins
- Placement of unacceptable materials in bin (plastic, glass)

Data was collected from Resource Productivity & Recovery Authority (RPRA) and other municipalities and compiled by 2cg Consulting and City of London staff.

Table G-1: Ontario Green Bin Programs – Operational Information

Municipality	Quantity of Households		Eligibility of Multi-Family Households for Green Bin Collection[1]	Collection Container Size (litres)	Allowable liner (plastic, certified compostable plastic, paper)	Collection Details		
	Single Family	Multi-Family	(All, Some, None)			SSO Collection Frequency	Garbage Collection Frequency	Leaf/Yard Top Up
Municipalities allowing plastic bags, sanitary products and pet waste								
Toronto	461,089	649,194	All	97	-plastic -paper -compostable plastic	Weekly	Bi-Weekly	No
York Region	315,025	51,290	Some, lower tier municipalities provide collection services (e.g., Markham) and others do not	46	-paper & compostable plastic (preferred) -plastic (accepted)	Weekly	Bi-Weekly	No

Municipality	Quantity of Households		Eligibility of Multi-Family Households for Green Bin Collection[1]	Collection Container Size (litres)	Allowable liner (plastic, certified compostable plastic, paper)	Collection Details		
	Single Family	Multi-Family	(All, Some, None)			SSO Collection Frequency	Garbage Collection Frequency	Leaf/Yard Top Up
Municipalities NOT allowing plastic bags, sanitary products and pet waste								
Barrie	42,436	11,200	None[2]	46	-paper -compostable plastic	Weekly	Bi-weekly	No
Durham	200,192	24,298	None	46	-paper -compostable plastic	Weekly	Bi-Weekly	No
Hamilton	173,349	50,445	All	-46 downtown -120	-paper -compostable plastic	Weekly	Weekly	No
Halton Region	165,787	39,674	All	-46 -360 some townhomes	-paper -compostable plastic	Weekly	Bi-Weekly	No
Kingston	45,062	8,456	All	-46 Downtown -80 residential	-paper -compostable plastic	Weekly	Weekly	Yes
Ottawa	285,541	117,376	None	-80 single family - 240 multi-family	-paper	Weekly	Bi-weekly	Yes
Ottawa Valley	16,743	1,647	None	120	-paper	Weekly	Bi-weekly	Yes
Peel Region	338,362	98,656	None	100	-paper -compostable plastic	Weekly	Bi-weekly	Yes
Simcoe County	123,730	5,852	None[3]	46	-paper -compostable plastic	Weekly	Weekly	No

Municipality	Quantity of Households		Eligibility of Multi-Family Households for Green Bin Collection[1]	Collection Container Size (litres)	Allowable liner (plastic, certified compostable plastic, paper)	Collection Details		
	Single Family	Multi-Family	(All, Some, None)			SSO Collection Frequency	Garbage Collection Frequency	Leaf/Yard Top Up
City of St. Thomas	13,427	3,576	None	240	-paper -compostable plastic	Bi-Weekly	Weekly	Yes
Municipalities NOT allowing plastic bags or sanitary products and accept pet waste								
Waterloo	150,201	59,039	Some, multi-family households with 6 units or less	46	-paper -compostable plastic	Weekly	Bi-Weekly	No
Guelph	29,901	26,026	All	80	-paper -compostable plastic	Weekly	Bi-weekly	Yes
Niagara Region	165,301	31,527	Some, multi-family households with 6 units or less	-46 residential -80 small business	-paper -compostable plastic	Weekly	Weekly	Yes

Notes:

1. Some municipalities only provide curbside green bin collection service, therefore multi-family households are ineligible to participate.

2. Household quantities from 2016, multi-family green bin collection service implemented January 2017, therefore multi-family households ineligible to receive green bin collection service.

3. Multi-family households may be eligible for curbside green bin collection, eligibility determined by municipality on an application process.

Table G-2: Ontario Green Bin Programs – Collection and Processing Information

Municipality	Quantity of Households Eligible for Service			SSO Collection 2016 Quantity		Processing Facility
	Single Family	Multi-Family[1]	Total	Tonnes	Kilograms per household	
Municipalities allowing plastic bags, sanitary products and pet waste						
Toronto	461,089	649,194	1,110,283	132,560	119	-majority at Disco Road Organics Processing Facility -small portion processed by contractors
York Region	315,025	25,645[2]	340,670	97,044	285	-Orgaworld (London) -LaFleche Environmental (Moose Creek)
Municipalities NOT allowing plastic bags, sanitary products and pet waste						
Barrie	42,436	0[3]	52,436	4,123	97	-All Treat Farms (Walker Environmental Group)
Durham	200,192	0	224,490	27,612	138	-Durham Region (Miller Compost)
Hamilton	173,349	50,445	223,794	30,025	134	-Hamilton Central Composting Facility
Halton Region	165,787	39,674	205,461	27,682	135	-Hamilton Central Composting Facility
Kingston	45,062	8,456	53,518	3,959	74	-Norterra (Kingston)
Ottawa	285,541	117,376	402,943	70,918	176	-Orgaworld (Ottawa)
Ottawa Valley	16,743	0	16,743	3,878	232	-Ottawa Valley Waste Recovery Centre (Pembrooke)
Peel Region	338,362	0	338,362	59,726	177	-Peel Region (Brampton, Caledon)

Municipality	Quantity of Households Eligible for Service			SSO Collection 2016 Quantity		Processing Facility
	Single Family	Multi-Family[1]	Total	Tonnes	Kilograms per household	
Simcoe County	123,730	0	123,730	10,798	87	-Hamilton Central Composting Facility
City of St. Thomas	13,427	0	13,427	4,046	301	-Orgaworld (London)
Municipalities NOT allowing plastic bags or sanitary products and accept pet waste						
Waterloo	150,201	2,952[4]	153,153	10,364	68	-Guelph Organic Waste Processing Facility
Guelph	29,901	26,026	55,927	9,744	174	-Guelph Organic Waste Processing Facility
Niagara Region	165,301	1,576[4]	166,877	11,508	69	-Walker Environmental Group (Niagara)

Notes:

1. For calculation purposes, municipalities that do not provide multi-family households green bin collection service are assumed zero. Participation may be minimal and would not significantly contribute to the kilograms per household quantity.

2. The region provides some green bin collection service to lower tier municipalities. This quantity of multi-family households that receive green bin collection service is estimated at 50% of eligible multi-family households.

3. Multi-family green bin collection service implemented January 2017, kilograms per household calculation does not include multi-family units as the tonnage is from 2016 prior to program implementation.

4. Multi-family units with 2-6 units are eligible for green bin collection service. For calculation purposes 5% of the total multi-family units is assumed.

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Appendix H

Mixed Waste Processing Pilot Project Results

Waste Composition of Mixed Waste Streams (2cg Consulting, 2017)

High Diversion MRF Results (Canada Fibers, 2017)

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REPORT

Waste Composition of Mixed Waste Streams

City of London

September 2017

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1.0 Introduction

2cg Inc. (2cg) was retained by the City of London (City) to undertake a waste composition analysis of municipal solid waste (MSW) loads delivered by the City of London to Canada Fibers Ltd. Dongara mixed waste processing facility. Inbound loads of MSW (curbside single family or curbside single family/multi-residential) were processed and divided into a number of fractions through mechanical means. 2cg undertook a composition analysis of the three waste fractions: “lights”; “medium-heavies”; and “heavies” (i.e. low to high density). Fieldwork took place on 31 August and 1 September 2017.

2.0 Methodology

Canada Fibers staff collected the waste stream samples according to the waste fractions and a crew of two 2cg staff were used to collect and sort the sub-samples.

2.1 Sample Collection

Large samples of the three waste fractions from the two waste generation sources were collected directly off the line and delivered to a sorting area by Canada Fibers staff in an approximately 1-3 cubic metre bin. 2cg extracted 10-25 kg sub-samples from all three streams (increasing sample size as wastes became heavier). A total of five curbside sub-samples of “lights”; three curbside & multi-residential sub-samples of “lights”; five curbside sub- samples of “medium-heavies”; four curbside & multi-residential sub-samples of “medium heavies”; four curbside sub-samples of “heavies”; and four curbside & multi-residential sub-samples of “heavies” were extracted and sorted.

2.2 Sample Sorting

The typical sorting set up is shown in Photos 1 and 2. Each sub-sample was sorted into 18 categories (Table 2.1) and the data was entered into an Excel spreadsheet for analysis.

Photo 1. Scale set up

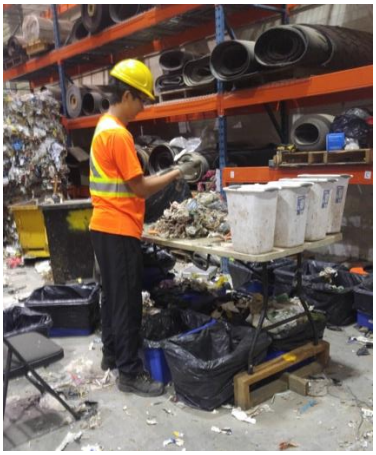


Photo 2. Waste sorting set up

Table 2.1 Sorting Categories

Category
Recyclable Fiber
Non-Recyclable Fiber
Recyclable Plastic
Non-Recyclable Plastic
Recyclable Metals
Non-Recyclable Metals
Glass
Organics
Sanitary & Pet Waste
C&D
Ceramics
Tires & Rubber
Textiles
MHSW
WEEE
Bulky Items
Other
Fines

3.0 Results and Discussion

3.1 Curbside "Lights" Fraction

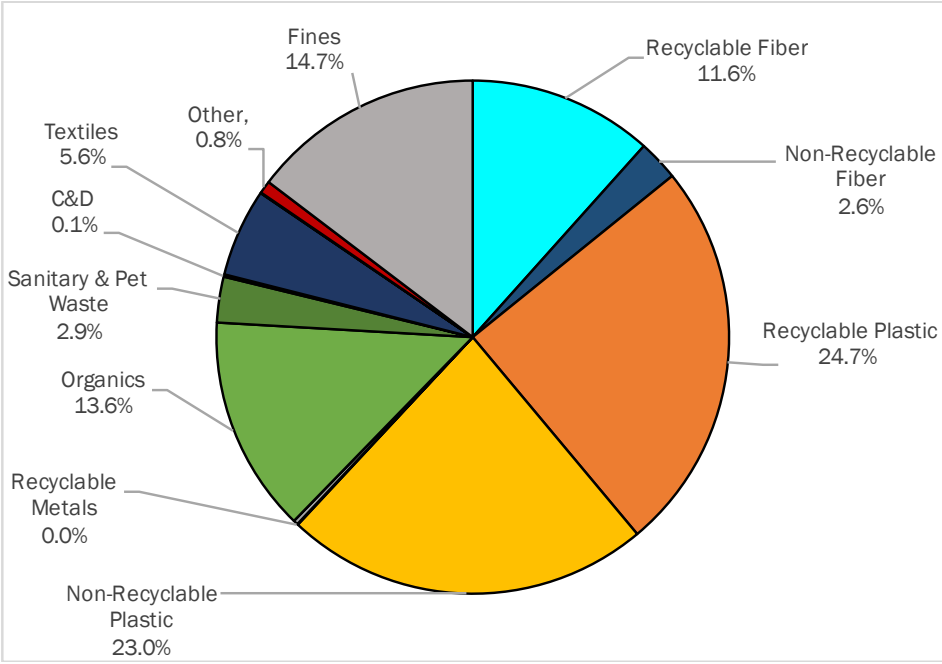
Five sub-samples of curbside "lights" fraction weighing a total of 45.12 kg were sorted (Photo 3). The overall results of the curbside "lights" fraction can be found in Table 3.1 in Appendix 1.

Figure 3.1 depicts the overall composition of the "lights". It consisted largely of recyclable plastic, non-recyclable plastic, fines and organics.

The recyclable plastic was primarily grocery bags and recyclable film plastic. The non-recyclable plastic was primarily laminated plastic packaging and rigid plastic packaging. The fines were primarily small pieces of mostly paper and plastic (see Appendix 2 for definition). The organics were primarily soiled tissue and yard waste.

Photo 3. "Lights" curbside sample bin

Figure 3.1 Overall – Curbside Light Waste Fraction Composition



3.2 Curbside & Multi-Residential "Lights" Fraction

Three sub-samples of curbside & multi-residential "lights" fraction weighing a total of 30.62 kg was sorted (Photo 3). The overall results of the curbside & multi- residential "lights" fraction can be found in Table 3.2 in Appendix 1.

Figure 3.2 depicts the overall composition of the "lights". It consisted largely of recyclable plastic, non-recyclable plastic and recyclable fiber.

The recyclable plastic was primarily grocery bags and recyclable film plastic. The non-recyclable plastic was primarily durable plastic product and rigid plastic packaging. The recyclable fiber was primarily mixed office paper and cardboard.

Photo 3. Curbside & Multi-Residential "Lights" organic waste

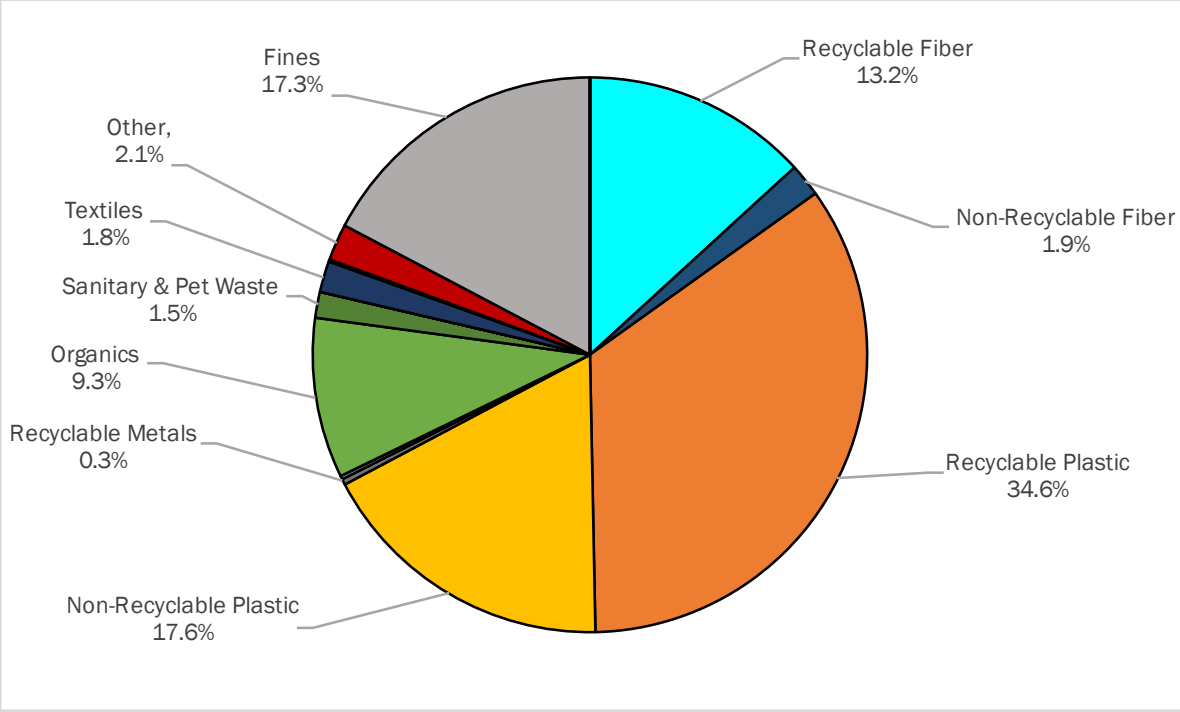


Figure 3.2 Overall Curbside & Multi-Residential Light Waste Fraction Composition

3.3 Curbside "Medium-Heavies" Fraction

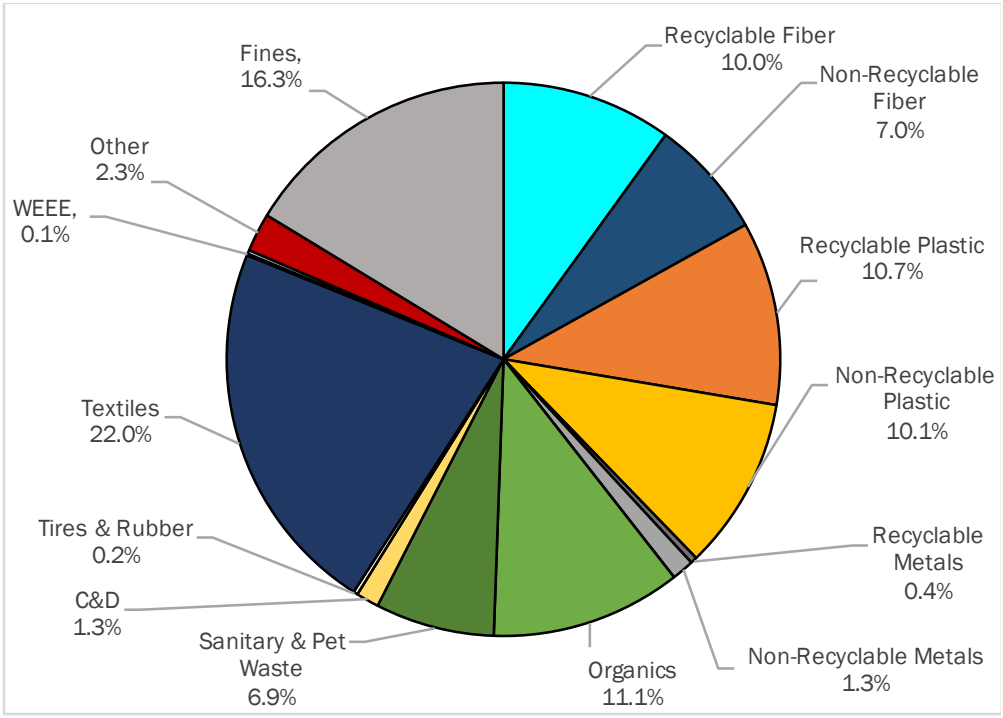
Five curbside sub-samples of "medium-heavies" weighing a total of 73.16 kg were sorted (Photo 4). The overall results of the curbside "medium-heavies" fraction can be found in Table 3.3 in Appendix 1.

Figure 3.3 depicts the overall composition of the "medium-heavies". It consisted largely of textiles, fines and organic waste.

The textiles were primarily clothing items. The fines consisted of unidentifiable materials due to the process of shredding waste (Appendix 2). The organic waste was primarily tissues and food waste.

Photo 4. "Medium-Heavies" Organic Waste

Figure 3.3 Overall Curbside Medium-Heavies Waste Fraction Composition



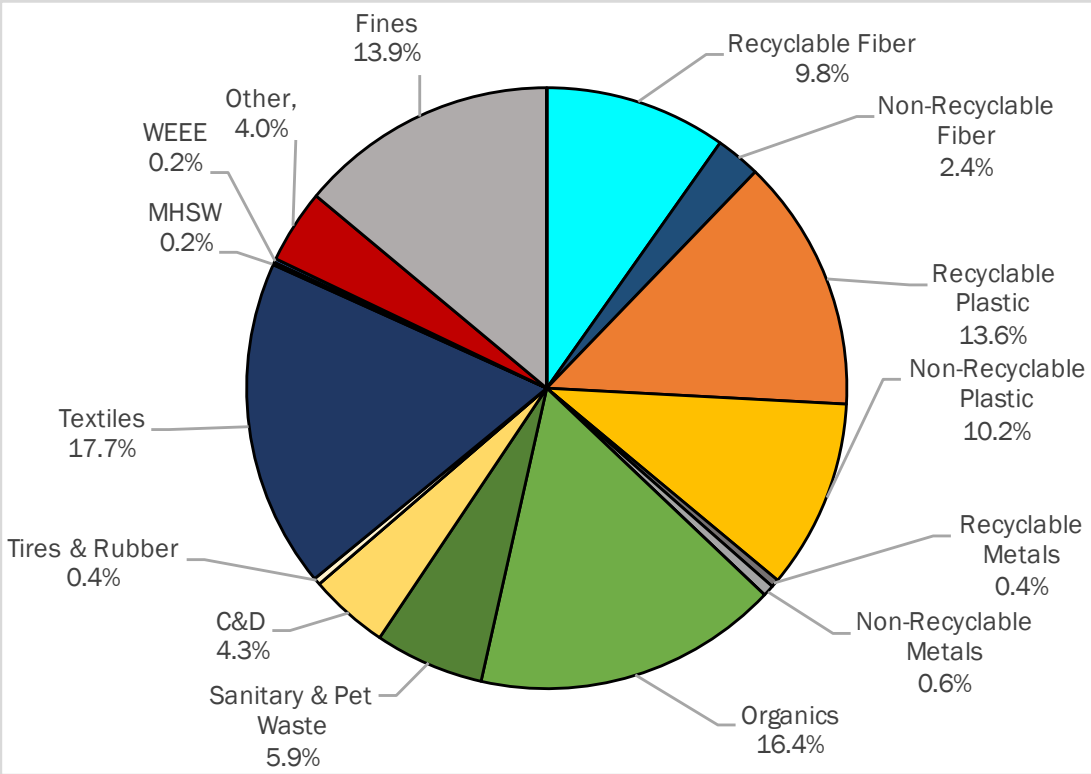
3.4 Curbside & Multi-Residential "Medium-Heavies" Fraction

Four curbside & multi-residential sub-samples of "medium-heavies" weighing a total of 64.14 kg were sorted. The overall results of the "medium-heavies" fraction can be found in Table 3.4 in Appendix 1.

Figure 3.4 depicts the overall composition of the curbside & multi-residential "medium-heavies". It consisted largely of textiles, organics, fines and recyclable plastic.

The textiles were primarily clothing items. The organic waste was primarily tissue toweling and food waste. The fines consisted of unidentifiable materials due to the process of shredding waste (see Appendix 2 for definition). The recyclable plastic was primarily rigid plastic packaging and film packaging.

Figure 3.4 Overall Curbside & Multi-Residential Medium-Heavies Waste Fraction Composition



3.5 Curbside "Heavies" Fraction

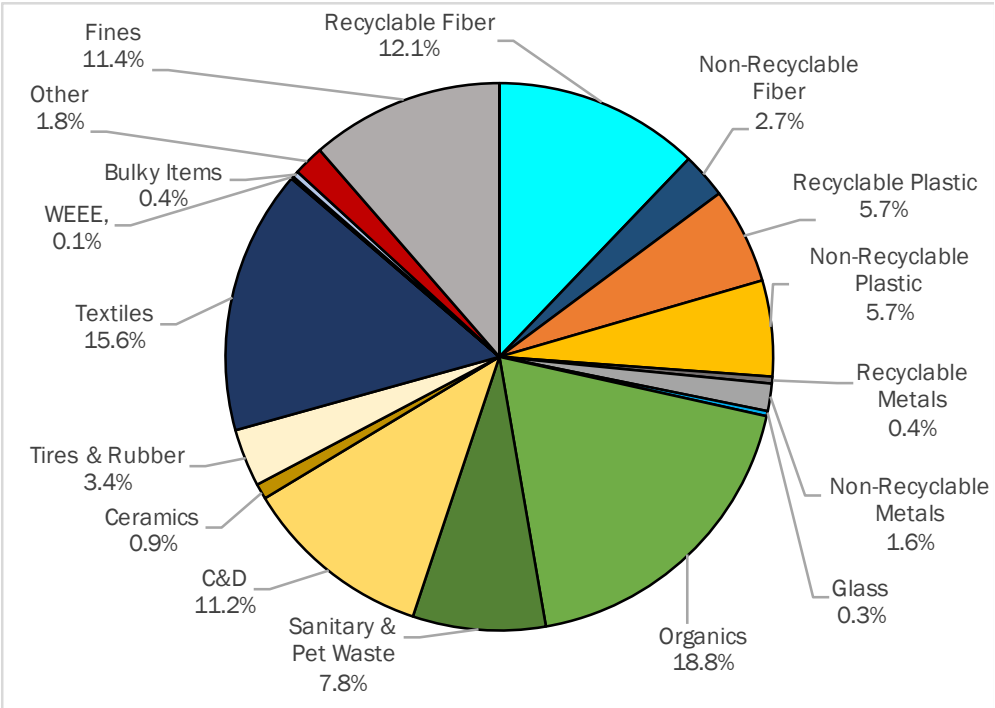
Four curbside sub-samples of curbside "heavies" fraction weighing a total of 69.26 kg were sorted (Photo 5). The overall results of the curbside "heavies" fraction can be found in Table 3.5 in Appendix 1.

Figure 3.5 depicts the overall composition of the "heavies". It consisted largely of organics, recyclable fiber, fines and C&D waste.

The organics consisted largely of tissue and unavoidable food waste (i.e. corn husks). The recyclable fiber consisted largely of cardboard and boxboard. The fines consisted of unidentifiable materials due to the process of shredding waste (Appendix 2). The C&D consisted largely of chunks of wood and brick.

Photo 5. Curbside "Heavies" Sample

Figure 3.5 Overall Curbside Heavy Waste Fraction Composition



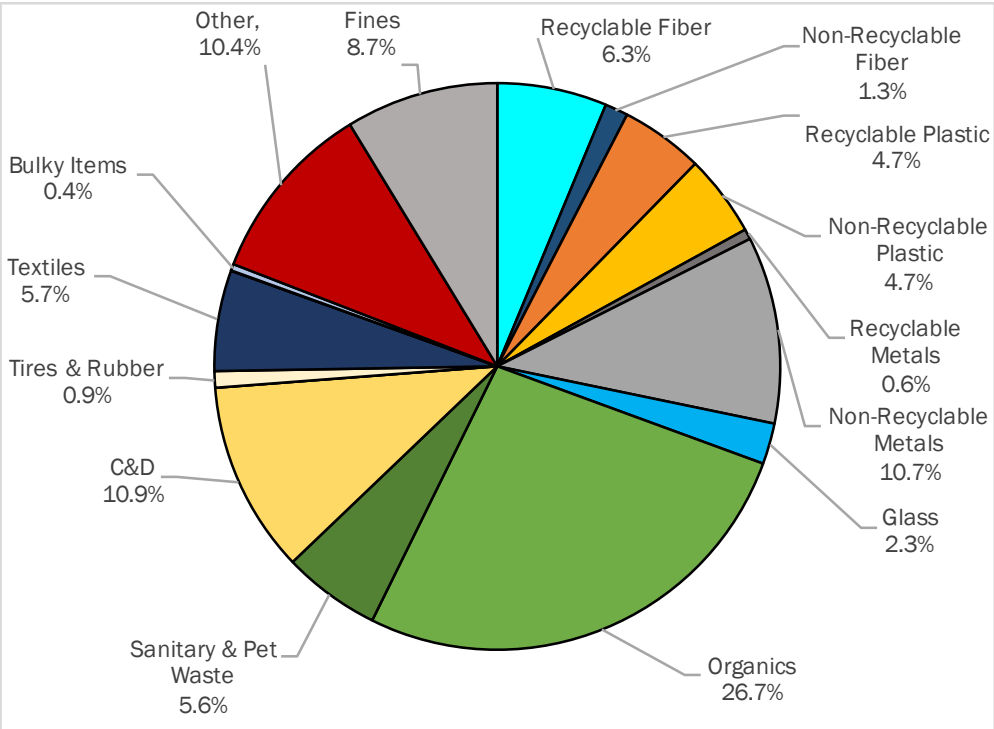
3.6 Curbside & Multi-Residential "Heavies" Fraction

Four curbside & multi-residential sub-samples of the "heavies" fraction weighing a total of 85.92 kg were sorted. The overall results of the curbside & multi-residential "heavies" fraction can be found in Table 3.6 in Appendix 1.

Figure 3.6 depicts the overall composition of the "heavies". It consisted of organics, C&D, non-recyclable metals and other waste.

The organics largely consisted of avoidable food waste. The C&D consisted largely of chunks of cement and tile. The non-recyclable metal consisted largely of other metal and other aluminum. The other waste consisted largely of various toys (e.g. baseballs, tennis balls) and bathtub mats.

Figure 3.6 Overall Curbside & Multi-Residential Heavy Waste Fraction Composition



3.7 Curbside Overall Data Analysis

Tables 3.1, 3.3 and 3.5 show that there is considerable variability (i.e., see min and max) with the three waste fractions in curbside samples.

Figure 3.7 shows the proportion of recyclable materials compared for the three waste fractions. It shows that recyclable waste varied per waste stream during this audit. Recyclable Fiber was found to be most prominent in “heavies”, followed by “medium-heavies” and “lights”. This is likely due to the soiled nature of the recyclable fiber. Recyclable Plastic was found to be most prominent in “lights”, followed by “medium-heavies” and “heavies”. This is likely due to the light weight of carry out bags (the most prominent recyclable plastic). Recyclable Metals were found to be most prominent in the “heavies” and “medium-heavies” waste fraction, which was primarily aluminum and steel cans.

Figure 3.7 Comparison of Recyclable Material in Waste Fractions

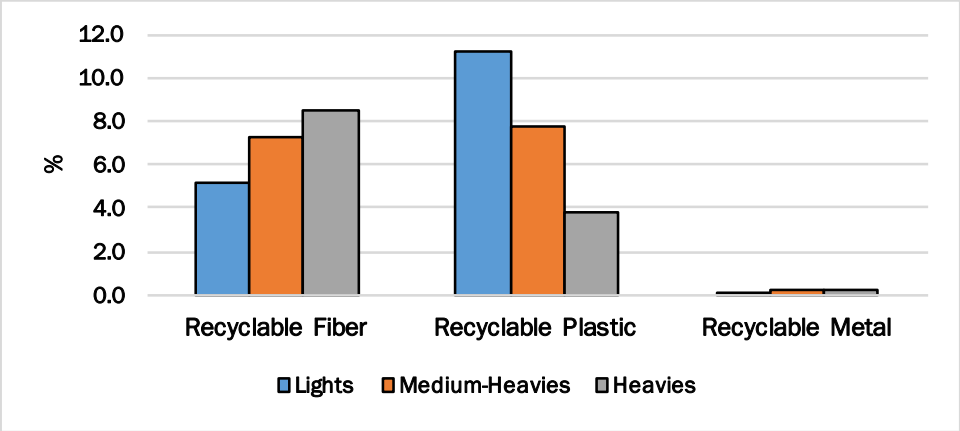


Figure 3.8 shows the proportion of non-recyclable materials compared for the three curbside waste fractions. It shows that non-recyclable fiber was primarily found in "medium-heavies". Non-recyclable plastic is most prominent in "lights" and "medium-heavies". Non-recyclable metals are most prominent in "heavies" and "medium-heavies". Non-recyclable glass was most prominent in "heavies". This is likely due to the round and heavy nature of the glass food containers and other glass products.

Figure 3.8 Comparison of Non-Recyclable Material in Waste Fractions

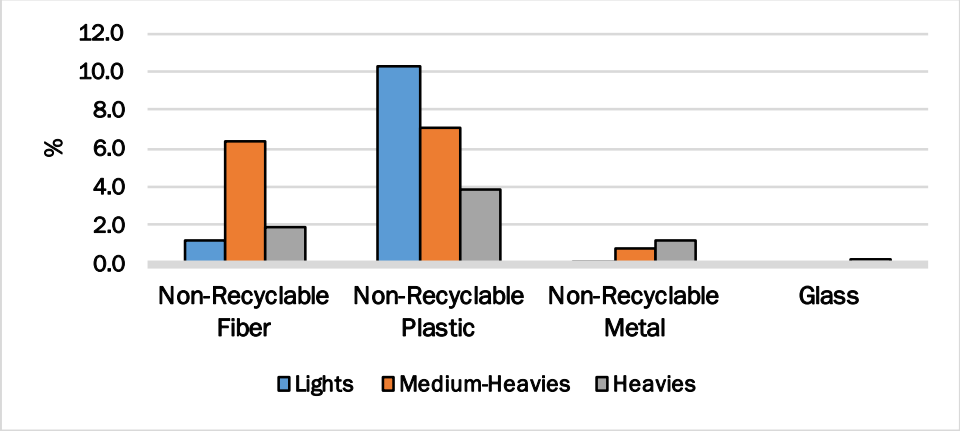


Figure 3.9 shows the proportion of residual materials compared for the three waste fractions. It shows that there is a considerable amount of textiles, which are most prominent in "medium-heavies" fraction.

Figure 3.9 Comparison of Residual Material in Waste Fractions

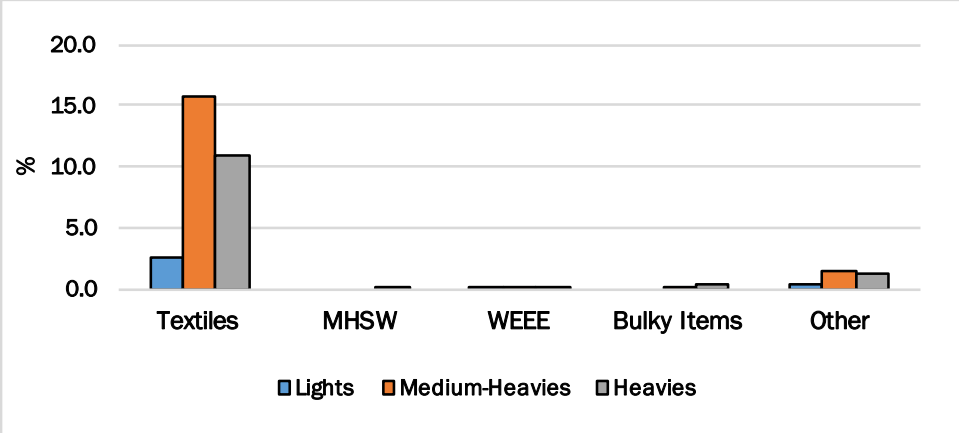


Figure 3.10 shows the proportion of organic materials compared for the three waste fractions. It shows that organic waste is more prominent in “heavies”. This is largely due to the roll-off (round organics enter the “heavies” roll-off bin). Sanitary & pet waste was found to be equally prominent in “medium-heavies” and “heavies”. This is largely due to the heavy nature of sanitary and pet waste.

Figure 3.10 Comparison of Organic Material in Waste Fractions

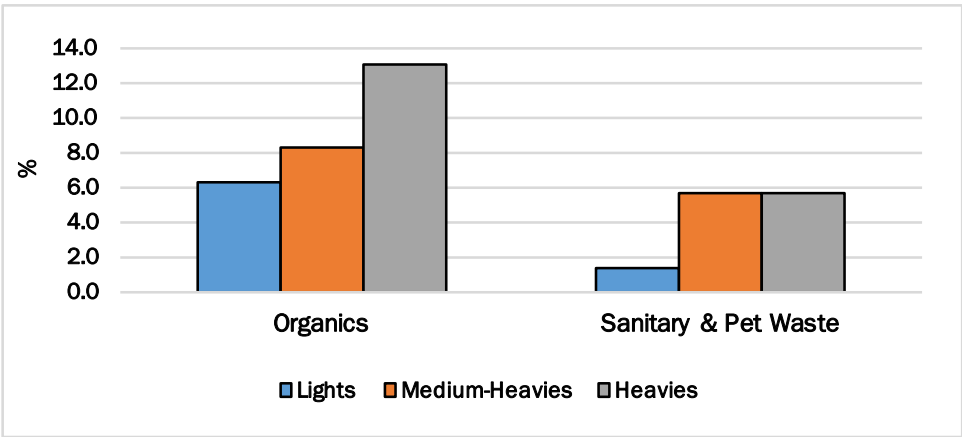


Figure 3.11 shows the proportion of construction materials compared for the three waste fractions. It shows that the majority of construction materials were found in the “heavies”, followed by “medium-heavies”. There was no ceramic or tires & rubber in “lights”.

Figure 3.11 Comparison of Construction Material in Waste Fractions

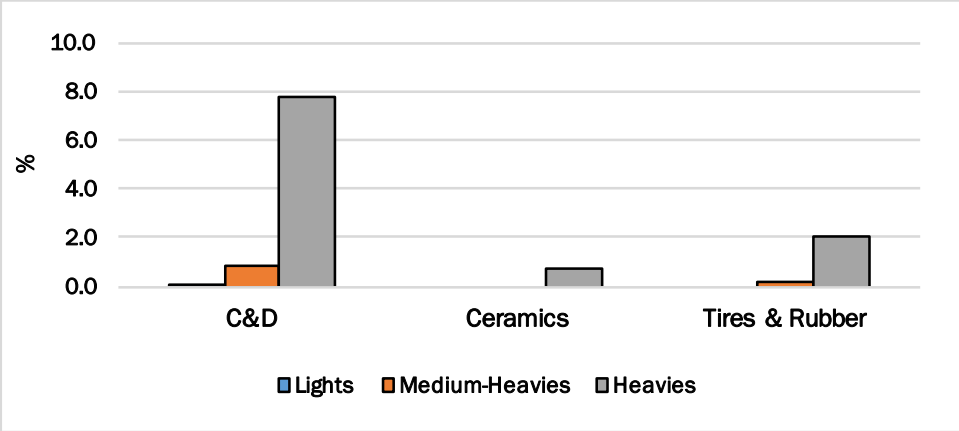
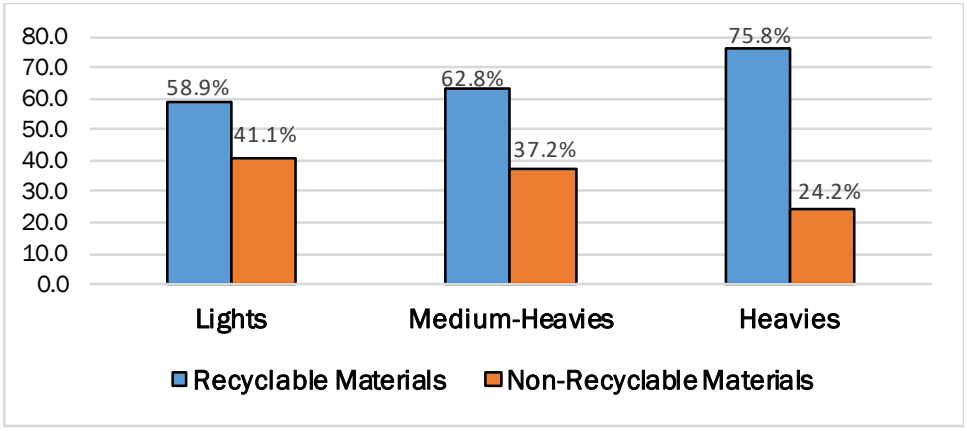


Figure 3.12 shows the overall proportion of recyclable and non-recyclable materials compared for the three waste fractions. It shows that as wastes became heavier, there was an increase in recyclable material and a decrease in non-recyclable materials, with all fractions representing over 55% divertible materials.

Figure 3.12 Overall Comparison of Recyclable Vs. Non-Recyclable Materials in Waste Fractions



3.4 Curbside & Multi-Residential Overall Data Analysis

Tables 3.2, 3.4 and 3.6 show that there is considerable variability (i.e., see min and max) with the three waste fractions in curbside & multi-residential samples.

Figure 3.13 shows the proportion of recyclable materials compared for the three waste fractions. It shows that recyclable waste varied per waste stream during this audit depending on the waste fraction. Recyclable fiber and recyclable plastic was most prominent in “medium-heavies”. The recyclable metal was most prominent in “heavies”.

Figure 3.13 Comparison of Recyclable Material in Waste Fractions

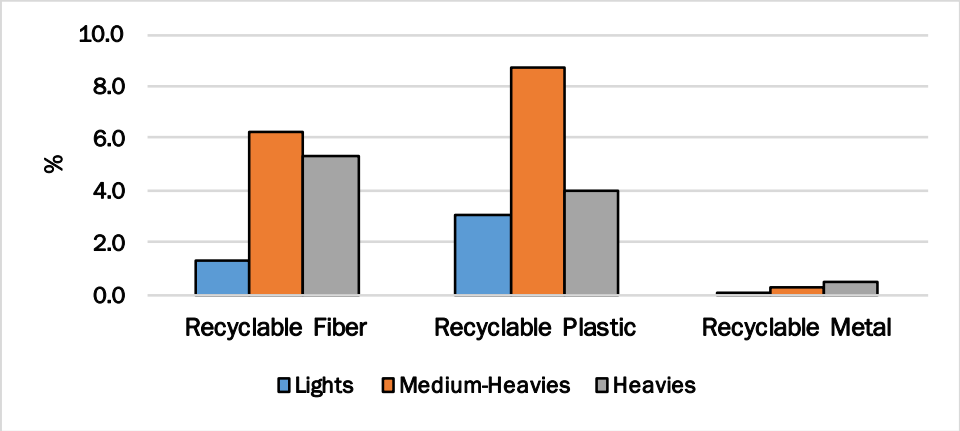


Figure 3.14 shows the proportion of non-recyclable materials compared for the three waste fractions. It shows that non-recyclable fiber and non-recyclable plastic were most prominent for “medium-heavies”, followed by “heavies”. Non-recyclable metal and glass waste proportions were most prominent for “heavies”, with no glass or metal found in the “lights” fraction.

Figure 3.14 Comparison of Non-Recyclable Material in Waste Fractions

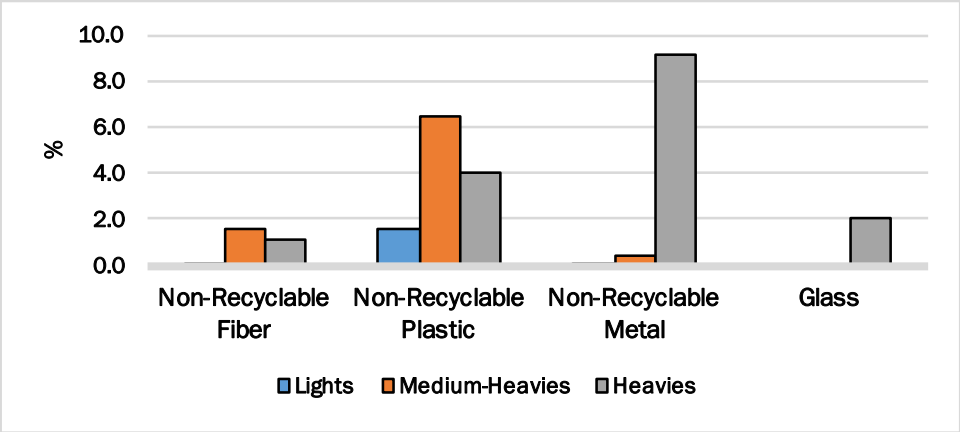


Figure 3.15 shows the proportion of residual materials compared for the three waste fractions. It shows that there is a considerable amount of textiles, which are most prominent in “medium-heavies” fraction. The amount of Other residuals increases with waste fraction.

Figure 3.15 Comparison of Residual Material in Waste Fractions

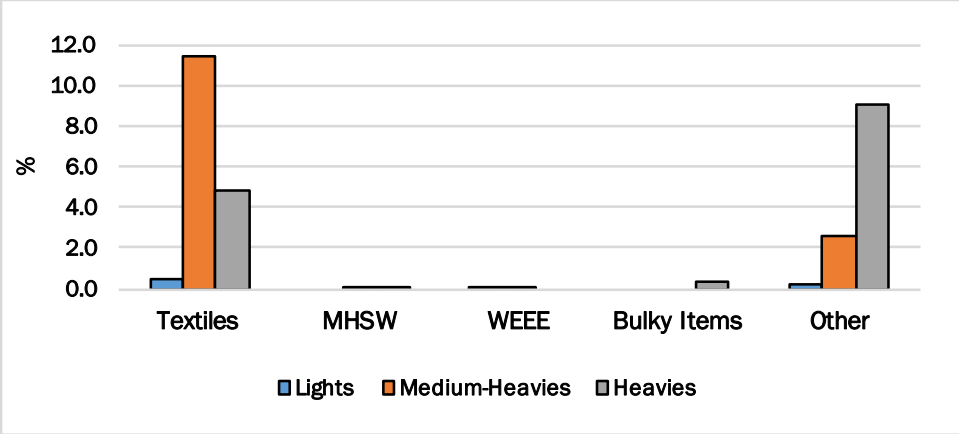


Figure 3.16 shows the proportion of organic materials compared for the two waste fractions. It shows that organic waste and sanitary & pet waste proportions increased as wastes became heavier.

Figure 3.16 Comparison of Organic Material in Waste Fractions

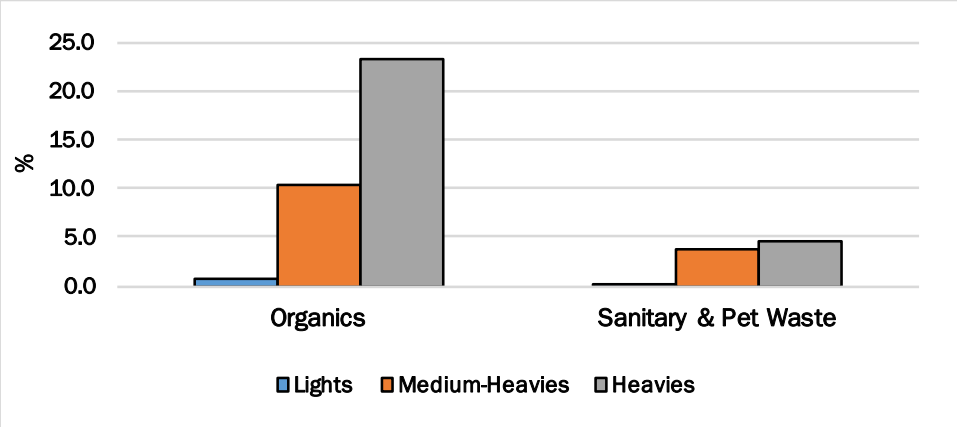


Figure 3.17 shows the proportion of construction materials compared for the two waste fractions. It shows that C&D and tires & rubber are most prominent in the “medium-heavies” waste stream. No ceramic was found in curbside & multi-residential waste.

Figure 3.17 Comparison of Construction Material in Waste Fractions

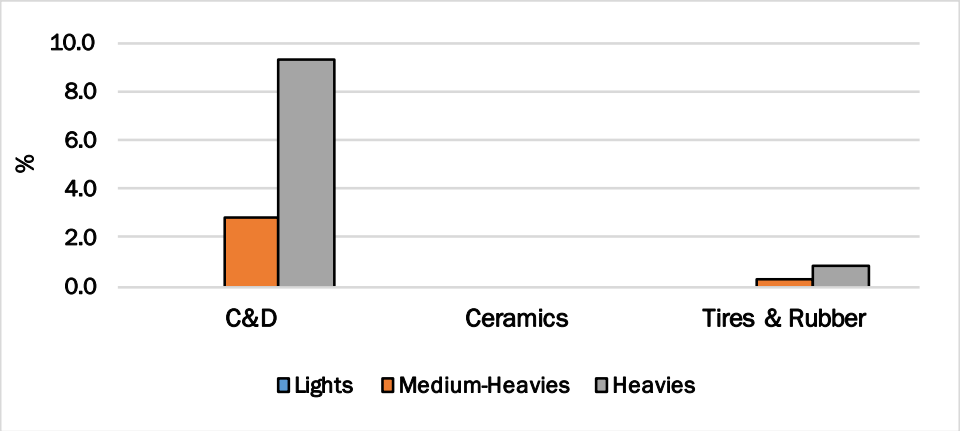
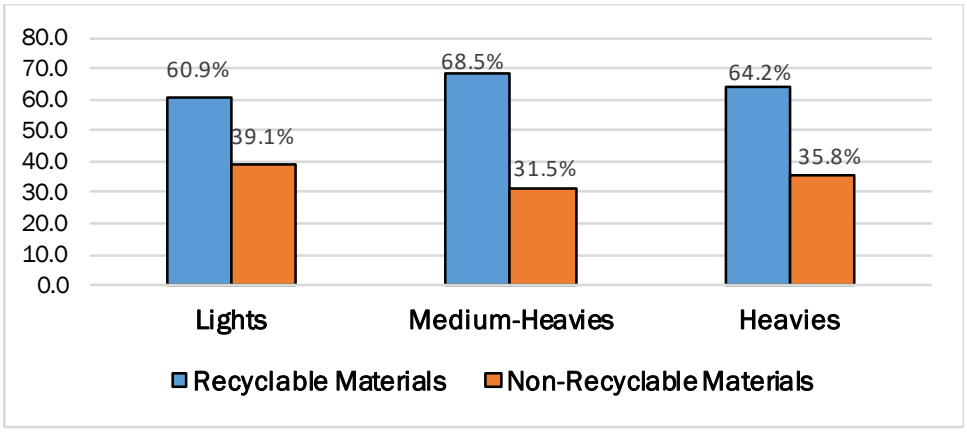


Figure 3.18 shows the overall proportion of recyclable and non-recyclable materials compared for the two waste fractions. It shows that the highest amount of recyclable materials occurred in the medium-heavies fraction. However, all fractions had more than 60% of potentially recyclable materials.

Figure 3.18 Overall Comparison of Recyclable Vs. Non-Recyclable Materials in Waste Fractions



4.0 Summary

2cg staff collected and sorted 24 samples weighing a total of 368.22 kg from three waste fractions:

- All three waste fraction samples were collected directly off the line using an approximate 1-3 cubic metre bin by Canada Fibers staff, with sub-samples extracted by 2cg staff;
- The curbside “lights” sub-samples were primarily composed of: recyclable plastic (24.7%), non-recyclable plastic (23.0%) and organics (13.6%);
- The curbside & multi-residential “lights” sub-samples were primarily composed of: recyclable plastic (34.6%), non-recyclable plastic (17.6%), and fines (17.3%);
- The curbside “medium-heavies” sub-samples were primarily composed of: textiles (22.0%), fines (16.3%), and recyclable plastic (10.7);
- The curbside & multi-residential “medium-heavies” sub-samples were primarily composed of: textiles (17.7%), organics (16.4%) and recyclable plastic (13.6%);
- The curbside “heavies” sub-samples were primarily composed of: organics (18.8%), textiles (15.6%) and recyclable fiber (12.1%);
- The curbside & multi-residential “heavies” sub-samples were primarily composed of: organics (26.7%), C&D (10.9%), other waste (10.4%) and non-recyclable metals (10.7%);
- The curbside “lights” fraction contained approximately 59% divertible material, the “medium- heavies” contained approximately 63% divertible material, and the “heavies” fraction contained approximately 76% divertible material.
- The curbside & multi-residential “lights” contained approximately 61% divertible material, the “medium- heavies” contained approximately 69% divertible material, and the “heavies” fraction contained approximately 64% divertible material

Appendix 1

Table 3.1- Curbside Light Fraction Sample Sort Results

"Lights" Fractions Sorting	Sample Number											
	%											
Category	1	2	3	4	5	6	7	8	9	Average	Min	Max
Recyclable Fiber	14.3	6.7	14.6	12.7	9.8					11.6	6.7	14.6
Non-Recyclable Fiber	1.5	1.9	1.2	2.6	5.6					2.6	1.2	5.6
Recyclable Plastic	18.4	22.4	28.5	27.9	26.5					24.7	18.4	28.5
Non-Recyclable Plastic	39.5	17.8	16.3	20.0	21.6					23.0	16.3	39.5
Recyclable Metals	0.0	0.0	0.2	0.0	0.0					0.0	0.0	0.2
Non-Recyclable Metals	0.2	0.4	0.0	0.2	0.6					0.3	0.0	0.6
Glass	0.0	0.0	0.0	0.0	0.0					0.0	0.0	0.0
Organics	9.4	24.5	10.0	14.7	9.4					13.6	9.4	24.5
Sanitary & Pet Waste	1.9	3.3	2.4	5.3	1.4					2.9	1.4	5.3
C&D	0.0	0.0	0.7	0.0	0.0					0.1	0.0	0.7
Ceramics	0.0	0.0	0.0	0.0	0.0					0.0	0.0	0.0
Tires & Rubber	0.0	0.0	0.0	0.0	0.0					0.0	0.0	0.0
Textiles	6.1	8.4	0.2	1.1	12.0					5.6	0.2	12.0
MHSW	0.0	0.0	0.0	0.0	0.0					0.0	0.0	0.0
WEEE	0.0	0.0	0.0	0.2	0.0					0.0	0.0	0.2
Bulky Items	0.0	0.0	0.0	0.0	0.0					0.0	0.0	0.0
Other	0.2	2.1	1.5	0.2	0.0					0.8	0.0	2.1
Fines	8.5	12.6	24.1	15.1	13.0					14.7	8.5	24.1
TOTAL	100.0	100.0	100.0	100.0	100.0	0.0	0.0	0.0	0.0	25.0	0.0	100.0

Table 3.2- Curbside & Multi-Residential "Lights" Sample Sort Results

"Lights" Fractions Sorting	Sample Number											
	%											
Category	1	2	3	4	5	6	7	8	9	Average	Min	Max
Recyclable Fiber	14.2	14.5	10.9							13.2	10.9	14.5
Non-Recyclable Fiber	1.0	3.0	1.7							1.9	1.0	3.0
Recyclable Plastic	31.8	38.7	33.1							34.6	31.8	38.7
Non-Recyclable Plastic	16.1	19.4	17.2							17.6	16.1	19.4
Recyclable Metals	0.6	0.0	0.4							0.3	0.0	0.6
Non-Recyclable Metals	0.4	0.2	0.0							0.2	0.0	0.4
Glass	0.0	0.0	0.0							0.0	0.0	0.0
Organics	8.8	8.6	10.7							9.3	8.6	10.7
Sanitary & Pet Waste	1.5	0.4	2.7							1.5	0.4	2.7
C&D	0.0	0.0	0.0							0.0	0.0	0.0
Ceramics	0.0	0.0	0.0							0.0	0.0	0.0
Tires & Rubber	0.0	0.0	0.0							0.0	0.0	0.0
Textiles	5.2	0.0	0.2							1.8	0.0	5.2
MHSW	0.0	0.0	0.0							0.0	0.0	0.0
WEEE	0.2	0.0	0.2							0.1	0.0	0.2
Bulky Items	0.0	0.0	0.0							0.0	0.0	0.0
Other	2.7	0.6	3.1							2.1	0.6	3.1
Fines	17.4	14.7	19.8							17.3	14.7	19.8
TOTAL	100.0	100.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0	0.0	100.0

Table 3.3- Curbside "Medium-Heavies" Sample Sort Results

"Medium-Heavies" Fractions Sorting	%											
Category	1	2	3	4	5	6	7	8	9	Average	Min	Max
Recyclable Fiber	7.7	10.9	8.0	13.2						10.0	7.7	13.2
Non-Recyclable Fiber	21.9	2.1	1.7	2.1						7.0	1.7	21.9
Recyclable Plastic	5.7	18.3	8.9	10.0						10.7	5.7	18.3
Non-Recyclable Plastic	6.7	9.9	16.7	7.0						10.1	6.7	16.7
Recyclable Metals	0.4	0.7	0.0	0.4						0.4	0.0	0.7
Non-Recyclable Metals	1.6	1.0	1.4	1.1						1.3	1.0	1.6
Glass	0.0	0.0	0.0	0.0						0.0	0.0	0.0
Organics	12.9	10.6	10.8	10.2						11.1	10.2	12.9
Sanitary & Pet Waste	7.5	7.1	4.9	8.3						6.9	4.9	8.3
C&D	1.3	1.7	0.6	1.9						1.3	0.6	1.9
Ceramics	0.0	0.0	0.0	0.0						0.0	0.0	0.0
Tires & Rubber	0.0	0.0	0.8	0.1						0.2	0.0	0.8
Textiles	14.6	26.7	26.3	20.6						22.0	14.6	26.7
MHSW	0.0	0.0	0.0	0.0						0.0	0.0	0.0
WEEE	0.4	0.0	0.0	0.0						0.1	0.0	0.4
Bulky Items	0.0	0.0	0.0	0.9						0.2	0.0	0.9
Other	2.8	0.4	2.5	3.3						2.3	0.4	3.3
Fines	16.5	10.5	17.3	20.9						16.3	10.5	20.9
TOTAL	100.0	100.0	100.0	100.0	0.0	0.0	0.0	0.0	0.0	20.0	0.0	100.0

Table 3.4- Curbside & Multi-Residential "Medium-Heavies" Sample Sort Results

"Medium-Heavies" Fractions Sorting	Sample Number											
	%											
Category	1	2	3	4	5	6	7	8	9	Average	Min	Max
Recyclable Fiber	8.9	11.3	10.2	8.8						9.8	8.8	11.3
Non-Recyclable Fiber	1.2	2.3	2.1	4.0						2.4	1.2	4.0
Recyclable Plastic	11.8	13.0	16.2	13.5						13.6	11.8	16.2
Non-Recyclable Plastic	8.9	9.7	14.1	8.1						10.2	8.1	14.1
Recyclable Metals	0.1	0.7	0.4	0.5						0.4	0.1	0.7
Non-Recyclable Metals	0.1	0.0	1.3	1.0						0.6	0.0	1.3
Glass	0.0	0.0	0.0	0.0						0.0	0.0	0.0
Organics	17.5	10.8	22.9	14.5						16.4	10.8	22.9
Sanitary & Pet Waste	5.6	5.7	7.4	4.9						5.9	4.9	7.4
C&D	2.8	5.3	2.3	6.7						4.3	2.3	6.7
Ceramics	0.0	0.0	0.0	0.0						0.0	0.0	0.0
Tires & Rubber	1.1	0.0	0.4	0.0						0.4	0.0	1.1
Textiles	25.5	10.1	15.4	19.7						17.7	10.1	25.5
MHSW	0.0	0.4	0.1	0.1						0.2	0.0	0.4
WEEE	0.5	0.0	0.1	0.1						0.2	0.0	0.5
Bulky Items	0.0	0.0	0.0	0.0						0.0	0.0	0.0
Other	1.9	6.7	0.5	6.7						4.0	0.5	6.7
Fines	14.0	23.9	6.6	11.3						13.9	6.6	23.9
TOTAL	100.0	100.0	100.0	100.0	0.0	0.0	0.0	0.0	0.0	20.0	0.0	100.0

Table 3.5- Curbside "Heavies" Sample Sort Results

"Heavies" Fractions Sorting	Sample Number										
	%										
Category	1	2	3	4	5	6	7	8	Average	Min	Max
Recyclable Fiber	11.9	14.6	14.3	7.7					12.1	7.7	14.6
Non-Recyclable Fiber	3.7	1.8	0.5	4.7					2.7	0.5	4.7
Recyclable Plastic	4.0	4.7	6.8	7.1					5.7	4.0	7.1
Non-Recyclable Plastic	6.0	3.5	6.6	6.6					5.7	3.5	6.6
Recyclable Metals	0.3	0.0	0.2	1.1					0.4	0.0	1.1
Non-Recyclable Metals	0.1	3.6	2.7	0.0					1.6	0.0	3.6
Glass	0.4	0.1	0.0	0.7					0.3	0.0	0.7
Organics	19.1	18.0	15.9	22.1					18.8	15.9	22.1
Sanitary & Pet Waste	7.9	12.1	11.4	0.0					7.8	0.0	12.1
C&D	9.3	13.2	12.0	10.4					11.2	9.3	13.2
Ceramics	2.3	0.9	0.5	0.0					0.9	0.0	2.3
Tires & Rubber	0.4	1.7	0.0	11.5					3.4	0.0	11.5
Textiles	17.6	13.4	19.3	12.1					15.6	12.1	19.3
MHSW	0.0	0.0	0.1	0.0					0.0	0.0	0.1
WEEE	0.5	0.0	0.0	0.0					0.1	0.0	0.5
Bulky Items	0.0	0.0	1.5	0.0					0.4	0.0	1.5
Other	2.5	1.2	0.6	2.9					1.8	0.6	2.9
Fines	13.9	11.1	7.5	13.0					11.4	7.5	13.9
TOTAL	100.0	100.0	100.0	100.0	0.0	0.0	0.0	0.0	20.0	0.0	100.0

Table 3.6- Curbside & Multi-Residential "Heavies" Sample Sort Results

"Heavies" Fractions Sorting	Sample Number											
	%											
Category	1	2	3	4	5	6	7	8	9	Average	Min	Max
Recyclable Fiber	0.0	0.0	11.4	13.7						6.3	0.0	13.7
Non-Recyclable Fiber	0.0	0.0	3.0	2.2						1.3	0.0	3.0
Recyclable Plastic	0.0	1.8	8.8	8.5						4.7	0.0	8.8
Non-Recyclable Plastic	2.4	4.3	5.3	6.6						4.7	2.4	6.6
Recyclable Metals	0.0	0.0	1.6	0.7						0.6	0.0	1.6
Non-Recyclable Metals	29.1	8.8	3.2	1.6						10.7	1.6	29.1
Glass	4.2	4.2	0.0	1.0						2.3	0.0	4.2
Organics	20.6	47.7	15.7	22.9						26.7	15.7	47.7
Sanitary & Pet Waste	0.0	0.0	13.7	8.6						5.6	0.0	13.7
C&D	21.4	5.8	9.7	6.9						10.9	5.8	21.4
Ceramics	0.0	0.0	0.0	0.0						0.0	0.0	0.0
Tires & Rubber	0.7	3.1	0.0	0.0						0.9	0.0	3.1
Textiles	0.0	0.0	13.1	9.9						5.7	0.0	13.1
MHSW	0.0	0.0	0.1	0.0						0.0	0.0	0.1
WEEE	0.0	0.0	0.0	0.0						0.0	0.0	0.0
Bulky Items	0.0	0.9	0.0	0.6						0.4	0.0	0.9
Other	17.7	19.4	2.5	2.0						10.4	2.0	19.4
Fines	4.0	4.1	11.9	14.9						8.7	4.0	14.9
TOTAL	100.0	100.0	100.0	100.0	0.0	0.0	0.0	0.0	0.0	20.0	0.0	100.0

Appendix 2

“Audit Fines” Category Visual Analysis

For the purpose of this particular waste audit, the sorting category of “audit fines” is used to describe material that is typically less than 1.0cm in size and impossible to sort into other waste categories because they are wet and/or soiled. Typically, the most prominent source of “audit fines” in all waste fractions are miniscule pieces of plastic, metal, textile and fiber that is combined and saturated with shredded organic waste and pet & sanitary waste to the point of being indistinguishable from one another. The photo below demonstrates the saturated nature, size and composition of typical fines found in all waste streams. The condition of this material does not vary as waste fractions get heavier.

Photo 7.“Fines” Category

HIGH DIVERSION MRF PILOT RESULTS

August 2017

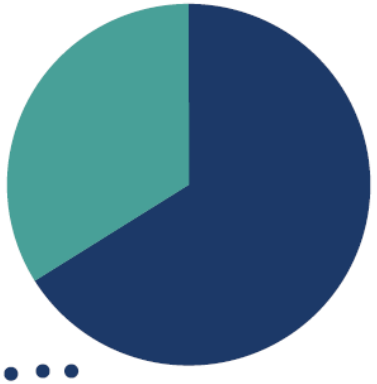
Preliminary results from pilot to assess viability of recovering resources from City of London's mixed solid waste stream.

Canada Fibers Ltd.
Mining Urban Resources

London
CANADA

Overall Recovery Rate

We were able to recover **34%** of the material discarded by residents in the garbage.



34%

Recovered Fraction

Recovered material includes organics, metal and plastic.

66 %

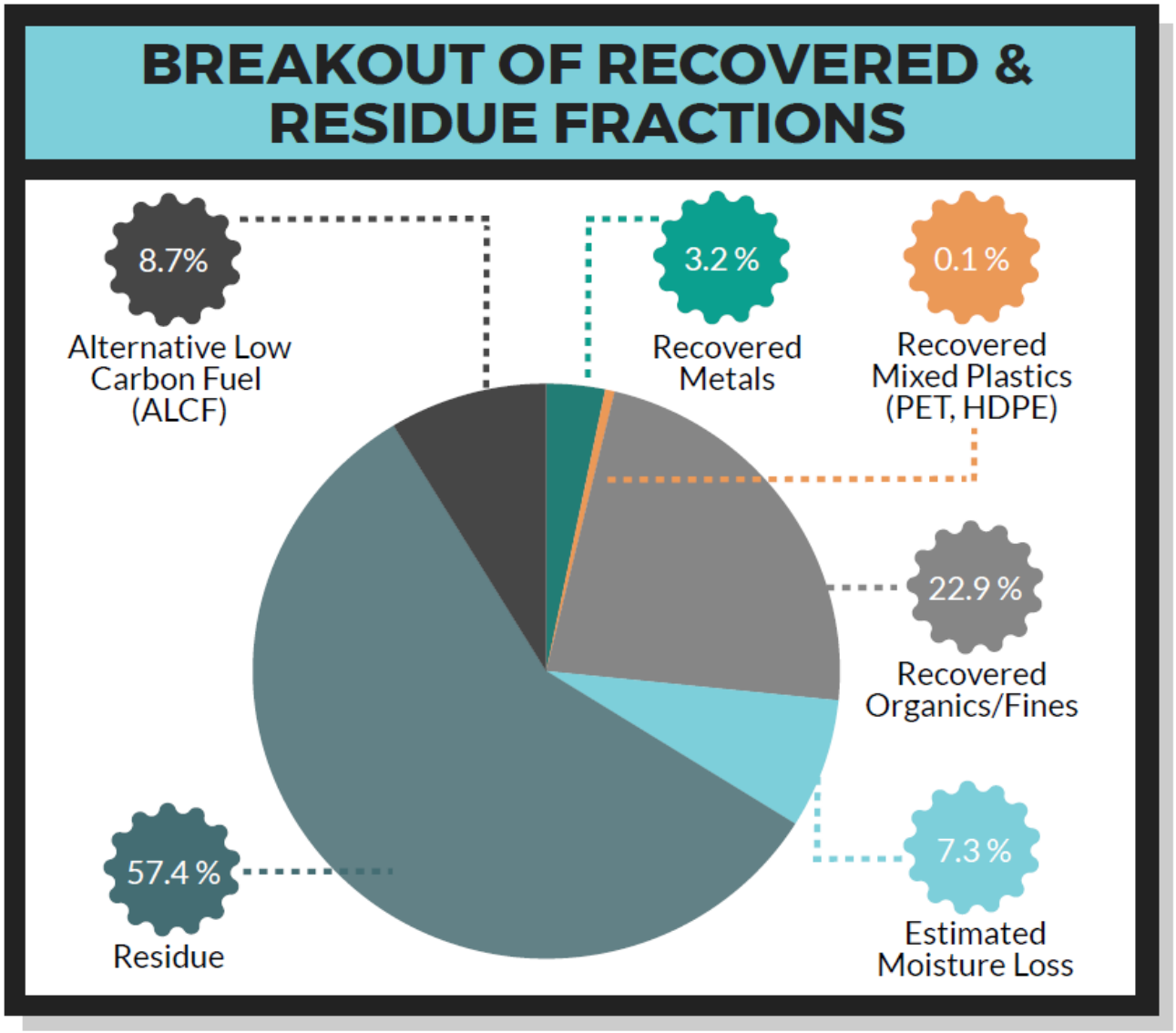
Residue Fraction

Residue consists of traditional residue and alternative low carbon fuel (ALCF).

368 MT

Inbound Tonnage

City of London brought in 368 MT to be processed at the HD MRF in August 2017. The material was from single family homes without a source-separated organics program.


BREAKOUT OF RECOVERED & RESIDUE FRACTIONS
8.7%
Alternative Low Carbon Fuel (ALCF)
3.2 %
Recovered Metals
0.1 %
Recovered Mixed Plastics (PET, HDPE)
22.9 %
Recovered Organics/Fines
7.3 %
Estimated Moisture Loss
57.4 %
Residue

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