Waste Management Working Group
Report

3rd Meeting of the Waste Management Working Group
July 13, 2018
Committee Room #1

Attendance

PRESENT: Councillor M. van Holst (Chair); Mayor M. Brown; Councillors J. Helmer and S. Turner and J. Bunn (Secretary)

ABSENT: Councillors M. Cassidy and H. Usher

ALSO PRESENT: W. Abbott, M. Losee and J. Stanford

The meeting was called to order at 12:00 PM.

1. Call to Order

1.1 Disclosures of Pecuniary Interest

That it BE NOTED that no pecuniary interests were disclosed.

2. Scheduled Items

2.1 Decision Report #8 – 60% Waste Diversion Action Plan

That, on the recommendation of the Director, Environment, Fleet and Solid Waste, the following actions be taken with respect to the 60% Waste Diversion Action Plan:

a) the staff report dated July 13, 2018, with respect to the 60% Waste Diversion Action Plan, BE RECEIVED;

b) the action plan to achieve 60% waste diversion by 2022 BE SUPPORTED IN PRINCIPLE; and,

c) the release of the above-noted Action Plan for review and comment by the general public and other stakeholders BE SUPPORTED; it being noted that minor changes/revisions to the report may be made prior to release to improve readability or layout of the report;

it being noted that the attached presentation from J. Stanford, Director, Environment, Fleet and Solid Waste, with respect to this matter, was received.

3. Consent

3.1 2nd Report of the Waste Management Working Group

That it BE NOTED that the 2nd Report of the Waste Management Working Group, from its meeting held on March 8, 2018, was received.

3.2 Update Report #10 - Draft Proposed Terms of Reference

That it BE NOTED that the staff report dated July 13, 2018, with respect to an update report (#10) related to the Draft Proposed Terms of Reference for the Environmental Assessment of the Proposed W12A Landfill Expansion for the City of London, was received.

4. Items for Discussion

None.

5. Deferred Matters/Additional Business

None.

6. Adjournment

The meeting adjourned at 1:12 PM.

TO:	**CHAIR AND MEMBERS WASTE MANAGEMENT WORKING GROUP MEETING ON JULY 13, 2018**
FROM:	**JAY STANFORD, M.A., M.P.A. DIRECTOR - ENVIRONMENT, FLEET & SOLID WASTE**
SUBJECT:	**DECISION REPORT #8: 60% WASTE DIVERSION ACTION PLAN**

RECOMMENDATION

That, on the recommendation of the Director - Environment, Fleet and Solid Waste, the following actions **BE TAKEN** with respect to the 60% Waste Diversion Action Plan:

a) The Report **BE RECEIVED** for information;

b) The action plan to achieve 60% waste diversion by 2022 **BE SUPPORTED IN PRINCIPLE;** and,

c) The release of the report for review and comment by the general public and other stakeholders **BE SUPPORTED** noting that minor changes/revisions to the report may be made prior to release to improve readability or layout of the report.

PREVIOUS REPORTS PERTINENT TO THIS MATTER

Relevant reports that can be found at www.london.ca under City Hall (Meetings) include:

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

Relevant reports that can be found at www.london.ca under City Hall (Meetings – Advisory and other Committees) include:

- Background Report #3 - Development of 60% Waste Diversion Action Plan (March 8, 2018 meeting of the Waste Management Working Group (WMWG), Item #3.3)
- Update Report #8 - Programs, Projects and Provincial Activities that will Inform and/or Influence Strategies (January 18, 2018 meeting of the WMWG, Item #8)
- Update Report #5 - Programs, Projects and Provincial Activities that will Inform and/or Influence Strategies (September 28, 2017 meeting of the WMWG, Item #7)
- Update Report #2 - Programs, Projects and Provincial Activities that will Inform and/or Influence Strategies (June 14, 2017 meeting of the WMWG, Item #8)
- Update Report #1 - Resource Recovery Update (January 19, 2017 meeting of the WMWG, Item #7)

COUNCIL'S 2015-2019 STRATEGIC PLAN

Municipal Council has recognized the importance of solid waste management in its 2015-2019 - Strategic Plan for the City of London (2015 – 2019 Strategic Plan) as follows:

Building a Sustainable City
- Strong and healthy environment
- Robust infrastructure

Leading in Public Service
- Proactive financial management

Growing our Economy

- Local, regional, and global innovation
- Strategic, collaborative partnerships
- Innovative & supportive organizational practices
- Collaborative, engaged leadership
- Excellent service delivery

BACKGROUND

PURPOSE

This report provides the Waste Management Working Group with an overview of the 60% Waste Diversion Action Plan (Action Plan) and seeks support for releasing the report for review and comment by the general public and other stakeholders.

CONTEXT

In London, more than one tonne of waste is produced annually per person. This includes waste generated at home as well as waste generated by the industrial, commercial and institutional (IC&I) sectors. About a third of this waste is diverted through numerous waste reduction, reuse, recycling and composting programs. The overall waste diversion rate for London is between 30% and 35%. The residential (household) diversion rate is 45%.

To plan for the future, the City is developing a long term Resource Recovery Strategy. The Resource Recovery Strategy involves the development of a plan to maximize waste reduction, reuse, recycling and resource recovery in an economically viable and environmentally responsible manner. The Resource Recovery Strategy includes a commitment by City council to increase the residential waste diversion rate to 60% by 2022. This commitment was made at the October 30, 2017 City Council meeting by passing the following resolution:

> *"The W12A Landfill expansion be sized assuming the residential waste diversion rate is 60% by 2022 noting this does not prevent increasing London's residential waste diversion rate above 60% between 2022 and 2050."*

This 60% waste diversion goal will be included in the environmental assessment as part of the commitments made by the City. It will be a key consideration in the Ministry of the Environment, Conservation and Parks (formerly called the Ministry of the Environment and Climate Change) approval of the environmental assessment for expansion of the W12A Landfill.

Other key documents (Appendix A) that highlight waste diversion and resource recovery and provide further context for the 60% Waste Diversion Action Plan include:

- Strategic Plan for the City of London (2015-2019)
- The London Plan (December 28, 2016)
- Provincial Government A Strategy for Waste-Free Ontario – Building a Circular Economy (February 2017)
- Provincial Government Food and Organic Waste Framework (April 2018)

Key considerations in the development of the 60% waste diversion goal were:

- A 60% diversion rate being a practical limit in Ontario at this time based on the following: many municipalities with a Green Bin program divert between 50% and 55%; about three municipalities have diversion rates around 60% (Simcoe County, Dufferin County, City of Kingston); and only the Region of York (including the City of Markham) have pushed to higher levels;
- Feedback received from residents; and
- Increasing from the current 45% diversion to 60% diversion represents a 33% improvement which is a significant undertaking.

The overall Resource Recovery Strategy will look at the longer term steps the City could take to move beyond 60% waste diversion.

DISCUSSION

60% Waste Diversion Action Plan – Proposed Actions

The 60% Waste Diversion Action Plan proposes a set of actions to achieve 60% diversion of residential waste in 2022. These actions are summarized in Table 1.

Table 1 - Proposed Actions to Achieve 60% Residential Waste Diversion

Blue Box (Blue Cart) Programs
1. Increase capture of recyclables from 63% to 75% (less placed in garbage)
New (or Expanded) Recycling Programs and Initiatives
2. Bulky Plastics a) Continue with existing pilot project b) Consider implementation of an expanded program once long-term, stable markets have developed 3. Carpets a) Wait to see if the Province develops a provincial program for carpets under the Waste-Free Ontario Act as there are limited markets for recycling carpets in the province b) If no provincial program exists by 2021, implement a pilot project 4. Ceramics a) Provide a drop-off location for ceramics at no cost at the City's EnviroDepots b) Ban collection of toilets at the curb 5. Clothing and Textiles a) Develop a textile awareness strategy to promote existing reuse opportunities for all Londoners b) Pilot depot collection at select multi-residential buildings 6. Small Metal (Small Appliances/Electrical Tools/Scrap Metal) a) Implement semi-annual curbside collection of small metal items b) Pilot depot collection at select multi-residential buildings 7. Furniture a) Begin semi-annual collection of wooden furniture b) Provide a drop-off location at W12A EnviroDepot for wooden furniture c) Ban wooden furniture from curbside garbage collection 8. Mattresses a) Wait to see if the Province develops a provincial program for mattresses under the Waste-Free Ontario Act as there are limited markets for recycling mattresses in the province b) If no provincial program exists by 2021, implement a pilot project
Curbside Organics Management Program
9. Implement a curbside (residential) Green Bin program 10. Implement bi-weekly (same day) garbage collection
Multi-Residential Organics Management Program
11. Implement a mixed waste processing pilot (to recover organics and other materials) on a portion of the waste from multi-residential homes
Other Organics Management Programs
12. Develop and implement a food waste avoidance strategy 13. Reduce the cost of composters at the EnviroDepots and undertake additional sale events at select community locations 14. Provide financial support to community groups or environmental organizations that want to set up a community composting program

table continued

Table 1 - Proposed Actions to Achieve 60% Residential Waste Diversion

Waste Reduction and Reuse Initiatives and Policies
15. Create a Waste Reduction and Reuse Coordinator position within the Solid Waste Management Division 16. Provide financial support for community waste reduction and reuse initiatives 17. Reduce the container limit to two or three containers per collection when the Green Bin program with bi-weekly garbage collection is operational 18. Further explore the use of clear bags for garbage collection if London does not move to a roll-out cart based garbage collection system 19. Further explore a full user pay garbage system if London moves to a roll-out cart based garbage collection system 20. Further examine other incentive and disincentive initiatives (best practices) from other municipalities (e.g., mandatory recycling by-law, reward systems, user fees, etc.) 21. Provide additional feedback approaches to residents (including how waste reduction and waste diversion are calculated when providing waste management progress reports)

List of Benefits and Costs of 60% Waste Diversion

By taking the steps outlined in this Action Plan, a number of environmental, social and financial benefits will be achieved including:

- increased waste diversion (33% more diversion),
- creation of jobs (between 125 and 170 direct and indirect; within and outside London),
- reduced greenhouse gas (GHG) emissions (about 17,000 to 27,000 tonnes per year, equivalent of removing 4,200 to 6,800 cars from the road),
- reduced landfill impacts (less odourous materials being landfilled, less traffic, etc.),
- better use of materials and resources,
- residents will feel satisfaction/pride living in an environmentally progressive community, and
- short-term landfill cost savings.

It is expected that approval of any expansion of the landfill by the MOECP would be unlikely unless the City has programs in place to achieve 60% waste diversion. If the City does not receive approval to expand the landfill, the increase in disposal costs will be significant as the City would have to export its waste to a private landfill elsewhere in Ontario. The increase in disposal costs for the City to export its waste is estimated to be approximately $5 to $7 million per year.

Waste Diversion Rates, Estimated Operating Costs and Schedule

The approximate cost, expected diversion rate and timeline for implementation for the proposed actions are summarized on Table 2.

<u>Green Bin Collection & Processing versus Mixed Waste Collection & Processing</u>

A comparison of a Green Bin program versus a mixed waste processing program for managing curbside organics is presented in Table 3.

A curbside Green Bin program is recommended because more evidence is required on mixed waste processing in Ontario before the uncertainty around the technical and regulatory risks can be removed. For all the recent progress made in the field of mixed waste processing, there are as many if not more examples that highlight the challenges of this approach. For these reasons, City staff is recommending to proceed with a pilot project in the multi-residential sector and continued monitoring of mixed waste processing work undertaken in a few Ontario municipalities (e.g., Region of Peel, City of Toronto, Region of Durham, County of Oxford).

Table 2 - Summary of Diversion, Estimated Operating Costs and Schedule

Program Category	Diversion Rate		Annual Estimated Operating Cost			Schedule
	Range	Likely	Range	Likely	$/Hhld[a]	
Blue Box Recycling Improvements	1% - 3%	2%	$0	$0	$0	Likely not under City control[b] in the future
New Recycling Programs and Initiatives	0.4% - 0.8%	0.6%	$350,000 - $550,000	$450,000	$2.00 - $3.00	2019[c] – 2021
Curbside Organics Management Program	8% - 12%	10%	$3,900,000 - $5,500,000	$5,000,000	$21.75 - $30.50	2020 – 2022
Multi-Residential Organics Management Pilot Program	0.5% - 0.7%	0.6%	$400,000 - $700,000	$500,000	$2.25 – 4.00	2020
Other Organic Management Programs	0.3%- 0.6%	0.4%	$250,000 - $350,000	$300,000	$1.50 – $2.00	2019[c] – 2021
Waste Reduction, Reuse Initiatives and Policies	1% – 4%	1.4%	$150,000 - $350,000	$250,000	$1.00 - $2.00	2019[c] – 2021
Total[d]	**11% - 21%**	**15%**	**$5,050,000 - $7,450,000**	**$6,500,000 ($36.00)**	**$28.00 - $41.50**	**2019[c] – 2022**

Notes:

a) Based on 180,000 households.

b) The provincial Waste-Free Ontario Strategy calls for a transition from the current Blue Box program, which is municipally managed and co-funded by industry and municipalities, toward a full EPR program by 2023. The EPR program will require producers to take full financial and operational responsibility for all Ontario municipal Blue Box programs.

c) 2019 Multi-year budget has $140,000 assigned to new waste diversion initiatives.

d) Totals may not add due to rounding.

Table 3 – Comparison of Green Bin and Mixed Waste Processing Programs

Factor	Comment
Environmental	• A mixed waste processing program potentially captures 25% to 80% more organics, reduces greenhouse gases (GHG) by a corresponding amount and opens up the possibility of producing solid recovered fuel.
Financial	• A Green Bin program costs approximately $30 to $45 per year to service a curbside household (about 125,000 households; not all 180,000 households as in Table 2) compared to $70 to $115 per year to undertake mixed waste processing for the same households.
Social	• Mixed waste processing program offers more convenience to residents (no change to how they manage waste).

Table 3 – Comparison of Green Bin and Mixed Waste Processing Programs

Factor	Comment
Technical	• The rules and regulations around mixed waste processing are evolving as current regulations do not explicitly address mixed waste processing. • There is limited experience with mixed waste processing in Canada. Past experience has not been positive in Canada and parts of North America. Facilities have either been closed (e.g., Three County (Total Recycling) System, Aylmer, Ontario; Plasco Energy Group, Ottawa, Ontario; SUBBOR, Guelph, Ontario; Dongara Pellet Plant, Vaughan, Ontario; Conporec Integrated Waste Management & Composting, Sorel-Tracy, Quebec; and several facilities in the United States) or retooled away from partially mixed waste processing or similar systems to source separated systems (e.g., City of Guelph wet/dry recycling; City of Moncton wet/dry recycling). This includes a recent decision in the City of Edmonton (March 2018) not to re-open its mixed waste processing facility in favour of progressing with a source separated organics collection program. • Modern mixed waste processing systems in Europe appear to have addressed many of the earlier challenges; however, the track record in North America is very limited at this time. This is expected to change in the next two to five years. • Green Bin is the preferred method in the provincial Food and Organic Waste Framework and Policy Statement.

The current estimated capital cost of a Green Bin program is $12 million with an estimated annual operating cost range from $3.5 to $5.0 million depending on type of Green Bin program implemented (e.g., how will pet waste, diapers, be handled, etc.) and processing costs. Previous cost estimates for a Green Bin program include: initial capital of $12,000,000 and on-going annual operating costs of $3,900,000. These estimates were based on a weekly collection of organics comprised of food waste and tissues/paper toweling (diapers/sanitary products would not be included) and a bi-weekly collection of garbage.

It is expected that the cost of mixed waste processing may decrease in the future because of improved technology and potential revenues from producing renewable natural gas from the organics.

In the future, a mixed waste processing program may be preferred if the technical and regulatory risks are addressed. For this reason, it is recommended that the City's Green Bin program be designed to offer the flexibility to transition to a mixed waste processing program in the future. Flexibility can be achieved by the City:

- Not building its own processing facility for the organics from the Green Bin Program or entering into a long term contract (e.g., eight or more years) for processing capacity; and,

- Having the processing contract(s) match the expected service life of the trucks (about seven years).

Financial Considerations – Funding 60% Waste Diversion

<u>Partially Offsetting Operating Costs</u>
As shown in Table 2, annual operating costs for the 60% Waste Diversion Action Plan will range from $5.05 million to $7.45 million and will depend on final program design, market competition, etc. The most likely annual operating cost is estimated to be $6.5 million.

City staff continue to examine a number of financing approaches. The change in government in Ontario has created additional uncertainty as a number of potential revenue sources for waste diversion are on hold. Besides taxes, potential sources of revenue currently include:

- Additional recycling program costs paid by industry - potential cost savings from expected transition from the current Blue Box program, which is municipally managed and co-funded by industry and municipalities, toward a full EPR program paid 100% by industry by 2023. This is expected to reduce the City's current waste diversion program costs by $1.5 to $1.8 million. In addition there is the potential of one time capital funding for recycling infrastructure. It is not clear when full funding would be paid to the City.

- Other extended producer responsibility revenues - for items such as branded organics (e.g., diapers, soiled paper, tissues/toweling) carpets, textiles, furniture and other consumer goods. These sources could range between $50,000 and $150,000 per year.

- W12A Landfill levy to support diversion - a specific amount charged per tonne of garbage disposed of at the landfill that is placed in a dedicated fund for waste reduction and diversion. The amount that could be collected is based on many factors (e.g., which garbage is it applied to, what fee, etc.). Levies between $2 and $20 per tonne are in place in some jurisdictions. Revenue from this source could range between $250,000 and $1 million per year.

- Greenhouse gas offset credits associated with organics diversion – the Government of Ontario was working on introducing an emissions offset protocol for aerobic composting into Ontario's Cap & Trade program, based on an existing protocol used in Alberta (e.g., five composting projects currently listed on the Alberta Emissions Offset Registry). The value of these offsets would have been between $100,000 and $500,000 per year based on an assumed value of around $20 per tonne of GHG emissions offset (and increasing over time). It is unclear at this time how/if this funding opportunity will be replaced by the current provincial government.

A summary of estimated operating costs and potential annual funding is identified on Table 4.

Table 4 – Summary of Estimated Costs and Potential Funding

	Low	High	Likely (Anticipated)
Costs (Table 2)	$5,050,000	$7,450,000	$6,500,000
Revenues	$1,800,000	$2,950,000	$2,000,000
Total Estimated Costs			$4,500,000

Capital

Capital costs for the 60% Waste Diversion Action Plan will depend on program design, technology considerations, etc. The largest capital expenditure will be for the Green Bin Program. A capital cost of $12 million for the Green Bin program had previously been estimated (January 2016, Multi-year Budget deliberations). Other waste diversion initiatives listed in the Action Plan may require new investment in the order of $500,000 to $3 million for a total of $12.5 to $15 million in capital expenditures.

It is expected that capital costs for the 60% waste diversion action plan will be able to be funded from the existing capital budget. The current ten-year capital program includes $35 million in 2020 for new solid waste diversion technologies to increase diversion. After allocating up to $15 million for the Action Plan, there would be $20 million left for advanced waste diversion and/or resource recovery technologies.

Community Feedback – To the end of June 2018

The approaches used to engage the public and other stakeholders in the development of the 60% Waste Diversion Action Plan included open houses, booths at community events, interactions with City of London Advisory Committees, the WhyWaste Resource Recovery Strategy website, creation of the Waste Management Community Liaison Committee and newspaper and social media advertisements. The engagement started in April 2017.

One of the most recent engagement items was a waste diversion survey undertaken by Ipsos Public Affairs. In total, 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.

Under Key Findings, Ipsos notes that "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." Other key findings are found in Appendix B with the complete report included in the separate 60% Waste Diversion Action Plan.

Community Engagement – An Approach for Final Feedback

The following community engagement activities are proposed for the 60% Waste Diversion Action Plan (Table 5).

Table 5 – Community Engagement for Draft 60% Waste Diversion Action Plan

Date	Event	Comments
July 17	CWC Meeting	• Approve in Principle Draft Action Plan to achieve 60% waste diversion by 2022 • Approve to circulate and receive feedback on the 60% Waste Diversion Action Plan
July 24	Council	
July 25 to September 10	Provide feedback opportunities on WhyWaste Resource Recovery Strategy website	• Advertise in the London Free Press, The Londoner and on social media
	Circulate to Community Stakeholder Groups	• Circulate and ask for feedback from Waste Management Community Liaison, Committee (WMCLC), W12A Landfill Public Liaison Committee, Urban League and Advisory Committee on the Environment (ACE)
	Circulate to Waste Management/ Recycling Companies	• Circulate and ask for feedback from local companies including Emterra, Green Valley Recycling, Miller Waste, Orgaworld, StormFisher, Try Recycling, Waste Connections and Waste Management
	Festival	• Attend Gathering on the Green II, Sunday August 19, 2018
	Presentations	• Present to WMCLC in early August (TBD) • Present to ACE on September 5, 2018
September 27	Public Participation Meeting	• CWC receives comments from the public and other stakeholders
January/ February 2019	CWC Meeting	• Approval of 60% Waste Diversion Action Plan • Implementation details and final cost estimates to be provided at this time
	Council	

ACKNOWLEDGEMENTS

This report was prepared with assistance from Mike Losee, Division Manager, Solid Waste Management; Anne Boyd, Manager, Waste Diversion Programs; Jane Kittmer, Solid Waste Planning Coordinator; and Jessica Favalaro, Water Demand Technologist.

PREPARED BY:
WESLEY ABBOTT, P. ENG. **PROJECT MANAGER** **SOLID WASTE MANAGEMENT**

PREPARED AND RECOMMENDED BY:	**CONCURRED BY:**
JAY STANFORD, M.A., M.P.A. **DIRECTOR, ENVIRONMENT, FLEET & SOLID WASTE**	**KELLY SCHERR, P.ENG., MBA, FEC** **MANAGING DIRECTOR, ENVIRONMENTAL & ENGINEERING SERVICES & CITY ENGINEER**

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Appendix A Key Documents that Provide Context for the 60% Waste Diversion Action Plan

Appendix B Ipsos Public Affairs - Summary - City of London Waste Diversion survey

Attachment (full report under separate cover) 60% Waste Diversion Action Plan

APPENDIX A
Key Documents that Provide Context for the 60% Waste Diversion Action Plan

Key Documents	Extract from Document (all details in italics are verbatim – word-for-word)
Strategic Plan for the City of London (2015-2019)	***Building a Sustainable City*** *1. Robust Infrastructure* *What are we doing?* *Increase efforts on more resource recovery, long-term disposal capacity, and reducing community impacts of waste management.* *How are we doing it?* *Long-Term Waste Management Plan* ***Growing our Economy*** *3. Local, regional, and global innovation* *What are we doing?* *Lead the development of new ways to resource recovery, energy recovery, and utility and resource optimization with our local and regional partners to keep our operating costs low and assist businesses with commercialization to help grow London's economy.* *How are we doing it?* *London Waste to Resources Innovation Centre*
The London Plan (December 28, 2016)	***London 2025: Exciting Exceptional, Connected*** ***Key Directions*** ***Direction #4*** *Become one of the greenest cities in Canada* *#12 Minimize waste generation, maximize resource recovery, and responsibly dispose of residual waste.* ***Solid Waste Management*** *479_ The following policies are separated into two primary areas: Diversion and Disposal.* *>>DIVERSION - REDUCING, REUSING, RECYCLING, COMPOSTING AND RECOVERY* *480_ The City will promote the reduction, re-use, recycling, composting, and recovery of materials from solid waste, wherever possible, through the use of innovative means, new technology, conservation measures, and public education and community engagement programs.* *481_ The City will support the reduction, re-use, recycling, composting and recovery of materials by:* *1. Initiating, participating and collaborating in public education, awareness, and community engagement programs with residents, Londoners, businesses and other agencies and organizations.* *2. Collaborating with other municipalities to develop long-term strategies to reduce, reuse, recycle, and recover materials from the waste stream.* *3. Encouraging development proposals to provide adequate recycling and composting facilities, and support innovative waste collection and diversion programs.* *4. Increasing waste diversion through existing technologies and new, emerging and next-generation technologies as they become available, practical, and financially feasible for London.* *5. Exploring energy from waste opportunities.*

<table>
<tr><th>Key Documents</th><th>Extract from Document
(all details in italics are verbatim – word-for-word)</th></tr>
<tr><td></td><td>482_ In addition to municipal waste management facilities within the Waste Management Resource Recovery Area Place Type, City Council will support the adequate provision of lands for solid waste diversion and resource recovery within the Heavy Industrial Place Type or on lands with specific policies.</td></tr>
<tr><td>Provincial Government
A Strategy for Waste-Free Ontario – Building a Circular Economy
(February 2017)</td><td>Our strategy to achieve a circular economy
For Ontario to thrive, it must take advantage of resource recovery and waste reduction as economic drivers and factors in environmental protection. Building on our new foundation, the following outlines Ontario’s strategy to achieve its transformation to a circular economy.
Vision
The vision for Ontario is one where waste is seen as a resource that can be recovered, reused and reintegrated to achieve a circular economy.
Goals
The goals are to achieve a zero waste Ontario and zero greenhouse gas emissions from the waste sector.
Zero waste Ontario is a visionary goal that provides the guiding principles needed to work toward the elimination of waste. It is a new approach that focuses on preventing waste in the first place rather than relying on traditional end-of-life waste management solutions.
The visionary goal of eliminating greenhouse gases from the waste sector will guide our priorities for resource recovery and waste reduction. It will help the province meet its climate change commitments and build a low-carbon economy while protecting Ontario’s natural environment.
Interim Diversion Goals [for combined residential, business and institutional waste streams]
• sets a vision and goals including interim waste diversion goals for 2020 (30%), 2030 (50%) and 2050 (80%);
Municipalities will need to deliver at least 60% waste diversion.</td></tr>
<tr><td>Provincial Government
Food and Organic Waste Framework
(April 2018)</td><td>Targets - Sector-specific waste reduction and resource recovery targets are included in the table below. The persons or entities set out in column 1 must meet the targets in column 2 by the dates set out in column 2.
<table><tr><th>Person or entity</th><th>Target</th></tr><tr><td>b) Municipalities in Southern Ontario subject to policy 4.2i</td><td>70% waste reduction and resource recovery of food and organic waste generated by single-family dwellings by 2025</td></tr><tr><td>e) Multi-unit residential buildings subject to policy 4.10</td><td>50% waste reduction and resource recovery of food and organic waste generated at the building by 2025</td></tr><tr><td>f) Industrial and commercial facilities subject to policy 4.14</td><td>70% waste reduction and resource recovery of food and organic waste generated in the facility by 2025</td></tr><tr><td>h) Educational institutions and hospitals subject to policy 4.18</td><td>70% waste reduction and resource recovery of food and organic waste generated in the facility by 2025</td></tr></table>Province to ban food and organic waste from ending up in disposal sites (starting in 2022) - The province will develop, consult on, and implement a food and organic waste disposal ban regulation under the Environmental Protection Act.</td></tr>
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APPENDIX B
Ipsos Public Affairs - Summary - City of London Waste Diversion Survey

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.

Key Findings

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 food waste avoidance 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.

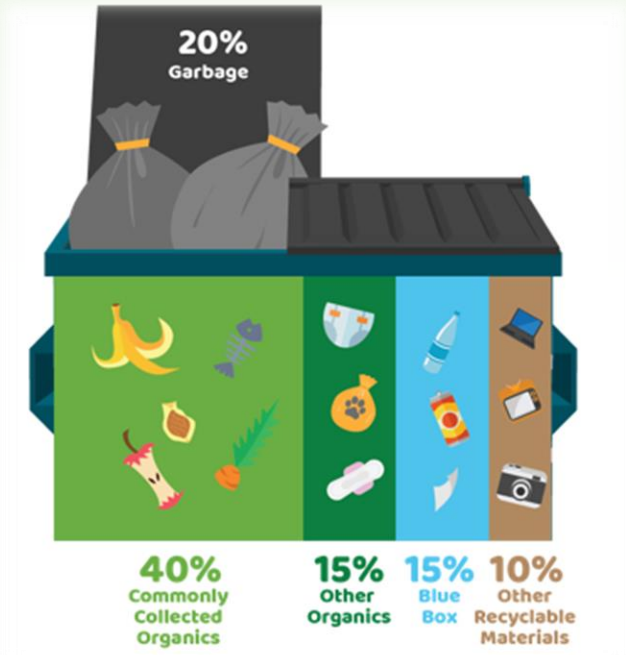
    - When residents were informed that items such as electronics, scrap metal, Christmas trees and tires are no longer picked up curbside and have to be dropped off at a depot, two-thirds (65%) indicate that they are prepared to deliver more materials to drop-off depots.

    - 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.

60% Waste Diversion Action Plan

What's in the garbage?

Single Family Homes



Apartments

Waste Management Working Group:	**July 13, 2018**
Civic Works Committee:	**July 17, 2018**
Municipal Council:	**July 24, 2018**
Community Engagement:	**July 25 – September 27, 2018**

Why Waste?

getinvolved.london.ca

London
CANADA

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EXECUTIVE SUMMARY

Background

In London more than one tonne of waste is produced annually per person. This includes waste generated at home as well as waste generated by businesses. About a third of this waste is diverted through numerous waste reduction, reuse, recycling and composting programs. The overall waste diversion rate for London is between 30% and 35%. The residential (household) diversion rate is 45%.

To plan for the future, the City is developing a long term Resource Recovery Strategy. The Strategy involves the development of a plan to maximize waste reduction, reuse, recycling and resource recovery in an economical viable and environmentally responsible manner. The Resource Recovery Strategy includes a commitment by City council to increase the household waste diversion rate from 45% to 60% by the end of 2022. This report, 60% Waste Diversion Action Plan, details the actions required to meet this commitment. Work on the broader Resource Recovery Strategy continues with a focus on how to go beyond 60% diversion. Both projects also address the Strategic Plan for the City of London (2015-2019) and The London Plan (2016-2035).

Development of the Action Plan draws on a variety of sources of information, experience and insight from other waste management and environmental professionals. This included a review of other Ontario and other municipalities in Canada and the United States; consideration of regional resource recovery opportunities; engagement and feedback from the public; consideration and alignment with provincial strategies, direction and legislation; updating local waste composition data for curbside and multi-residential homes; and gathering information from the waste management and resource recovery industry.

Waste Composition

Single families make up about 70% of London's households and generate about 61,000 tonnes of the residential garbage each year that is collected and landfilled. A large percentage of this waste could be composted or recycled. About 7% is material that should have been placed in the Blue Box. A further 13% of the garbage, including textiles, scrap metal, electronics, renovation materials and plastic bags, which could have been dropped off at a depot, taken to a store for recycling or are materials that have been identified in the province’s Strategy for a Waste-Free Ontario for future diversion programs.

About 60% of landfill garbage is primarily organic matter and is compostable/digestible. The organics are made up of food scraps (36% of all waste), non-recyclable paper like paper towel & paper napkins, yard waste, pet waste and sanitary products (e.g., diapers). About 30% of London's households live in multi-residential (apartment/ condominium) buildings and generate approximately 23,000 tonnes of garbage per year. The garbage composition from multi-residential buildings is similar to the garbage from single family households with some key differences (e.g., more recyclables, less food and organic waste).

Action Plan

This report proposes the following set of actions to achieve this goal (Table ES-1):

Table ES-1 Proposed Actions to Achieve 60% Residential Waste Diversion

Blue Box (Blue Cart) Programs
1. Increase capture of recyclables from 63% to 75% (less placed in the garbage)
New (or Expanded) Recycling Programs and Initiatives
2. Bulky Plastics a) Continue with existing pilot project b) Consider implementation of an expanded program once long term stable markets have developed 3. Carpets a) Wait to see if the Province develops a provincial program for carpets under the *Waste-Free Ontario Act* as there are limited markets for recycling carpets in the province b) If no provincial program exists by 2021, implement a pilot project 4. Ceramics a) Provide a drop-off location for ceramics at no cost at the City's EnviroDepots b) Ban toilets from curbside garbage collection 5. Clothing and Textiles a) develop a textile awareness strategy to promote existing reuse opportunities b) pilot depot collection at select multi-residential buildings 6. Small Metal (Small Appliances/Electrical Tools/Scrap Metal) a) implement semi-annual curbside collection of small metal items b) pilot depot collection at select multi-residential buildings 7. Furniture a) Begin semi-annual collection of wooden furniture b) Provide a drop-off location at W12A EnviroDepot for wooden furniture c) Ban wooden furniture from curbside garbage collection 8. Mattresses a) Wait to see if the Province develops a provincial program for mattresses under the *Waste-Free Ontario Act* as there are limited markets for recycling mattresses in the province b) If no provincial program exists by 2021, implement a pilot project
Curbside Organics Management Program
9. Implement a curbside Green Bin program 10. Implement bi-weekly garbage collection
Multi-Residential Organics Management Program
11. Implement a mixed waste processing pilot (to recover organics and other materials) on a portion of the waste from multi-residential homes

Table continues

Table ES-1 Proposed Actions to Achieve 60% Residential Waste Diversion

Other New Organics Management Programs
12. Develop and implement a food waste avoidance strategy 13. Reduce the cost of composters at the EnviroDepots and undertake additional sale events at select community locations 14. Provide financial support to community groups or environmental organizations that want to set up a community composting program
Waste Reduction and Reuse Initiatives and Policies
15. Create a Waste Reduction and Reuse Coordinator position within the Solid Waste Management Division 16. Provide financial support for community waste reduction and reuse initiatives 17. Reduce the container limit to two or three containers per collection when the Green Bin program with bi-weekly garbage collection is operational 18. Further explore the use of clear bags for garbage collection if London does not move to a roll-out cart based garbage collection system 19. Further explore a full user pay garbage system if London moves to a roll-out cart based garbage collection system 20. Further examine other incentive and disincentive initiatives (best practices) from other municipalities (e.g., mandatory recycling by-law, reward systems, user fees, etc.) 21. Provide additional feedback approaches to residents (including how waste reduction and waste diversion are calculated when providing waste management progress reports)

Benefits and Costs

By taking the steps outlined in this Action Plan, a number of environmental, social and financial benefits will be achieved. These include increased waste diversion (33% more diversion); creation of jobs (between 125 and 170 direct and indirect; within and outside London); reduced greenhouse gas emissions (equivalent of removing 4,200 to 6,800 cars from the road); reduced landfill impacts; better use of material and resources; residents will feel satisfaction or pride of living in an environmentally progressive community; and short-term landfill cost savings.

It is expected that approval of any expansion of the landfill by the Ministry of Environment, Conservation and Parks (MOECP) would be unlikely unless the City has programs in place to achieve 60% waste diversion. The increase in waste disposal costs will be significant if the City must export its waste to a private landfill elsewhere in Ontario. The increase in disposal costs for the City to export its waste is estimated to be approximately $5 to $7 million per year.

The approximate cost, expected diversion and timeline for implementation for the actions listed above are summarized in Table ES-2.

Table ES-2 - Summary of Diversion, Estimated Operating Costs and Schedule

Program Category	Diversion Rate		Annual Estimated Operating Cost			Schedule
	Range	Likely	Range	Likely	$/Hhld[a]	
Blue Box Recycling Improvements	1% - 3%	2%	$0	$0	$0	Likely not under City control[b] in the future
New Recycling Programs and Initiatives	0.4% - 0.8%	0.6%	$350,000 - $550,000	$450,000	$2.00 - $3.00	2019[c] - 2021
Curbside Organics Management Program	8% - 12%	10%	$3,900,000 - $5,500,000	$5,000,000	$21.75 - $30.50	2020 - 2022
Multi-Residential Organics Management Pilot Program	0.5% - 0.7%	0.6%	$400,000 - $700,000	$500,000	$2.25 – 4.00	2020
Other Organic Management Programs	0.3%- 0.6%	0.4%	$250,000 - $350,000	$300,000	$1.50 – $2.00	2019[c] - 2021
Waste Reduction, Reuse Initiatives and Policies	1% - 4%	1.4%	$150,000 - $350,000	$250,000	$0.50 - $2.00	2019[c] - 2021
Total[d]	**11% - 21%**	**15%**	**$5,050,000 - $7,450,000**	**$6,500,000 ($36.00)**	**$28.00 - $41.50**	**2019[c] - 2022**

Notes:

a) Based on 180,000 households.

b) The provincial Waste-Free Ontario Strategy calls for a transition from the current Blue Box program, which is municipally managed and co-funded by industry and municipalities, toward a full extended producer responsibility (EPR) and/or individual responsibility (IPR) program by 2023. The EPR program will require producers to take full financial and operational responsibility for all Ontario municipal Blue Box programs.

c) 2019 Multi-year budget has $140,000 assigned to new waste diversion initiatives.

d) Totals may not add due to rounding.

Financial Considerations – Funding 60% Waste Diversion

Potential funding sources to lower the annual cost of $5.05 - $7.45 million by $1.8 to $3 million per year are highlighted below.

Operating Costs

As shown in Table ES-2, annual operating costs for the 60% Waste Diversion Action Plan will range from $5.05 million to $7.45 million and will depend on final program design, market competition, etc. The most likely annual operating cost is estimated to be $6.5 million.

City staff continue to examine a number of financing approaches. The change in government in Ontario has created additional uncertainty as a number of potential revenue sources for waste diversion are on hold. Besides taxes, potential sources of revenue currently include:

- Additional recycling program costs paid by industry - potential cost savings from expected transition from the current Blue Box program, which is municipally managed and co-funded by industry and municipalities, toward a full EPR program paid 100% by industry by 2023. This is expected to reduce the City's current waste diversion program costs by $1.5 to $1.8 million. In addition there is the potential of one time capital funding for recycling infrastructure. It is not clear when full funding would be paid to the City.

- Other extended producer responsibility revenues - for items such as branded organics (e.g., diapers, soiled paper, tissues/toweling) carpets, textiles, furniture and other consumer goods. These sources could range between $50,000 and $150,000 per year.

- W12A Landfill levy to support diversion - a specific amount charged per tonne of garbage disposed of at the landfill that is placed in a dedicated fund for waste reduction and diversion. The amount that could be collected is based on many factors (e.g., which garbage is it applied to, what fee, etc.). Levies between $2 and $20 per tonne are in place in some jurisdictions. Revenue from this source could range between $250,000 and $1 million per year.

- Greenhouse gas offset credits associated with organics diversion – the Government of Ontario was working on introducing an emissions offset protocol for aerobic composting into Ontario's Cap & Trade program, based on an existing protocol used in Alberta (e.g., five composting projects currently listed on the Alberta Emissions Offset Registry). The value of these offsets would have been between $100,000 and $500,000 per year based on an assumed value of around $20 per tonne of GHG emissions offset (and increasing over time). It is unclear at this time how/if this funding opportunity will be replaced by the current provincial government.

A summary of estimated operating costs and potential annual funding is identified on Table ES-3.

Table ES-3 – Summary of Estimated Costs and Potential Funding

	Low	High	Likely (Anticipated)
Costs (Table ES-2)	$5,050,000	$7,450,000	$6,500,000
Revenues	$1,800,000	$2,950,000	$2,000,000
Total Estimated Costs			$4,500,000

Capital

Capital costs for the 60% Waste Diversion Action Plan will depend on program design, technology considerations, etc. The largest capital expenditure will be for the Green Bin Program. A capital cost of $12 million for the Green Bin program had previously been estimated (January 2016, Multi-year Budget deliberations). Other waste diversion initiatives listed in the Action Plan may require new investment in the order of $500,000 to $3 million for a total of $12.5 to $15 million in capital expenditures.

It is expected that capital costs for the 60% Waste Diversion Action Plan will be able to be funded from the existing capital budget. The current ten-year capital program includes $35 million in 2020 for new solid waste diversion technologies to increase diversion. After allocating up to $15 million for the Action Plan, there would be $20 million left for advanced waste diversion and/or resource recovery technologies.

Additional Community Engagement

The community engagement proposed for the 60% Waste Diversion Action Plan is presented in Table ES-4.

Table ES-4 – Community Engagement for 60% Waste Diversion Action Plan

Date	Event	Comments
July 17, 2018	CWC Meeting	• Approve in Principle Draft Action Plan to achieve 60% waste diversion by 2022 • Approve to circulate and receive feedback on the 60% Waste Diversion Action Plan
July 24	Council	
July 25 to September 10	Provide feedback opportunities on WhyWaste Resource Recovery Strategy website	• Advertise in the London Free Press, The Londoner and on social media
	Circulate to Community Stakeholder Groups	• Circulate and ask for feedback from Waste Management Community Liaison, Committee (WMCLC), W12A Landfill Public Liaison Committee, Urban League and Advisory Committee on the Environment (ACE)

Table ES-4 – Community Engagement for 60% Waste Diversion Action Plan

Date	Event	Comments
	Circulate to Waste Management/ Recycling Companies	• Circulate and ask for feedback from local companies including Emterra, Green Valley Recycling, Miller Waste, Orgaworld, StormFisher, Try Recycling, Waste Connections and Waste Management
	Community Festival	• Attend Gathering on the Green II, Sunday August 19, 2018
	Presentations	• Present to WMCLC in early August (TBD) • Present to ACE on September 5, 2018
September 27	Public Participation Meeting	• CWC receives comments from the public and other stakeholders
January/ February 2019	CWC Meeting	• Approval of 60% Waste Diversion Action Plan • Implementation details and final cost estimates to be provided at this time

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1) INTRODUCTION

1.1 BACKGROUND

General

In London more than one tonne of waste is produced annually per person. This includes waste generated at home as well as waste generated by businesses. About a third of this waste is diverted through numerous waste reduction, reuse, recycling and composting programs. The overall waste diversion rate for London is between 30% and 35%. The residential (household) diversion rate is 45%.

To plan for the future, the City is developing a long term Resource Recovery Strategy. The Resource Recovery Strategy involves the development of a plan to maximize waste reduction, reuse, recycling and resource recovery in an economically viable and environmentally responsible manner.

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 the end of 2022 from the current rate of 45%;
- opportunities for advanced resource recovery and increased waste diversion through new, emerging and next generation technologies and where these technologies may play a role in London and area;
- areas to reduce or maintain current costs of City programs;
- ways in which to support local job creation efforts;
- ways in which to maximize program convenience to Londoners; and,
- methods to align with Provincial direction and the *Waste Free Ontario Act, 2016.*

This report addresses the portion of the Resource Recovery Strategy dealing with increasing London's household waste diversion rate to 60% by the end of 2022.

60% Waste Diversion Goal for Household Waste

- Was approved by City Council in the Fall 2017
- Consistent with Waste-Free Ontario Strategy
- Considered practical limit for a large Ontario municipality
- Average diversion rate for large municipalities in Ontario with a Green Bin was 53% in 2016 (Resource Productivity & Recovery Authority)
- Three municipalities have a diversion rate of about 60% (Simcoe County, Dufferin County, City of Kingston) and only the Region of York (including Markham at 71%) has exceeded 60%

Increasing waste diversion is consistent with the *Strategic Plan for the City of London (2015 - 2019)* goals of "Building a Sustainable City" and Growing our Economy and *The London Plan (December 28, 2016)* direction to "Become one of the greenest cities in Canada" which includes "Minimize waste generation, maximize resource recovery, and responsibly dispose of residual waste".

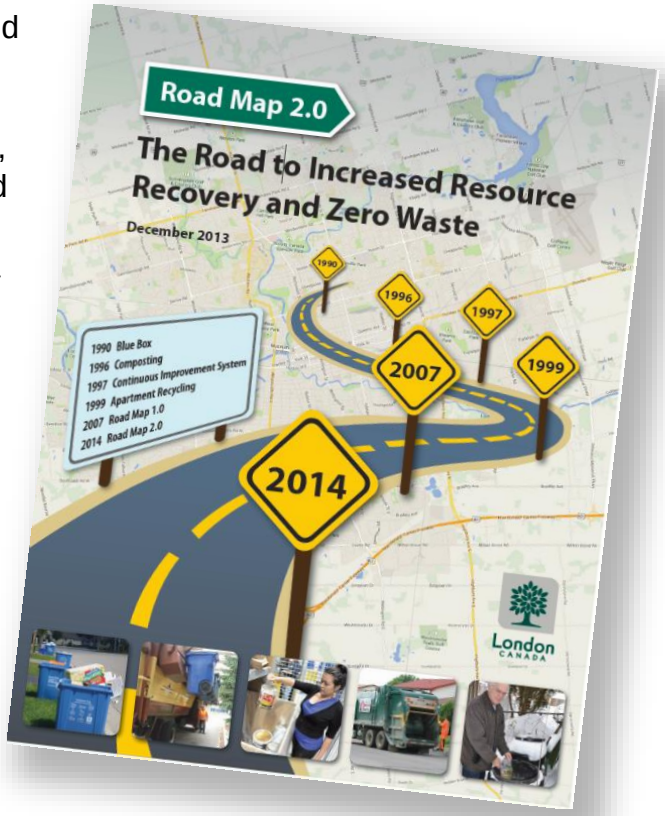
Previous Planning Exercises

Since the mid-1990s, the City's Waste Management System has been based on a Continuous Improvement Strategy (management philosophy) and Sustainable Waste Management. This strategy, which was approved by Municipal Council in 1997, has been the foundation for going forward. It uses an active framework that recognizes integrated waste management as an important environmental service in the community. By effectively allocating financial and human resources, this environmental service contributes to the protection of human health and the environment. By supporting an integrated system of waste reduction (i.e., not producing waste in the first place), recovery of materials that can be recycled and composted, and ensuring that what remains is handled in an environmentally responsible manner, this strategy provides the mechanism for continuous improvement of the waste management system. Since this strategy was approved over twenty years ago, London has steadily increased its performance to the current level of 45% waste diversion while having one of the lowest total waste management costs in Ontario for urban centres (based on statistics compiled by the Municipal Benchmarking Network Canada).

The 60% Waste Diversion Action Plan builds on previous waste diversion planning documents; *A Road Map to Maximize Waste Diversion in London* (2007) and *Road Map 2.0 The Road to Increased Resource Recovery and Zero Waste* (2013).

A Road Map to Maximize Waste Diversion in London (2007) outlined a number of options to achieve higher diversion rates and asked for feedback from the public. Diversion measures implemented as a result of this process included new materials added to the Blue Box program (e.g., milk and juice cartons, drinking boxes, mixed plastics, steel paint cans, aerosol cans and cardboard cans), new materials

added to the EnviroDepots (e.g., tires, appliances, fluorescent tubes and bulbs), second Blue Box provided to single family homes, reusable blue bags provided to apartment units, more blue carts supplied to apartment buildings, expansion of the Oxford EnviroDepot, increased days open at the Household Special Waste depot from one to five days and completion of a Green Bin pilot study.



Road Map 2.0 The Road to Increased Resource Recovery and Zero Waste (2013) also outlined a number of options to achieve higher diversion rates and asked for feedback from the public. Diversion measures implemented as a result of this process included the reduction in the garbage container limit from 4 to 3 containers per collection, construction of a fourth EnviroDepot to serve the north end of the city, new materials added to the Blue Box program (mixed polycoat), completed community composting pilot projects, completed food reduction awareness pilot projects and instituted the curbside collection and composting of Christmas trees.

Current Diversion

Since 1990 with the introduction of the curbside Blue Box program, the City has continuously implemented new programs and initiatives and improved existing programs to help residents divert waste away from disposal. Key changes are listed in Table 1 and their effect on waste diversion is shown in Figure 1.

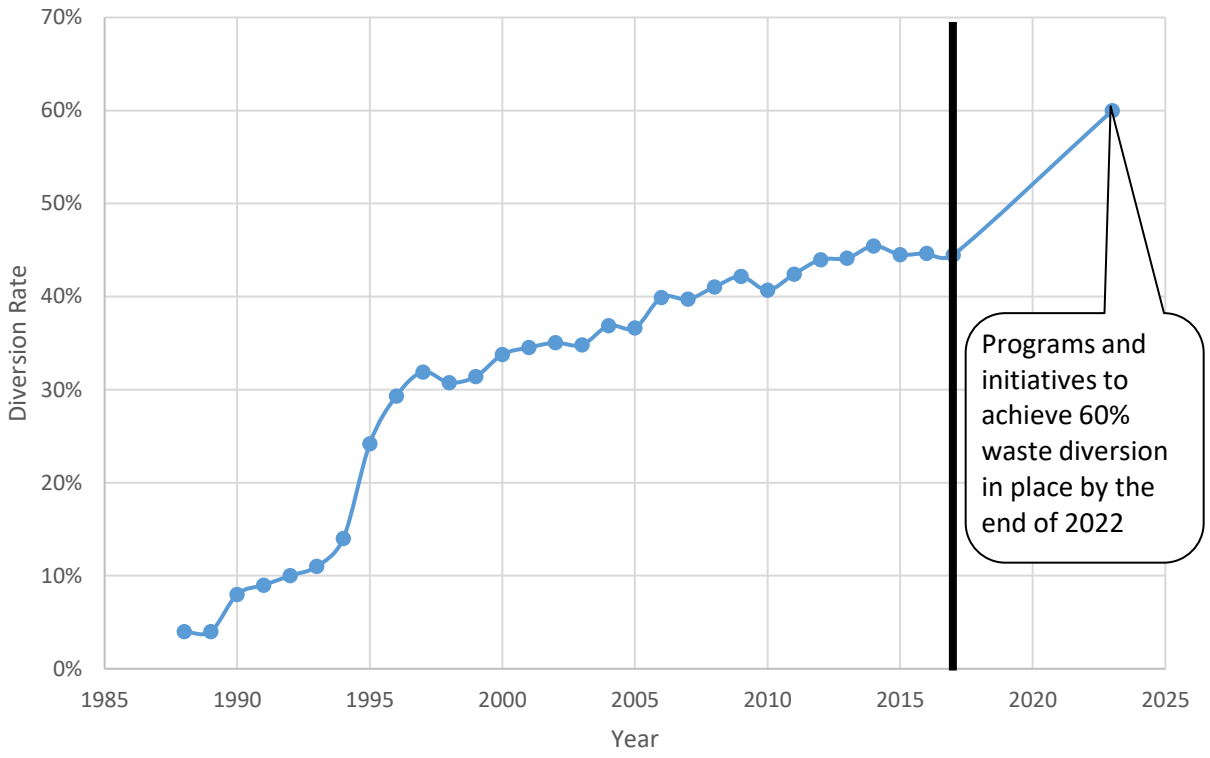
As shown in Figure 1, London's average household diversion rate was 45% in 2017. This was achieved by diverting approximately 72,000 tonnes of materials through various existing recycling, reuse, reduction and composting programs. Approximately 67,000 tonnes were diverted from single family (curbside) homes for a waste diversion rate of 50% while approximately 5,000 tonnes were diverted from multi-residential (apartment) homes for a waste diversion rate of 20%.

In 2017, 23,000 tonnes (15% of all waste) of Blue Box recyclables, 36,000 tonnes (22% of all waste) of yard waste organics and 13,000 (8% of all waste) from other diversion programs (e.g., electronics recycling, tire recycling, etc.) were diverted from disposal. A detailed breakdown of the amount diverted and a description of these programs is presented in Appendix A.

Table 1 - Key Waste Diversion Programs and Initiatives

Year	Program/Initiatives
1990	• Curbside Blue Box pickup introduced city-wide
1994	• Appliances banned from garbage collection
1995	• Added new items to Blue Box • Grass clippings banned from garbage collection
1996	• Curbside pickup of yard materials (waste)
2000	• Multi-Residential Building Recycling Program started
2002	• Electronics Recycling introduced at the EnviroDepots
2003	• Public Space Recycling started
2005	• Renovation Material accepted for recycling at the EnviroDepots
2006	• 4 Container Limit for Garbage introduced for curbside collection
2009	• Added more items to Blue Box Program • Tires, propane tanks and batteries accepted for recycling at the EnviroDepots
2010	• Fluorescent tubes and bulbs accepted for recycling at the EnviroDepots
2011	• Added more items to Blue Box Program • Provided residents with a second larger Blue Box • Completed construction and started operations of London Regional Materials Recovery Facility (MRF), increasing scale, efficiency and recovery of collected Blue Box Materials • Started signing agreements with a number of neighbouring municipalities to send recyclables to the MRF
2014	• Added more items to the Blue Box Program
2016	• 3 Container Limit for Garbage introduced for curbside collection
2017	• Curbside Christmas Tree collection for composting started

Figure 1- Diversion Rate



1.2 COUNCIL DIRECTION

The Resource Recovery Strategy includes a commitment by City council to increase the residential waste diversion rate to 60% by 2022. This commitment was made at the October 30, 2017 City Council meeting by passing the following resolution:

> *"The W12A Landfill expansion be sized assuming the residential waste diversion rate is 60% by 2022 noting this does not prevent increasing London's residential waste diversion rate above 60% between 2022 and 2050."*

Other key documents that highlight waste diversion and resource recovery and provide further context for the 60% Waste Diversion Action Plan include:

- Strategic Plan for the City of London (2015-2019) – next page
- The London Plan (December 28, 2016) – next page

The 60% waste diversion goal will be included in the environmental assessment as part of the commitments made by the City. It will be a key consideration in the Ministry of the Environment, Conservation and Parks (MOECP formerly called the Ministry of the Environment and Climate Change - MOECC) approval of the environmental assessment for expansion of the W12A Landfill.

City Council – Strategic Plan (2015-2019) and The London Plan

[Extracts from]

Strategic Plan for the City of London (2015-2019)

Building a Sustainable City

1. Robust Infrastructure

What are we doing?

Increase efforts on more resource recovery, long-term disposal capacity, and reducing community impacts of waste management.

How are we doing it?

Long-Term Waste Management Plan

Growing our Economy

3. Local, regional, and global innovation

What are we doing?

Lead the development of new ways to resource recovery, energy recovery, and utility and resource optimization with our local and regional partners to keep our operating costs low and assist businesses with commercialization to help grow London's economy.

How are we doing it?

London Waste to Resources Innovation Centre

[Extracts from]

The London Plan

London 2035: Exciting Exceptional, Connected

Key Directions

Direction #4 *Become one of the greenest cities in Canada*

#12 Minimize waste generation, maximize resource recovery, and responsibly dispose of residual waste.

Solid Waste Management

479_ The following policies are separated into two primary areas: Diversion and Disposal.

>>DIVERSION - REDUCING, REUSING, RECYCLING, COMPOSTING AND RECOVERY

480_ The City will promote the reduction, re-use, recycling, composting, and recovery of materials from solid waste, wherever possible, through the use of innovative means, new technology, conservation measures, and public education and community engagement programs.

continued

City Council – Strategic Plan (2015-2019) and The London Plan

481_ The City will support the reduction, re-use, recycling, composting and recovery of materials by:

1. *Initiating, participating and collaborating in public education, awareness, and community engagement programs with residents, Londoners, businesses and other agencies and organizations.*
2. *Collaborating with other municipalities to develop long-term strategies to reduce, reuse, recycle, and recover materials from the waste stream.*
3. *Encouraging development proposals to provide adequate recycling and composting facilities, and support innovative waste collection and diversion programs.*
4. *Increasing waste diversion through existing technologies and new, emerging and next-generation technologies as they become available, practical, and financially feasible for London.*
5. *Exploring energy from waste opportunities.*

482_ In addition to municipal waste management facilities within the Waste Management Resource Recovery Area Place Type, City Council will support the adequate provision of lands for solid waste diversion and resource recovery within the Heavy Industrial Place Type or on lands with specific policies.

1.3 PROVINCIAL DIRECTION

Waste-Free Ontario Strategy

The Province approved a road map for resource recovery and waste reduction known as the *Strategy for a Waste-Free Ontario: Building the Circular Economy* in February 2017. The Strategy:

- has a long term goal of zero waste and zero greenhouse gas emissions from the waste sector,
- sets interim waste diversion goals for 2020 (30%), 2030 (50%) and 2050 (80%) for combined waste streams; and,
- lists a number of objectives and actions to achieve long term and interim goals.

One of the key proposed actions was to make companies that produce or import products responsible for managing their end-of-life requirements. This is called full Extended Producer Responsibility (EPR). Initially EPR will be applied to products and packages that have existing mandated recycling programs such as tires, municipal hazardous and

special waste, electronics and Blue Box materials. Other materials such as carpets, mattresses and furniture will be considered in the future. A second key proposed action was the development of a *Food and Organic Waste Action Plan* by the Province which will contain actions directed at reducing and diverting food and organic waste away from disposal facilities. The complete Waste-Free Ontario Strategy can be found at: www.ontario.ca/page/strategy-waste-free-ontario-building-circular-economy.

Full EPR and the Blue Box Program

The Waste-Free Ontario Strategy calls for a transition from the current Blue Box program, which is municipally managed and co-funded by industry and municipalities, toward a full EPR program by 2023. The EPR program will require producers to take full financial and operational responsibility for all Ontario municipal Blue Box programs.

Current Blue Box Funding

- ✓ Net cost of the Blue Box program split approximately 50/50 between municipalities and industry.
- ✓ In 2017 London received $3.1 million from industry funding to cover operating and long term capital costs of $6.2 million.

Industry and municipalities have been working on a transition plan (known as the amended Blue Box Program Plan) to gradually shift the full financial and operational responsibility of the Blue Box Program to industry. This transition plan, prepared by Stewardship Ontario (i.e., businesses responsible for items collected in the Blue Box) is expected to establish goals and targets aimed at improving environmental performance and program experience for Ontario residents by:

- Including new materials;
- Setting a general provincial capture rate of 75% of Blue Box materials (currently 63% of Blue Box materials are captured province wide);
- Looking at how to develop end-markets and collection systems for difficult to recycle materials (e.g., chip bags); and
- Standardizing the program across the province to attempt to achieve a consistent experience for all Ontario residents.

Details of the proposed plan can be found at rpra.ca/amended-blue-box-program. The transition plan is currently on hold until further details are provided by Stewardship Ontario, Resource Productivity & Recovery Authority (RPRA), and the Ministry of the Environment, Conservation and Parks (MOECP) (formerly the Ministry of the Environment and Climate Change).

Food and Organic Waste Action Plan

The Strategy for a Waste-Free Ontario called for implementation of an action plan to reduce the volume of food and organic wastes going to landfill. This resulted in development of the Food and Organic Waste Framework which was released on April 30, 2018. Highlights of the Framework include:

Food and Organics Waste Framework

The Framework consists of two complementary components:

- ✓ *Food and Organic Waste Action Plan*, which outlines strategic commitments to be taken by the province to address food and organic waste.
- ✓ *Food and Organic Waste Policy Statement,* which provides direction to the province, municipalities, producers, businesses and others to further the provincial interest in waste reduction and resource recovery as it relates to food and organic waste.

- Ontario Food Recovery Hierarchy that consists of the following steps in order of importance:
  1. Reduce: prevent or reduce food and organic waste at the source.
  2. Feed People: safely rescue and redirect surplus food before it becomes waste.
  3. Recover Resources: recover food and organic waste to develop end-products for a beneficial use.
- Organizations (entities) identified must meet the targets assigned to them.
- A 70% target for waste reduction and resource recovery of food and organic waste for municipalities (like London), educational institutions and hospitals by 2025.
- A 50% target for waste reduction and resource recovery of food and organic waste for multi-residential buildings by 2025.
- Larger retail shopping establishments, office buildings, restaurants, hotels and manufacturing establishments are responsible for having source separated food and organic waste programs by 2025.

The complete Food and Organic Waste Framework can be found at: www.ontario.ca/page/food-and-organic-waste-framework

1.4 GUIDING PRINCIPLES

Guiding principles have been developed by the City and approved by City Council to direct the development of the Resource Recovery Strategy and the 60% Waste Diversion Action Plan.

Over the last ten years, there have been numerous community engagement activities with respect to solid waste management in London including:

- 2006 to 2009 – W12A Landfill Area Plan and W12A Landfill Site Community Enhancement and Mitigative Measures Program
- 2007 – *A Road Map to Maximize Waste Diversion in London*
- 2013 – *Road Map 2.0: The Road to Increased Resource Recovery and Zero Waste (and the Interim Waste Diversion Plan 2014 – 2015)*
- 2014 – Public Feedback on Different Garbage and Recycling Collection Frequency Schedules
- 2015 to 2016 – Streamlined EA (Environmental Screening) for Waste Disposal regarding service area expansion
- 2016 – Garbage Container Limits

Based on these previous community engagement activities and ongoing input received from City Council, a number of Council Advisory Committees, community and business groups, and the W12A Landfill Public Liaison Committee (PLC), the eleven guiding principles (Table 2) were identified that reflect community values, concerns and priorities at this point in time.

Community and stakeholder input on the guiding principles was completed as part of the community engagement processes. Various community engagement tools (e.g., traditional media, social media, getinvolved.london.ca website, the City's website, open houses, etc.) were used and the final guiding principles were approved in October 2017.

All guiding principles received general support from the public with the following ones receiving the most support:

- Make waste reduction the first priority
- Be socially responsible
- Ensure financial sustainability

1.5 HOW THIS REPORT WAS PREPARED

The 60% Waste Diversion Action Plan outlines the steps that the City and residents of London will need to take in order to reach 60% waste diversion by the end of 2022. The Action Plan is part of a broader Resource Recovery Strategy. Both projects are being led by City staff with most reports prepared internally. Technical expertise has been obtained in areas where City staff have less familiarity and/or additional advice is key.

Both projects draw on a variety of sources of information, experience and insight from others in the activity areas listed below. It is important to note that many of these initiatives are ongoing as the fields of waste diversion, resource recovery and waste management continue to evolve.

Table 2 - Guiding Principles

Be Socially Responsible – Develop socially acceptable and fair solutions that minimize social impacts, encourage participating and maximize social benefits for residents and businesses and take into account input from residents and businesses.
Ensure Financial Sustainability – Develop financially sustainable solutions that are easy and affordable to maintain by current and future generations and also help to stimulate economic growth within the community.
Ensure Responsibility for Waste Management – Waste management is a fundamental service provided by municipal governments. London should manage residential waste and resources generated within its boundaries. London should ensure that local businesses have access to competitive resource recovery and residual waste disposal options.
Ensure Impacts of Residual Waste Disposal are Minimized – Waste disposal facilities must meet, and if possible, exceed all applicable regulatory standards. London will make all reasonable efforts to reduce and address negative effects of any future residual waste disposal facility through proper design and operation of the facility, as well as providing appropriate mitigation measures to the surrounding community.
Implement more Resource Recovery Solutions – Residual waste needs to be minimized and any waste that is generated needs to be treated as a resource, when practical. Resource recovery includes reuse, recycling, composting, anaerobic digestion and waste conversion to create energy and energy products. Resource recovery will balance environmental, social and financial needs along the road to a waste-free Ontario in the future.
Make the Future System Transparent – Future decisions on the implementation of the Resource Recovery Strategy and Residual Waste Disposal Strategy will continue to be open, accessible, based on best practices and facts, and follow the Corporation of the City of London by-laws, policies and practices to find solutions.
Make Waste Reduction the First Priority – The City's first goal is to reduce the amount of material being generated by residents and businesses that requires management (e.g., encourage food waste avoidance, composting at home, local policies to encourage waste reduction, supporting producer responsibility and other provincial and federal programs).
Prioritize the Community's Health and Environment – The health of London's residents and the environment is a priority in decision-making to minimize negative impacts and to maximize the benefits.
Support Development of Business (contractual) Partnerships – Working together with the private sector will ensure that roles, responsibilities and skills are assigned appropriately such that municipal resources are maximized and the best opportunities for London and potential partners are created.
Support Development of Community Partnerships – Working together with local community groups and organizations will help London reach its waste diversion goals and maximize resource recovery more effectively and efficiently.
Work to Mitigate Climate Change Impacts – To reduce the impact on climate change London will identify, assess and implement solutions that reduce GHG emissions associated with its waste management system.

1. Preliminary Review of Potential Programs, Initiatives and Technologies

Preliminary review of potential programs, initiatives and technologies to develop a long list of waste diversion programs, initiatives and technologies that required further investigation. The Internet contains numerous municipal-led and/or consultant-led waste diversion strategies including background research.

2. (Ongoing) Review of Other Ontario Municipalities

A comprehensive review of waste diversion programs/initiatives in other large Ontario municipalities, other cities in Canada and a few cities in the United States was undertaken. City staff have many direct municipal contacts in Ontario municipalities and other cities in Canada that help to obtain important details. Staff are actively involved in the following associations:

- Regional Public Works Commissioners of Ontario (RPWCO)
- Municipal Resource Recovery & Research Collaborative (M3RC) including representatives from Association of Municipalities of Ontario (AMO), Municipal Waste Association (MWA), City of Toronto and RPWCO
- Ontario Waste Management Association (OWMA)
- Canadian Biogas Association (CBA)

3. (Ongoing) Consideration of Regional Resource Recovery Opportunities

In 2017, the City canvassed nearby municipalities (Elgin County, Huron County, Lambton County, Middlesex County, Oxford County and Perth County) responsible for waste management to determine their interest in using any future resource recovery facility(ies). All municipalities expressed an interest in being included in discussions about any new resource recovery facilities and indicated they would consider using the facility depending on the cost. The potential for a regional facility may make it possible to consider technologies that require larger waste quantities in order to be economically feasible.

4. (Ongoing) Community Feedback

Residents had a number of opportunities to provide feedback on what should be included in the Action Plan (Chapter 2.0). Information and feedback has also been sought from various City advisory committees and the Waste Management Community Liaison Committee.

5. (Ongoing) Alignment with Provincial Strategies and Legislation

Development of the Action Plan aligns with the provincial *Strategy for a Waste-Free Ontario: Building the Circular Economy* as well as new provincial waste management planning initiatives including the *Proposed Food and Organic Waste Framework* and the *Amended Blue Box Program Plan.*

6. Comparative Analysis

A comparative analysis of the potential programs/initiatives was completed looking at environmental (diversion rate, greenhouse gas reduction benefits); social (public support, resident benefits/issues); financial (costs, revenue) and technical (collection/processing issues, stability of end markets, proven technology) considerations.

7. (Ongoing) Consideration of Learnings from the Mixed Waste Processing Working Group

Formed in early 2017, the Region of Peel is the coordinator of a Mixed Waste Processing Working Group comprised of eight Ontario municipalities representing about half of Ontario's population. The Working Group shares updates, research results, Committee/Council reports, site visit experience and related operational experiences. Members (and estimated 2017 population) currently include:

City of London (380,000)	Region of Peel (1,400,000)	Region of Waterloo (538,000)
Region of Niagara (450,000)	County Simcoe (306,000)	Region of York (1,112,000)
County of Oxford (111,000)	City of Toronto (2,800,000)	

8. (Ongoing) Consideration of learnings from London Waste to Resources Innovation Centre

Input and advice acquired through the working relationships established as part of the Innovation Centre. The primary goals of the Innovation Centre are to:

- build on the existing foundation of traditional and innovative projects to divert waste from landfill and create value added products from residues and waste;

- create a focal point (location or locations) for the ongoing examination of innovative solutions for waste reduction, resource recovery, energy recovery and/or waste conversion into value-added materials, chemicals, heat and power;

- establish partnerships and collaborations between government, academia and businesses to synergistically build on existing strengths to create opportunities to prevent waste, to create products of value from waste, and to solve existing waste management challenges; and

- be known as an innovative centre of excellence with shared facilities and resources providing leadership, implementing best practices, undertaking leading edge research, providing knowledge and support to industry, while educating and training students, researchers and postdoctoral fellows in the various fields of resource and waste management.

Key research work that has been undertake includes:

- Food waste avoidance research with Western University, PhD Candidate Paul van der Werf and 2cg Consulting;
- Anaerobic digestion of source separated organics (SSO) and facility separated organics (FSO) to create renewable natural gas (RNG); and
- Literature review, analysis, and site visits for new, emerging and next generation technologies (e.g., gasification, pyrolysis, mixed waste processing)

9. (Ongoing) Peer Review

GHD, an engineering, architecture, environmental and construction services firm, and specializes in waste management technologies, has been retained to conduct a peer review of portions of the Action Plan dealing with any technical analysis and newer resource recovery technologies.

10. Request for Information

The City released a Request for Information (RFI) to obtain information about resource recovery (i.e., waste processing) technologies that might be suitable for the City of London to divert waste away from the City's Landfill. It is expected that the 60% diversion could be achieved by a combination of enhanced waste reduction initiatives, increased capture of Blue Box materials, the introduction of recycling of various bulky items and the introduction of an organics management program.

Data collected as part of this RFI will be used to assist City staff in determining if there are other options for reaching 60% diversion, how likely is it to increase diversion beyond 60% diversion in the near term, and how a transition program to advanced resource recovery can be designed now. Specifically the City is looking for technology providers for Mechanical Biological Treatment (MBT) or Waste Conversion systems. MBT systems refer to systems that separate mixed garbage in two or more waste streams for further processing. Further processing can include anaerobic or aerobic processing of an organics rich stream, capture of low quality recyclables, and production of a solid refuse fuel. Waste Conversion refers to technologies such as gasification, pyrolysis, etc. that typically produce a syngas, biochar and/or other products from garbage.

2) COMMUNITY ENGAGEMENT

2.1 OVERVIEW

Engagement and feedback from the public and other stakeholders is a key component in developing the 60% Waste Diversion Action Plan. It enabled stakeholders to participate in the planning of the programs and initiatives that will be part of the action plan and enhanced the quality of the plan.

2.2 ACTIVITIES AND FEEDBACK TO DRAFT 60% WASTE DIVERSION ACTION PLAN

The approaches used to engage the public and other stakeholders in development of the Action Plan included open houses, booths at community events, interactions with City of London Advisory Committees, the Resource Recovery Strategy website, creation of the Waste Management Community Liaison Committee and newspaper and social media advertisements. These events/initiatives are summarized in Table 3 with full details presented in Appendix B.

Table 3 - Community Engagement Activities

Event	Date/Location	Description/Comments
Open Houses		
Open House 1	May 24 (Horton Street Goodwill, 2 – 4 p.m, 5 – 8 p.m) May 25 (Lambeth Community Centre, 2 – 4 pm, 5 – 8 pm)	Background information provided on existing diversion programs, waste composition and potential new diversion programs. Feedback opportunities provided. City staff were available to answer questions.
Open House 2	November 29 (Horton Street Goodwill, 2 – 4 p.m, 5 – 8 p.m) November 30 (Lambeth Community Centre, 2 – 4 p.m, 5 – 8 p.m)	Updated information on changes to waste management and waste diversion from the Province, potential programs and initiatives to achieve 60% diversion and key technologies to achieve advanced diversion and resource recovery. Feedback opportunities provided. City staff was available to answer questions.

Table 3 - Community Engagement Activities

Event	Date/Location	Description/Comments
Community Events		
Gathering on the Green	June 3, 2017	Simple display promoting the getinvolved.london.ca website, Environmental Assessment (EA) process for expanding the W12A Landfill and waste composition. City staff was available to answer questions.
The Big Leak: Water Brothers	June 5, 2017	
Sesquifest	June 29 to July 2, 2017	
Sunfest	July 6 to July 9, 2017	
Home County Folk Festival	July 15 to July 16, 2017	
Inspiration Fest	July 23, 2017	
Forest Festival	August 19, 2017	
Gathering on the Green 2	August 20, 2017	
Neighbourhood Service Days	August 28 - September 1, 2017 Northwest London Resource Centre, Glen Cairn Community Centre	
London Home Show	January 26 - 28, 2018	Visitors requested to provide feedback on proposed waste diversion activities that could be implemented to achieve 60% waste diversion. A desk-side Blue Box was given to all participants.
City of London Advisory Committees		
Waste Management Community Liaison Committee (CLC)	June 5, 2017 to present	The Waste Management CLC was advised on Resource Recovery changes and initiatives as new information was available. Committee feedback was provided in support of the proposed initiatives.
Advisory Committee on the Environment (ACE)	May 3, 2017 and November 1, 2017	ACE was provided with updates as the project moves forward. Committee feedback was provided in support of the proposed initiatives.

Table 3 - Community Engagement Activities

Event	Date/Location	Description/Comments
Resource Recovery Strategy website		
	Live on April 25, 2017	Information about the Resource Recovery Strategy is available online on the getinvolved.london.ca website. Feedback can be provided. To date, over 3,000 visitors have accessed the website.

Through these community engagement activities, the City was soliciting feedback on specific topics and questions as well as asking for general comments and suggestions. Feedback on the specific topics and questions is presented in Tables 4 and 5. A summary of the popular comments and ideas are listed in Table 6.

Further details on the feedback for the specific topics and questions as well as all the general comments and suggestions provided are presented in Appendix C.

It is key to understand that this is a compilation of feedback. It is not a random sample of Londoners and has no statistical validity. Section 2.3 contains the results of a public opinion poll. However, it is very important to capture comments and feedback in an understandable format.

Table 4 - Feedback on First Round of Questions[1]

Question	Response	
Is new organic management program(s) the key to reaching 60% waste diversion by 2022?	Yes	86%
	Maybe	14%
	No	0%
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	57%
	Maybe	14%
	No	29%
Do you think that the Resource Recovery Strategy needs to be able to accommodate transition to new technology in the future, if appropriate?	Yes	100%

Notes 1: Questions posed at Open House and online. Seven total responses.

Table 5 - Feedback on Key Second Round of Questions[1]

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%	
How much more in municipal taxes and fees would you be prepared to pay per year for 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%	75% support for all proposed options
	Moderate Program: $0.75	38%	
	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%	

1. 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.

Table 6 - Popular Comments and Suggestions from the Community[1]

Comment/Suggestion	% of Responses	City Response
Pro green bin/source separated composting program; many comments asked for immediate implementation	39%	Yes, considered in the 60% Waste Diversion Action Plan.
Pro alternative resource recovery method (incineration, mixed waste processing, landfill mining)	6%	Options considered as part of the EA process for the expansion of W12A Landfill and will be discussed in the Resource Recovery Strategy.
Support bans on packaging/ manufacturers responsible	5%	In Ontario, this activity has generally occurred at the provincial government level.
Expand recycling program (Blue Box, public space, downtown)	4%	Being considered as part of extended producer responsibility (EPR) discussions.
Implement policies & by-laws (pay per bag, bag limit, clear bag)	4%	Yes, considered in the 60% Waste Diversion Action Plan.
Support home composting	4%	Yes, considered in the 60% Waste Diversion Action Plan.
London should stop taking Toronto's garbage	3%	London doesn't take Toronto's garbage.
Education on waste reduction/diversion is key	3%	Yes, considered in the 60% Waste Diversion Action Plan.
Opposed to green bins	2%	Provincial Statement requires London to implement organics management program.
Encourage reuse	2%	Yes, considered in the 60% Waste Diversion Action Plan.
Implement textile recycling	1%	Yes, considered in the 60% Waste Diversion Action Plan.

1. Written comments or suggestions provided to the City at an open house, on the getinvolved.london.ca website or on the City's Facebook page. The number of comments or suggestions were 233. Some respondents provided more than one comment.

2.3 PUBLIC OPINION SURVEY

To complement the community engagement discussed in Section 2.2, a survey of the opinions of London residents towards waste diversion was undertaken by Ipsos Public Affairs.

The survey was conducted online and the sample was drawn using Ipsos proprietary panel. To qualify for the survey, the respondent had to be a resident of the City of London and 18 years of age or older. The results of the survey are based on a total of n=301 online interviews completed between May 31 and June 4, 2018.

The precision of Ipsos online surveys is calculated via a credibility interval. According to Ipsos, the sample is considered accurate within +/- 6.4 percentage points, 19 times out of 20, had all London residents been surveyed.

Complete details of the survey are presented in Appendix D and summarized below. The survey included eight questions. Most of the questions were similar to questions asked of residents as part of the community engagement process. These questions, the results and how they compare to the feedback received during the community engagement process are presented in Table 7.

Table 7 - Results of Ipsos Public Affairs Survey

How important is waste diversion to you?		**Response**	**Comment**
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?	Very important	53%	Over 90% of residents think waste diversion is important.
	Somewhat important	40%	
	Not very important	5%	
	Not important at all	0%	
	Don't know	2%	
What Level of Investment Are You Willing to Make?		**Response**	**Comment**
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?	$0	24%	Over 75% of the respondents indicated they are prepared to pay more for waste diversion.
	$1 - $25	47%	
	$26 - $50	18%	
	$51 - $75	4%	
	$76 - $100	7%	

Table 7 - Results of Ipsos Public Affairs Survey

Potential New Programs and Initiatives (including the approximate annual cost per household)			Level of Support	Comment
Food Waste Avoidance	No change: $0		12%	Almost 90% of the respondents are interested in seeing some kind of program implemented.
	Moderate Program: $1		41%	
	Significant Program: $7		57%	
City Wide Organics – Curbside Program	No Change: $0		24%	3 of every 4 respondents want a new program. Green Bin has marginally more support than mixed waste program.
	Green Bin Program: $20		42%	
	Mixed Waste Program: $40		32%	
City Wide Organics – Multi-Residential Program	No Change: $0		19%	4 of every 5 respondents want a new program. Equal support for Green Bin (essentially on-site source separated organics) and Mixed Waste.
	Green Bin Program: $7		40%	
	Mixed Waste Program: $14		41%	
Are you prepared to deliver more materials (e.g., old furniture, carpet, small appliances, mattresses, etc.) to drop off-depots?		Yes	65%	2 of every 3 respondents are willing to deliver more materials to the EnviroDepots.
		No	35%	
Would you support banning additional materials from garbage pickup (e.g., old furniture, carpet, small appliances, mattresses, et.) if you could drop them off at a depot for recycling?		Yes	60%	3 of every 5 respondents support banning materials that have a recycling option.
		No	40%	

2.4 COMMUNITY ENGAGEMENT ON THE 60% WASTE DIVERSION ACTION PLAN

The following community engagement is proposed for the 60% Waste Diversion Action Plan.

Table 8 - Community Engagement for 60% Waste Diversion Action Plan

Date	Event	Comments
July 17, 2018	CWC Meeting	• Approve in principle Draft Action Plan to achieve 60% waste diversion by 2022 • Approve to circulate and receive feedback on the 60% Waste Diversion Action Plan
July 24	Council	
July 25 to September 10	Provide feedback opportunities on WhyWaste Resource Recovery Strategy website	• Advertise in the London Free Press, The Londoner and on social media
	Circulate to Community Stakeholder Groups	• Circulate and ask for feedback from Waste Management Community Liaison, Committee (WMCLC), W12A Landfill Public Liaison Committee, Urban League and Advisory Committee on the Environment (ACE)
	Circulate to Waste Management/ Recycling Companies	• Circulate and ask for feedback from local companies including Emterra, Green Valley Recycling, Miller Waste, Orgaworld, StormFisher, Try Recycling, Waste Connections and Waste Management
	Community Festival	• Attend Gathering on the Green II, Sunday August 19, 2018
	Presentations	• Present to WMCLC in early August (TBD) • Present to ACE on September 5, 2018
September 27	Public Participation Meeting	• CWC receives comments from the public and other stakeholders
January/ February 2019	CWC Meeting	• Approval of 60% Waste Diversion Action Plan • Implementation details and final cost estimates to be provided at this time
	Council	

3) RESIDENTIAL GARBAGE COMPOSITION

3.1 OVERVIEW

The key to developing new programs and initiatives to achieve 60% waste diversion is understanding what currently makes up garbage and how it may change in the future.

3.2 CURRENT GARBAGE COMPOSITION

What is currently in the garbage is shown on the next pages and discussed below. A more detailed breakdown on what is in garbage is provided in Appendix E. Single families make up about 70% of London's households and generate about 61,000 tonnes of the residential garbage each year that is collected and landfilled. A large percentage of this waste could be composted or recycled.

A breakdown of what is in the typical garbage bag from a single family residence is illustrated on Figure 2 (next page). About 7% is material that should have been placed in the Blue Box. A further 13% of the garbage, including textiles, scrap metal, electronics, renovation materials and plastic bags, which could have been dropped off at a depot, taken to a store for recycling or are materials that have been identified in the province's Strategy for a Waste-Free Ontario for future diversion programs.

About 60% of landfill garbage is primarily organic matter and is compostable. The organics are made up of food scraps (36% of all waste), non-recyclable paper like paper towel & paper napkins, yard materials, pet waste and sanitary products (e.g., diapers).

About 30% of London's households live in multi-residential (apartment/condominium) buildings and generate approximately 23,000 tonnes of garbage per year. A breakdown of the garbage collected from multi-residential buildings is illustrated in Figure 3.

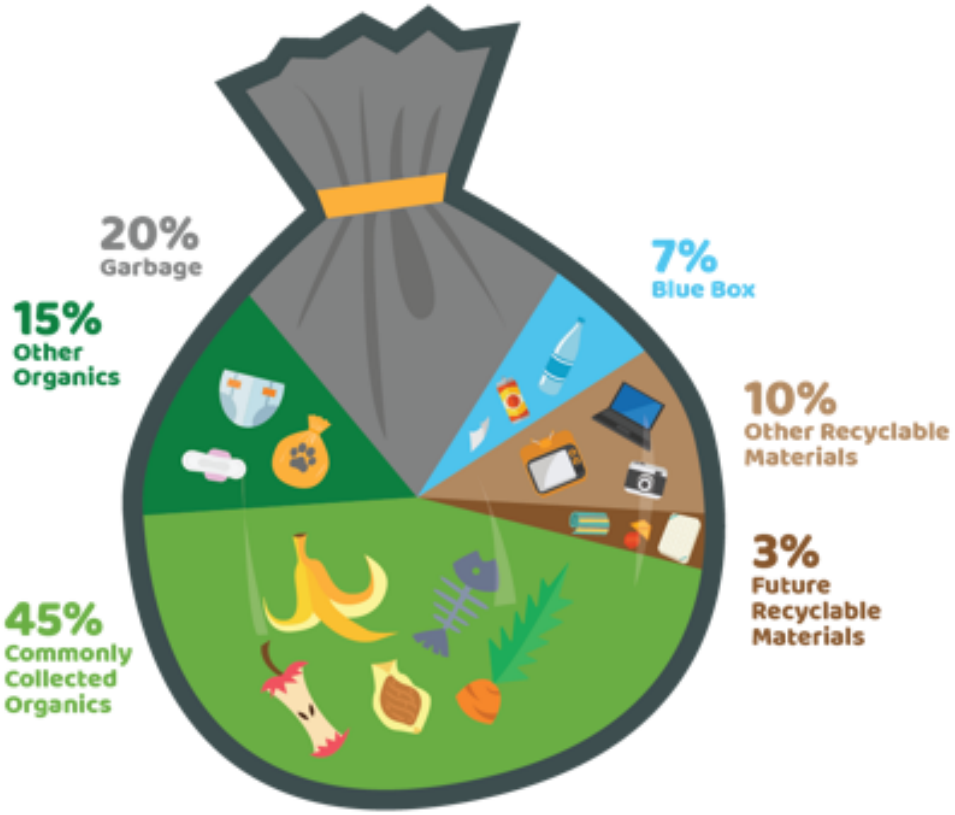
Garbage Collection

The City collects garbage from 124,000 single family households and 56,000 multi-residential households.

Single family households are limited to 3 containers per collection plus bulky items (e.g., couches, mattresses, etc.).

Multi-residential households do not have container restrictions. Bulky items are handled separately by tenant/owner or the building owner.

Figure 2 - What Are We Throwing Away? (single family homes)



Commonly Collected Organics

Organics that are easily composted. They include food waste and non-recyclable paper (soiled paper, tissues, paper towels).

Other Organics

Pet waste and sanitary products (e.g., diapers) which typically require pre-processing to remove the plastic bag that contains the pet waste and plastic covering of the diaper.

Blue Box

Items that were placed in the garbage but should have gone in the Blue Box.

Other Recyclable Materials

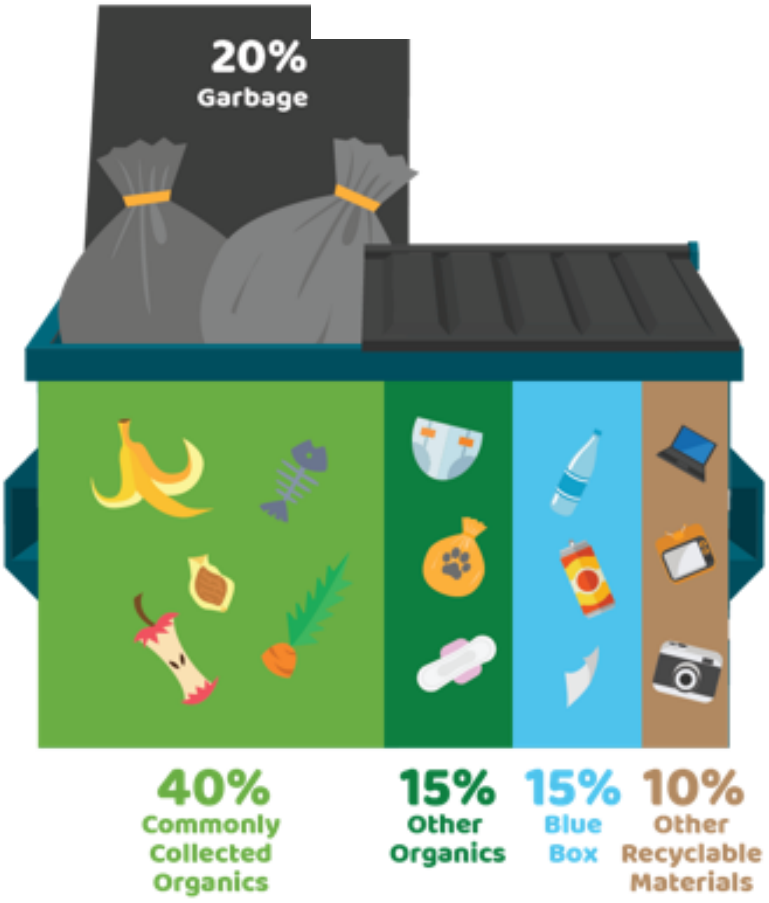
Items that were placed in the garbage but should have been dropped off at a depot or returned to retailer for recycling such as textiles, scrap metal, electronics, renovation materials and plastic bags.

Future Recyclable Materials

Items that may have local recycling options in the future such as carpets, mattresses and furniture.

The garbage composition 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 (15% versus 7% for single family) but less of the garbage is compostable (55% versus 60% for single family).

Figure 3 - What Are We Throwing Away? (multi-residential homes)



Commonly Collected Organics

Organics that are easily composted. They include food waste and non-recyclable paper (soiled paper, tissues, paper towels).

Other Organics

Pet waste and sanitary products (e.g., diapers) which typically require pre-processing to remove the plastic bag that contains the pet waste and plastic covering of the diaper.

Blue Box

Items that were placed in the garbage but should have gone in the Blue Box.

Other Recyclable Materials

Items that were placed in the garbage but should have been dropped off at a depot or returned to retailer for recycling such as textiles, scrap metal, electronics, renovation materials and plastic bags.

3.3 FUTURE GARBAGE COMPOSITION

The waste stream is constantly changing. These changes are a result of:

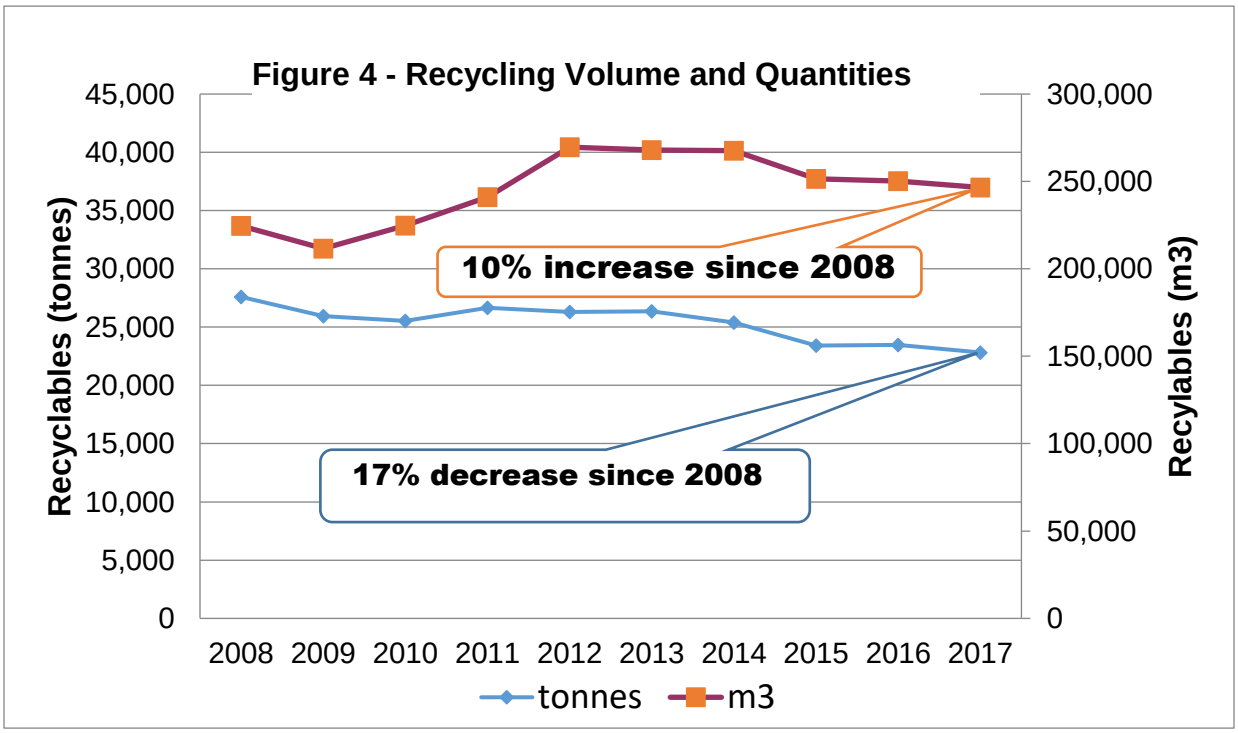
- Shifting habits and behaviours - fewer people reading printed newspapers resulting in less newsprint to recycle; more people ordering online resulting in more cardboard boxes; changes in eating habits, attitudes toward cooking and busier lifestyles have resulted in a growing demand for convenience foods and ready-to-go meals.

- Light-weighting of product packaging to reduce manufacturing costs - companies find ways to reduce the weight of product packaging, to reduce their costs. Examples include; the quantity of polyethylene terephthalate (PET) plastic in beverage containers (e.g., water bottles) has decreased by 50% over the last several years; more concentrated products which use less packaging.

- Material substitution - some companies are switching packaging materials such as steel cans or glass containers to plastic or aseptic packaging.

- Composite packaging design - there is an increase in single-serve and convenience packaging which results in challenges for recycling and composting operations (e.g., coffee pods, multi-layer freezer packs).

The majority of these changes will impact Blue Box recycling and result in less “easy to recycle” materials (e.g., newspapers, steel cans, etc.) and more “difficult to recycle” materials (e.g., plastics, pouches, etc.). The changes will also reduce the weight of recyclables collected while at the same time increasing the volume of recyclables (Figure 4) and the cost of recycling.



4) ANALYSIS AND PROPOSED ACTIONS

4.1 BLUE BOX (BLUE CART) PROGRAM

Summary - Proposed Actions, Diversion and Savings

It is expected:

- the responsibility for the Blue Box program will be transferred to industry in the future (as early as 2023 based on current legislation and policy timelines;
- the province will mandate increased capture of recyclables from the current 63% (provincial average) to 75%; and
- other proposed initiatives (bi-weekly garbage collection, reduced container limits, consideration of user pay or clear bags) will encourage more use of the existing program.

These changes will increase London's diversion rate by an additional 2% to 3% and the transition of all Blue Box costs to industry will reduce the City's waste diversion costs by $1.5 to $1.8 million dollars per year.

Background

Existing Program

The City provides opportunities to recycle Blue Box materials through its curbside, multi-residential, depot and public space recycling programs. The City diverted approximately 23,000 tonnes of recyclables in 2017. This is approximately 14% of all residential garbage.

The City collects a wide range of materials which has increased over the years. Most items in the Blue Box are common to municipalities, with the key differences being: plastic film (e.g., plastic bags) and expanded polystyrene (e.g., Styrofoam™). London has not added plastic film and expanded polystyrene to its program due to the high costs and limited markets.

Why doesn't the City recycle Expanded Foam Polystyrene (EPS) and film plastic?

- ✓ EPS does not have stable markets and can contaminate other materials at the recycling facility.
- ✓ Film plastic wraps around moving equipment parts at the recycling facility and is costly to collect and process.

It is expected that a common basket of materials to be recycled will be established once responsibility for the program is transferred to industry. For this reason, no changes to the materials collected are planned for London in the near future.

Information on materials collected in the City's Blue Box program can found in Appendix A.

New Provincial Direction

The existing Blue Box Program Plan (2003) is based on a cost share model of 50/50 between municipal governments and the companies that produce the Paper Products and Packaging (PPP) collected in the Blue Box Program. The programs are being managed and operated by Ontario municipalities.

The new proposed model is a combination of extended producer responsibility (EPR) and eventually moving to Individual Producer Responsibility (IPR) (also commonly called full producer responsibility). It is based on individual producers being legally and fully responsible for meeting outcomes set by the government, which would include waste diversion targets, service standards, promotion and education requirements and administrative penalties. Industry would fund 100% of the recycling costs of their products and product packaging.

The current Blue Box program diverts approximately 63% of all designated recyclables. The province has indicated that a capture rate of 75% of all designated recyclables may be more appropriate under the new model.

The Strategy for a Waste–Free Ontario (2017) shows the transition of the Blue Box Program to the new model being completed by 2023. In February 2018, Resource Productivity and Recovery Authority (RPRA) announced that “In light of comments received on this consultation draft [the report cover above], Stewardship Ontario and the Authority have determined that more time is needed to address the comments received.” As of end of June 2018, no further details have been released.

4.2 NEW (OR EXPANDED) RECYCLING PROGRAMS AND INITIATIVES

Summary - Proposed Actions, Diversion and Costs

The proposed program for materials collected in the garbage that are potentially recyclable is summarized in Table 9.

Table 9 – Summary of Proposed New (or Expanded) Recycling Programs and Initiatives

Material	Proposed Actions	Implementation Schedule
Bulky Plastics	• Continue with existing pilot project • Consider implementation of an expanded program once long term stable markets have developed	in progress
Clothing and Textiles	• Develop a textile awareness strategy • Pilot depot collection at select multi-residential buildings	2019
Ceramics (e.g., Toilets)	• Drop-off at W12A EnviroDepot at no cost	2019
	• Ban from garbage collection	2020
Small Metal (e.g., Appliances, Electrical Tools and Scrap Metal)	• Pilot curbside collection methods	2019
	• Semi-annual collection of from single family home	2020
	• pilot depot collection at select multi-residential buildings	2020
Furniture (Wooden)	• Drop-off at W12A EnviroDepot at no cost	2019
	• Semi-annual curbside collection from single family homes	2020
	• Ban from garbage collection	2021
Carpets, Mattresses	• Wait to see if the province develops an EPR program under the *Waste-Free Ontario Act*	2018 to 2021
	• If no EPR program, implement a pilot project for voluntary recycling of materials at the EnviroDepots on a fee for service basis	2022
	• Consider implementation of ban on curbside collection with either a depot or curbside collection service	2023

It is estimated that the above programs for wooden furniture; small appliances, electrical tools and small scrap metal; large ceramics and textiles would divert approximately 0.4% to 0.8% of residential waste and cost approximately $350,000 to $550,000 annually.

Background

Existing Programs

There are many opportunities to recycle items in the residential waste stream in addition to materials recycled through the Blue Box program. In total approximately 13,000 tonnes of Other Recyclables were diverted from landfill in 2017. Details on these City programs are provided in Appendix A.

Waste-Free Ontario Strategy

Information on the Waste-Free Ontario Strategy was previously provided in Section 1.2. The strategy lists a number of products and materials that will be considered for recycling under a full EPR program.

"*The province will designate new materials under the new producer responsibility regime. When identifying potential candidate materials for full producer responsibility, the province will consider products and packaging whose recovery helps fulfil one or more of the following three broad results:*

- *recovering high-volume resource streams to increase diversion*
- *keeping hazardous materials out of landfills to protect our environment*
- *reducing domestic and global greenhouse gas emissions to fight climate change*

…Materials will be designated through regulations made under the Resource Recovery and Circular Economy Act, 2016. Based on previous consultations, the first set of materials will include, but is not limited to

- *small appliances*
- *electrical tools*
- *batteries*
- *fluorescent bulbs and tubes*
- *mattresses*
- *carpets*
- *clothing and other textiles*
- *furniture and other bulky items"*

Potential Products/Materials

The status of programs to manage each of the materials listed in the Waste-Free Ontario Strategy as well as other potential recyclable materials are presented in Table 10.

Table 10 - Status of Potential Materials to Recycle

Product/ Materials		Status	Estimated Quantity in Garbage (tonnes/year)
Batteries		• most batteries end up in the garbage • provincial recycling program already exists	<50
Bulky Plastics		• Some bulky plastics are collected at the curb and from multi-residential buildings • City operates a pilot recycling program	50 to 100
Carpets		• carpets collected at the curb for single family homes • carpets not collected from multi-residential buildings • No existing recycling opportunities	600 to 800
Ceramics		• ceramics (including toilets) are collected at the curb • ceramics (excluding toilets) are collected at multi-residential buildings • ceramics can be recycled at local Construction, Renovation and Demolition (CR&D) recycling companies	500 to 600
Clothing and other textiles		• 50% of material in garbage may have reuse potential • many drop-off depot locations already exist	2,500 to 3,000
Small Metal	Electrical tools	• most electrical tools end up in the garbage • most are recyclable as scrap metal	<100
	Small appliances	• most small appliances (e.g., toasters, hand mixers, etc.) end up in the garbage • many of these are recyclable as scrap metal or electronics	200 to 250
	Scrap Metal	• many smaller pieces of scrap metal from households (e.g., frying pans, baking pans, bottle caps, etc.) end up in the garbage instead of being recycled	600 to 700

Table 10 - Status of Potential Materials to Recycle

Product/ Materials	Status	Estimated Quantity in Garbage (tonnes/year)
Fluorescent bulbs and tubes	• many bulbs end up in the garbage • provincial recycling program already exists	<50
Furniture	• furniture in general is primarily wood, metal, upholstered or plastic • metal furniture is banned from collection and can be recycled as scrap metal • wood and upholstered furniture is collected from single family homes but not multi-residential buildings (that have City bulk bin collection)	300 to 500
Mattresses	• mattresses collected at the curb for single family homes • mattresses not collected from multi-residential buildings (that have City bulk bin collection) • no existing recycling opportunities	600 to 800

A detailed assessment of recycling the items in Table 10 is presented in Appendix F and summarized below.

Batteries

There are over 20 retail locations, 30 businesses and schools and 4 EnviroDepots where single-use and rechargeable batteries are collected for recycling in London.

Several municipalities in Ontario have implemented semi-annual collection of batteries in conjunction with their Blue Box program. It is estimated a similar program in London would divert approximately 20 to 30 tonnes of batteries. Semi-annual collection is not recommended for London because the expected transition of the Blue Box program to industry will complicate collection. In addition the province will likely develop new provincial programs for batteries under the *Waste-Free Ontario Act*.

It is recommended not to make any changes to the current program in the City at this time.

Bulky Plastics

The City has been piloting the recycling of bulky plastics at the Manning Drive Regional Material Recovery Facility.

Recently, the scrap plastics market has increased quality requirements. Bulky plastic loads must now have no or minimal metal, fabric, paper and other contaminants or they will be rejected. This standard is difficult to achieve since many bulky plastics like toys are multi-material items and may also contain some metal or fabric components.

The pilot project could be become a city-wide program by banning collection of bulky plastics at the curb coupled with accepting bulky plastics at the EnviroDepots. There are insufficient bulky plastics to warrant occasional (e.g., semi-annual) collection at the curb. The cost of collecting bulky plastics using a depot system would be approximately $8,000 to $16,000 per year.

Bulky Plastics

- Bulky Plastics refers to all larger plastic household items that are not suitable for the Blue Box. Typical bulky plastic items includes plastic lawn furniture, large toys and 20 litre pails.
- It is estimated that 50 to 100 tonnes of bulky plastics placed in the garbage annually.

It is recommended that the City not make changes to its pilot project for recycling bulky plastic recycling until long term stable markets have developed.

Carpets

It is estimated that approximately 600 to 800 tonnes of carpet are discarded by homeowners and collected curbside annually as garbage.

The City could ban the collection of carpet at the curb coupled with accepting carpet discards at the EnviroDepots. Occasional (e.g., semi-annual) collection at the curb is not recommended because of the added cost (cannot be collected with existing garbage collection vehicles) and the reduced recyclability of the carpet if it is left at the curb for an extended period prior to collection.

Carpet Recycling

- There is one carpet recycling facility in Ontario located in Toronto.
- There are no municipal programs for recycling carpets in Ontario.
- California has the most extensive carpet recycling program in North America:
  - Captures 11% of discards
  - 80% of captured material is diverted from landfill (equal amounts sent to reuse/ recycling facilities and energy production through energy-from-waste facilities).

It is estimated that a depot service would capture at least 600 to 800 tonnes per year if collection of carpets at the curb was banned and accepted at no cost at the EnviroDepots. The cost of the program would be approximately $220,000 to $290,000 per year (excluding initial capital costs).

It is expected that a depot system would only collect 200 to 300 tonnes per year if a fee was charged to recover the cost of the program as some of the carpets would be taken to cheaper disposal locations within and outside of the City.

It is recommended that the City:

- Wait to see if the Province develops a provincial program for carpets under the *Waste-Free Ontario Act* as there are limited markets for recycling carpets in the province.
- If no provincial program exists by 2021, implement a pilot project for voluntary recycling of carpets discards at the City EnviroDepots at no cost while continuing to collect carpets at the curb.

Data from the pilot project would be used to confirm the costs, operational needs, and logistics of moving to a ban of carpet collection at the curb and whether to offer the program for free, on a partial recovery basis or on a full cost recovery basis. The cost of a one year pilot project is estimated to cost $80,000 to $100,000.

<u>Ceramics</u>

It is estimated that there is between 500 and 600 tonnes of ceramics in the garbage annually. Ceramics can be easily crushed and recycled as aggregate, which is how ceramics like ceramic tiles and toilets taken to local Construction, Renovation & Demolition (C,R&D) recycling companies are recycled.

Occasional (e.g., semi-annual) collection at the curb is not recommended because of the low quantities coupled with the likelihood that residents would be unwilling to hold onto ceramics (including toilets) for an extended period.

It is recommended that the City:

- Provide a drop-off location for ceramics at no cost at the City's EnviroDepots in 2019; and,
- Ban collection of toilets at the curb in 2020.

It is estimated the above measures will divert 100 to 150 tonnes of ceramics (predominately toilets) and cost $10,000 to $15,000 per year (excluding initial capital costs).

Clothing and Textiles

An active community-based clothing and textile program already exists in London handling about 50% of the available material. It is estimated that there is 2,500 to 3,000 tonnes of textiles in the garbage annually of which approximately 50% has potential to be reused/recycled. Approximately 70% of this material comes from single family homes and 30% from multi-residential buildings. This means there is approximately 900 to 1,050 tonnes of reusable textiles in the garbage from single family homes and 350 to 450 tonnes in the garbage from multi-residential homes.

There are many options for donating textiles in good condition. They include un-staffed drop-off bins at stores and mall parking lots, staffed drop-off depots (Goodwill, Mission Store, St. Vincent de Paul, etc.), door to door collections (Diabetes Canada's '*In The Bag*' program) and picked up at your home (Diabetes Canada's reusable goods donation program).

There are no major municipalities in Ontario that offer regular curbside collection of textiles. Some large municipalities have textile drop-off bins in select multi-residential buildings or at key locations through the municipality (e.g., City of Markham).

The province may develop a new provincial program for clothing and textiles under the *Waste-Free Ontario Act* in the future but many municipalities are taking measures to increase diversion of clothing and textiles in the interim as there are markets for textile reuse and recycling.

Textile Recycling

- London has an active community-based program that reuses/ recycles approximately 3,300 tonnes of clothing and textiles annually
- There are approximately 1,200 to 1,500 tonnes of useable clothing and textiles in the garbage.
- The overall diversion rate of useable clothing and textiles is approximately 70% (3,300 tonnes reused/ recycled of a total of 4,500 to 4,800 tonnes of useable clothing and textiles).

It is recommended that the City:

- Develop a textile awareness strategy to promote existing reuse opportunities; and,
- Pilot depot collection at select multi-residential buildings beginning in 2019.

It is estimated that a textile awareness program would cost $10,000 to $30,000 annually and be required for 3 to 5 years followed by less investment when the practice has become the norm. A pilot depot collection project would cost between $5,000 and $10,000. It may be possible to generate enough textiles from multi-residential buildings to pay for the on-going cost of a permanent program. These programs are estimated to divert 150 to 400 tonnes of clothing and textiles annually.

Small Metal (Small Appliances/Electrical Tools/Scrap Metal)

It is estimated that 800 to 1,000 tonnes of small appliances (e.g. toasters, hand mixers, etc.), electrical tools and small pieces of scrap metal end up in the garbage annually even though these materials can be taken to an EnviroDepot or scrap metal yard to be recycled. Approximately 75% of this material (600 to 750 tonnes) comes from single family homes and 25% (200 to 250 tonnes) from multi-residential buildings.

The province may develop a new provincial program for small appliances and electrical tools under the *Waste-Free Ontario Act* in the future but measures to increase diversion of these materials can be taken in the interim. There are strong markets for scrap material and collection can be provided at a reasonable cost.

In order to divert more of this material from the waste stream, it is recommended that the City:

- Implement semi-annual curbside collection of small metal items beginning in 2020, and;
- Pilot depot collection at select multi-residential buildings beginning in 2020.

A few Ontario municipalities allow residents to put metal cookware in their Blue Box and some offer a call-in service for the pickup of large appliances, but none offer a dedicated collection of small appliances, electrical tools and small pieces of scrap metal. Various methods of curbside collection could be piloted in 2019 prior to implementing a City-wide program.

Possible Curbside Collection Parameters

- Limit items to the size of a Blue Box or smaller.
- Accept all appliances, electrical tools, small electronics or other items with a cord.
- Consider use of the Blue Box or similar container to place materials at the curb.

It is estimated that a semi-annual curbside collection program would capture 250 to 400 tonnes of material, cost $70,000 to $80,000 to collect and generate $40,000 to $60,000 in revenue. It is likely much of the metal will be collected by private scrap haulers before City collection crews arrive. This will reduce potential revenue but also reduce collection costs.

Fluorescent bulbs and tubes

Fluorescent bulbs and tubes are accepted for recycling at several retail locations and the City's four EnviroDepots. The four EnviroDepots received 20 tonnes of fluorescent bulbs and tubes in 2017. The amount being received is expected to gradually decrease over time as most light bulbs currently being sold are LED. It is expected the province will likely develop new provincial programs for fluorescent bulbs and tubes under the *Waste-Free Ontario Act*.

It is recommended not to make any changes to the current program in the city at this time.

Furniture

Furniture is generally comprised of wood, metal, plastic and/or upholstery. Metal furniture is banned from collection and can be recycled as scrap metal. Wood, plastic and upholstered furniture is collected from single family homes for disposal but not multi-residential buildings (with bulk bin garbage collection).

Wood and upholstered furniture in poor condition is placed at the curb for disposal. It is estimated that the City collects 300 to 500 tonnes of furniture annually from single family homes and about one third is wood furniture. Wood, plastic and upholstered furniture in good condition should be donated for reuse but some is placed at the curb for disposal.

There are no recycling options for upholstered furniture in poor condition. Plastic furniture would likely be part of the bulky plastics recycling program discussed early.

The only recycling option for wood furniture, at this time, is to use as wood chips for daily cover at the landfill. The minor metal and plastic components (e.g., handles, drawer sliders, etc.) coupled with the wood being painted or stained prevents the wood chips from being used as fuel or for landscaping purposes.

The province may develop a new provincial program for furniture under the *Waste-Free Ontario Act* in the future. It is recommended by 2020 the City:

Furniture Recycling

Metal

Several large Ontario municipalities offer a call-in service for the collection of large metal items for recycling including furniture.

Upholstered

There is no recycling of upholstered furniture by municipalities in Ontario.

Plastic Furniture

There is no recycling of plastic furniture by municipalities in Ontario.

Wood

There are no large Ontario municipalities that collect wood furniture for processing into wood chips. The Municipality of Thames Centre provides semi-annual collection of wood, including furniture and ships to Try Recycling for processing.

- Wait to see if the Province develops a provincial program for upholstered furniture under the *Waste-Free Ontario Act* as there are no markets for recycling upholstered furniture in the province;
- Provide a drop-off location at W12A EnviroDepot for wood furniture in 2019;
- Begin semi-annual collection of wooden furniture in 2020; and,
- Ban wooden furniture from curbside garbage collection in 2021.

It is estimated the above measures will divert 100 to 150 tonnes of waste to be used as landfill cover and cost $70,000 to $80,000 annually. Having all the wooden furniture collected semi-annually, instead of a call-in service, will provide an opportunity for re-use of the furniture by residents who see furniture on the street they could use.

Mattresses

It is estimated approximately 1,000 to 1,200 tonnes of mattresses and box springs are discarded by homeowners annually or about 50,000 to 60,000 units. About 60% of these are placed at the curb for garbage collection.

The City could ban the collection of mattresses and box springs at the curb coupled with accepting them at the EnviroDepots. Providing occasional (e.g., semi-annual) or on-request collection at the curb is not considered practical at this time due the cost of providing such a service.

It is estimated that a depot service would capture at least 600 to 800 tonnes per year if collection of mattresses and box springs at the curb was banned and accepted at no cost at the EnviroDepots. The cost of the program would be approximately $600,000 to $700,000 per year (excluding initial capital costs).

It is expected that a depot system would only collect 200 to 300 tonnes per year if a fee was charged to recover the cost of the program as some of the mattresses would be taken to cheaper disposal locations within and outside of the City.

Mattress Recycling

- There are two mattress recycling facilities in Ontario (located in Barrie and Toronto).
- Over 90% of the material in mattresses and box springs can be recycled.
- The largest municipality with a recycling program is the City of North Bay. Residents must take mattress to a drop-off depot and are charged $20 to cover costs.

It is recommended that the City:

- Wait to see if the Province develops a provincial program for mattresses under the *Waste-Free Ontario Act* as there are limited markets for recycling mattresses in the province.
- If no provincial program exists by 2021, implement a pilot project for voluntary recycling of mattresses and box springs at the City EnviroDepots at no cost while continuing to collect mattresses and box springs at the curb.

Data from the pilot project would be used to confirm the costs, operational needs and logistics of moving to a ban of mattress collection at the curb and whether to offer the program for free, on a partial recovery basis or on a full cost recovery basis. The cost of a one year pilot project is estimated to cost $150,000 to $250,000.

4.3 CURBSIDE ORGANICS MANAGEMENT PROGRAM

Summary - Proposed Actions, Diversion and Costs

The proposed organics collection program for curbside homes is:

- Implement curbside Green Bin program
- Implement bi-weekly garbage collection

It is estimated that the proposed program will increase London's diversion rate by approximately 8% to 12% and have an annual operating cost $3.9 to $5.5 million.

Background

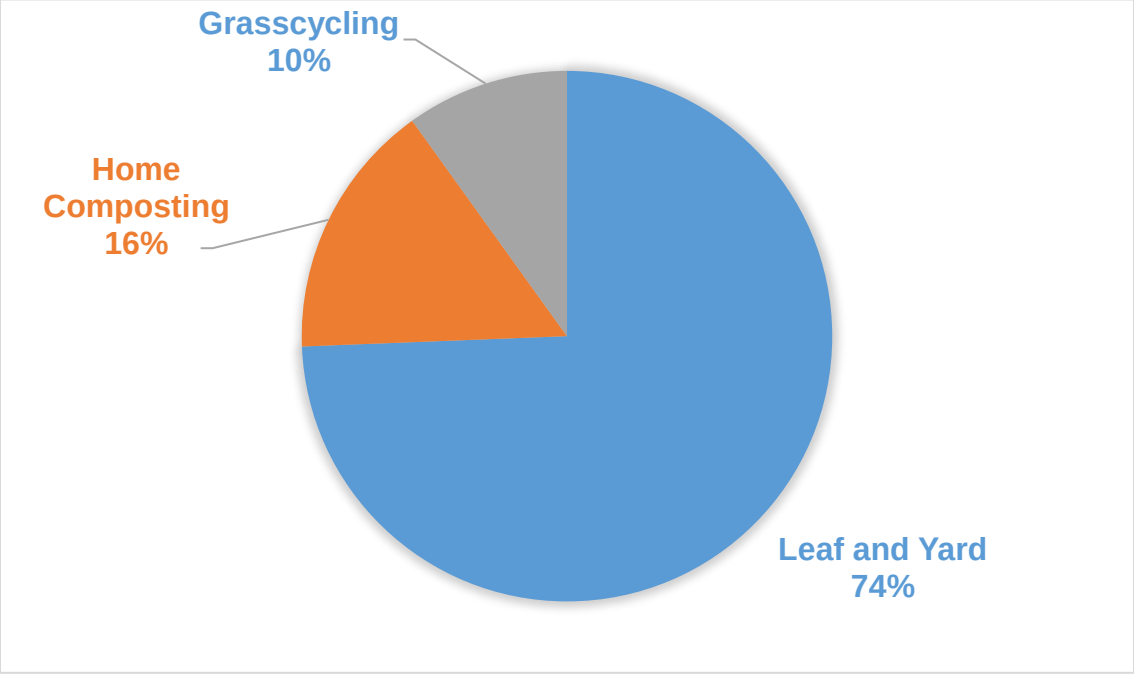
Existing Programs

The City has a number of programs in place to divert organics from single family residences; home composting, grasscycling (ban on the collection of grass trimmings and pay-per-bag to drop-off grass at EnviroDepots), curbside collection of yard waste, drop-off of yard waste at EnviroDepots and a Christmas tree collection program. The City currently diverts 36,000 tonnes of organics. This represents 50% of commonly collected organics. Commonly collected organics refers to yard waste, food scraps, soiled paper, tissues, etc. but does not include pet waste and sanitary products.

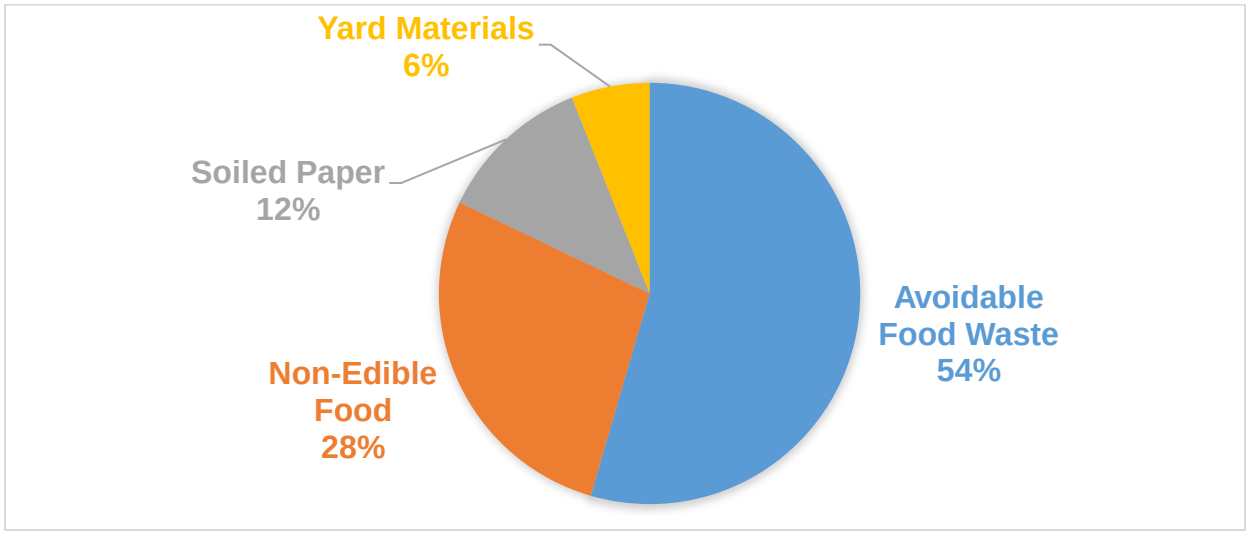
Figure 5 provides a breakdown of the various types of organics in the waste stream.

Figure 5 – Organics Breakdown

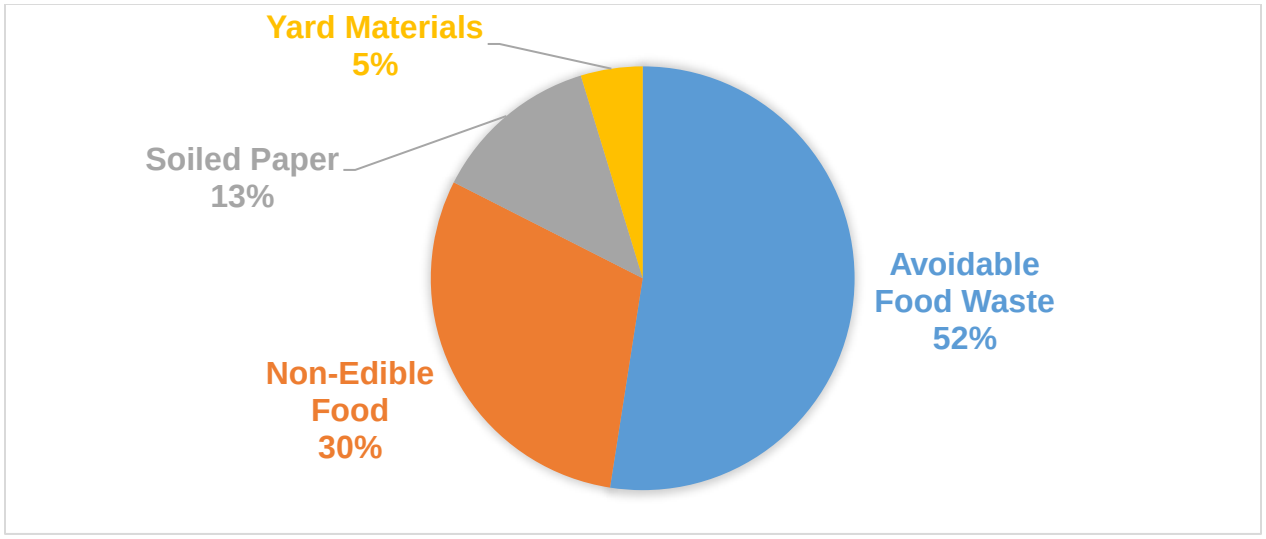
5a) Organics Diverted 36,000 tonnes



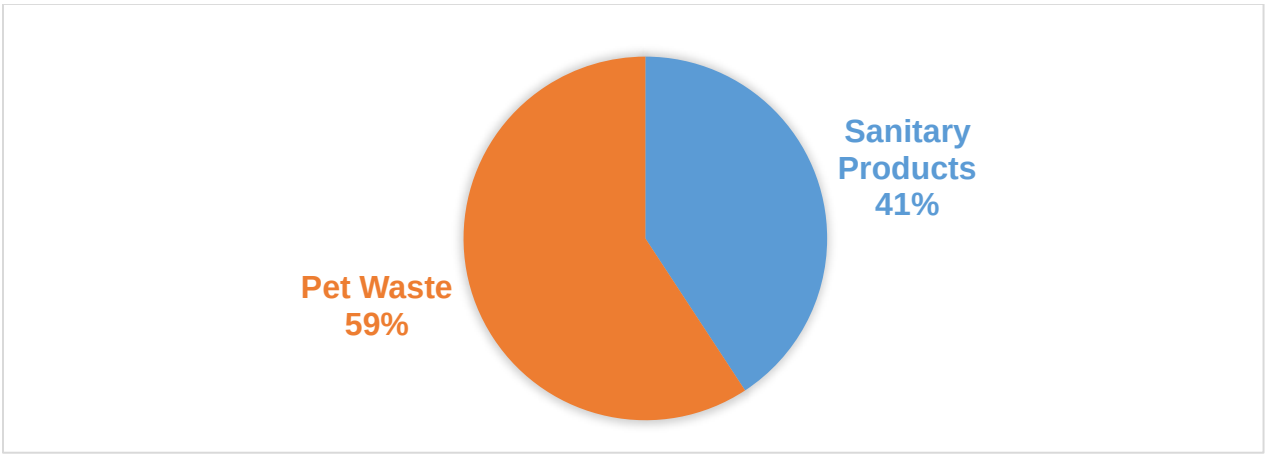
5b) Commonly Collected Organics Curbside in the garbage - 27,000 tonnes



5c) Commonly Collected Organics Multi-Residential in the garbage - 9,000 tonnes



5d) Other Organics in the garbage - 14,000 tonnes (11,000 tonnes curbside, 3,000 tonnes multi-residential)



Getting to 60% waste diversion will not be possible without an organics program because so much of the garbage currently collected is organics. As shown in Figure 5b and 5c, approximately 40% to 45% of garbage consists of "commonly collected organics" such as food waste and tissues/towelling and a further 15% of more "difficult to manage" organics like pet waste and sanitary products. Some of these organics will be reduced by proposed food waste avoidance, community composting and home composting programs (see Section 4.5) but the majority of organics will remain in the garbage without a city-wide collection program to divert this waste. Options for managing these organics are a Green Bin (source separated organics) program or a mixed waste processing program.

Green Bin Program – Homeowners place organics from their household in a "Green Bin" container which is collected separately from garbage. Green Bin programs typically capture 50% to 60% of the organics when garbage is collected bi-weekly and less if garbage is collected weekly. Details on existing programs in Ontario are presented in Appendix G.

The organics can be processed anaerobically or aerobically. Most existing processing facilities in the Province are at capacity or too far away to be practical. Available processing options for London include:

- Orgaworld (London)
- Seacliffe (Leamington, 2 hours away)
- Pre-process at Waste Management Resource Recovery Area beside the W12A Landfill site and ship to StormFisher (London) or several small farm digesters
- Build a facility in the Waste Management Resource Recovery Area beside W12A Landfill

Mixed Waste Processing – Garbage is separated into two or more waste streams for further processing. Further processing can include anaerobic or aerobic processing of an organics rich stream, capture of low quality recyclables, and production of a refuse derived fuel (RDF) or solid recovered fuel (SRF).

There are two permanent facilities in Canada (Edmonton and Halifax). There is one facility in Ontario that is piloting mixed waste processing (Canada Fibers Dongara High Diversion Facility in Toronto). It may be able to process London's mixed waste and remove the organic fraction and other materials.

The City also has the option of building its own facility.

Food and Organic Waste Policy Statement

As discussed in Section 1.2, the Ministry of the Environment and Climate Change (now the Ministry of Environment, Conservation and Parks) issued the Food and Organic Waste Policy Statement on April 30, 2018. The document establishes the following targets and timelines:

- larger municipalities that currently do not have a Green Bin program (like the City of London) need to implement an organics management program that will achieve at least a 70 per cent waste reduction and resource recovery of food and organic waste generated by single-family dwellings by 2025.

- multi-residential buildings need to implement an organics management program that will achieve at least a 50 per cent waste reduction and resource recovery of food and organic waste by 2025.

The document states the:

"*collection of source separated food and organics waste is the preferred method of servicing single family dwellings*" but notes that "*alternatives to the collection of source separated food and organics waste may be used if it is demonstrated that provincial waste reduction and resource recovery targets can be achieved efficiently and effectively*".

Mixed Waste Processing Pilot

In 2016, Canada Fibers bought the idle Dongara waste processing facility which previously had been used to process garbage into refuse derived fuel (RDF) pellets. The facility closed partly due to the regulatory and approval issues with using the RDF. Canada Fibers repurposed the facility and has run pilot projects using the facility as a mixed waste processing facility and as a material recovery facility. Toronto, Peel and London have all sent garbage to this facility to learn more about mixed waste processing. Details of the London pilot project are provided in Appendix H. Capture rates from the pilot project are summarized in Table 11. Estimated capture rates for a new purpose-built mixed waste processing area also provided in Table 11.

Table 11 - Summary of Mixed Waste Processing Pilot Capture Rates

Component	Canada Fibers MWP Facility	New Mixed MWP Facility
Organic Rich Fraction (including moisture loss)	25% to 30%	35% to 45%
Recyclables	3% to 5%	5% to 15%
RDF or upgraded to SRF	0% to 10%	0% to 20%
Total Percentage Captured[1]	30% to 40%	50% to 70%

Notes: 1. Cannot add maximum value for individual components. For example, facilities that maximize SRF production will have decreased organic rich fraction.

Comparison

A comparison of a Green Bin program versus a mixed waste processing program for managing curbside organics is presented in Table 12.

Table 12 - Comparison of Green Bin and Mixed Waste Processing Programs

Factor	Comment
Environmental	• A mixed waste processing program potentially captures 25% to 80% more organics, reduces greenhouse gases (GHG) by a corresponding amount and opens up the possibility of producing solid recovered (SRF).
Financial	• A Green Bin program costs approximately $30 to $45 per year to service a curbside household (about 124,000 households) compared to $70 to $115 per year to undertake mixed waste processing for the same households.
Social	• Mixed waste processing program offers more convenience to residents (no change to how they manage waste).
Technical	• The rules and regulations around mixed waste processing are evolving as current regulations do not explicitly address mixed waste processing or the products produced. • There is limited experience with mixed waste processing in Canada. Past experience has not been positive in Canada and parts of North America. Facilities have either been closed (e.g., Three County (Total Recycling) System, Aylmer, Ontario; Plasco Energy Group, Ottawa, Ontario; SUBBOR, Guelph, Ontario; Dongara Pellet Plant, Vaughan, Ontario; Conporec Integrated Waste Management & Composting, Sorel-Tracy, Quebec; and several facilities in the United States) or retooled away from partially mixed waste processing or similar systems to source separated systems (e.g., City of Guelph wet/dry recycling; City of Moncton wet/dry recycling). This includes a recent decision in the City of Edmonton (March 2018) not to re-open its mixed waste processing facility in favour of progressing with a source separated organics collection program (see additional details on the next two pages). • Modern mixed waste processing systems in Europe appear to have addressed many of the earlier challenges; however, the track record in North America is very limited at this time. This is expected to change in the next two to five years. • Green Bin is the preferred method in the provincial Food and Organic Waste Framework and Policy Statement.

Recent information and/or decisions on mixed waste processing

[Extracts from]

Metro Vancouver, British Columbia

To: Zero Waste Committee
From: Paul Henderson, General Manager Solid Waste Services
Date: May 29, 2013 Meeting Date: June 6, 2013
Subject: **Review of Mixed Waste Material Recovery Facilities**

CONCLUSION
Staff from Metro Vancouver and the City of Vancouver visited mixed waste processing facilities in California in late April 2013 to examine their governance, operation, and performance. Mixed waste processing facilities visited were found to be high cost and recover limited recyclables. Facilitating the development of private sector MWMRFs in Metro Vancouver would be inconsistent with the ISWRMP and disadvantage local recyclers that depend on source separated materials.

[Extracts from]
THE REGIONAL MUNICIPALITY OF PEEL
WASTE MANAGEMENT STRATEGIC ADVISORY COMMITTEE AGENDA
DATE: Thursday, November 30, 2017

Mixed Waste Processing
Staff completed a feasibility study of Mixed Waste Processing to process Peel's garbage as a complement to source separation programs to help meet the Region's target of 75 percent 3Rs waste diversion.

Across North America (and within Canada) there are many examples of Mixed Waste Processing facilities that did not meet expectations. This is especially true of the low carbon fuel component but also true of the organics fraction. Removing grit and contamination from the organics fraction will not be easy but there are examples in Europe where this is done successfully, so staff believes it can be done. Producing low carbon fuel that consistently meets market specifications is even more difficult, with very few examples of this being done successfully.

- Mixed Waste Processing may not be able to successfully divert organics if the province applies new product quality requirements that preclude the use of material derived from mixed waste. The quality requirements applicable to the organic output of Mixed Waste Processing must be confirmed.

- The organic output of Mixed Waste Processing may not consistently meet product quality requirements, particularly for heavy metals, so long as items of household hazardous waste are present in the garbage. Programs or policies to eliminate household hazardous waste from the garbage should therefore be maintained and enhanced.

continued

Recent information and/or decisions on mixed waste processing

- Mixed Waste Processing may not be able to produce a marketable Low-Carbon Fuel product if the coal-burning industries are unable or unwilling to adjust their fuel quality requirements, particularly with respect to chlorine concentration.

Costs
In order to process all of its garbage, Peel would need to secure 250,000 tonnes per year of Mixed Waste Processing capacity. Options for securing Mixed Waste Processing capacity are developing a wholly Region-owned facility, partial ownership of a facility developed in partnership with other municipalities or private companies, and procuring capacity at a privately owned facility.

The capital cost of a 250,000 tonnes per year Mixed Waste Processing facility is estimated to be $250 million, excluding land. The cost to operate and maintain the facility and manage output materials, excluding potential revenues from the sale of recyclables, Renewable Natural Gas or Low-Carbon Fuel, is estimated to be in the range of $190 per tonne. All estimated costs are expressed in 2017 dollars.

[Extracts from]
CITY OF EDMONTON COUNCIL
MINUTES

March 20, 2018 – Council Chamber

Waste Management Strategy Update

3. That Administration proceed with initial planning for a source-separated organics program for organic waste processing and collection, with planned implementation starting in Fall 2020 for the units receiving curbside collection.

Using limited cost information on mixed waste processing followed by either composting or anaerobic digestion, very preliminary estimates for London suggest the following:

- Capital costs for a 100,000 tonnes per year facility will be between $50 and $100 million (depending on what facilities would be new versus existing facilities); and

- Net operating costs, assuming reasonable revenues from recyclables, production of renewable natural gas and the sale of SRF, would be between $100 and $150 per tonne.

City are recommending that a curbside Green Bin is the best direction for London. More evidence is required on mixed waste processing in Ontario before the uncertainty around the technical and regulatory risks can be removed. For all the recent progress made in the field of mixed waste processing, there are as many if not more examples that highlight the challenges of this approach. For these reasons, City staff is recommending to proceed with a mixed waste processing pilot project in the multi-residential sector and continued monitoring of ongoing work in a few Ontario municipalities (e.g., Region of Peel, City of Toronto, Region of Durham, County of Oxford).

Previous cost estimates for a Green Bin program include: initial capital of $12 million and on-going annual operating costs of $3.9 million. These estimates are based on a weekly collection of organics comprised of food waste and tissues/paper towelling (diapers/ sanitary products would not be included) and bi-weekly collection of garbage. It is estimated that 13,000 to 15,000 tonnes of organics would be collected per year. Almost all the material collected would be diverted.

A Green Bin program that includes pet waste and sanitary products is expected to collect 18,000 to 22,000 tonnes of material. Some of the material collected would not be diverted (e.g., plastic bags containing pet waste, portion of diapers). A preliminary estimate of costs of this type of program is approximately $5 million annually.

It is expected that the cost of mixed waste processing may decrease in the future because of improved technology and potential revenues from producing renewable natural gas from the organics.

In the future a mixed waste processing program may be preferred if the technical and regulatory risks are addressed. For this reason, it is recommended that the City's Green Bin program be designed to offer flexibility to transition to a mixed waste processing program in the future.

Flexibility can be achieved by the City:

- not building its own processing facility for the organics from the Green Bin Program or entering into a long term contract (e.g., ten or more years) for processing capacity; and,

- having the processing contract(s) match the expected service life of the trucks (about seven years).

Garbage Collection Frequency

Nine of the 13 largest Ontario municipalities with a Green Bin program have transitioned to bi-weekly garbage collection (Table 13), and at least two of the other programs are reviewing the option to go to bi-weekly collection. Municipalities have found that the amount of organic material collected increases by 50% to 100% with the introduction of bi-weekly garbage collection. Collection of Blue Box recyclables also increases with the introduction of bi-weekly garbage collection.

It is recommended that London switch to bi-weekly, same day garbage collection and weekly recycling collection with the introduction of source separated organics collection.

Table 13 - Garbage Collection Frequency for Large Municipalities with Green Bin Collection

Frequency of Garage Collection	Municipalities
Weekly	Hamilton[1], Niagara[1], Simcoe County, Kingston
Bi-weekly	Durham, Halton, Ottawa, Toronto, Peel, Waterloo, York, Guelph, Barrie

[1] Reviewing bi-weekly

Implementation Plan

If the City proceeds with a Green Bin program, an implementation plan will be developed to refine cost estimates, determine operational requirements and finalize an implementation schedule. Decisions on operational requirements are presented in Table 14.

Table 14 - Green Bin Operational Decisions

Operational Decisions	Options
What is collected?	• Commonly collected organics (food waste and tissues/paper toweling) • Yard waste (none or top up cart) • Other organics (pet waste and sanitary products)
How it is collected?	• Co-collected with garbage • Separate collection vehicles (e.g., one person side loaders)
Who processes material?	• Private facility (e.g., Orgaworld) • Pre-process at Waste Management Resource Recovery Area and ship to anaerobic digester (e.g., StormFisher) • Build City facility operated by the private sector
Bin size	• Small (35 to 45 litre) • Medium (50 to 60 litre) • Large (greater than 60 litre); will require semi-automatic or automatic collection
Liners/bags	• Paper (paper bags, paper towels, newspaper) • Compostable plastics • Plastics (typically only allowed if collecting pet waste and/or sanitary products)

The draft implementation schedule for a curbside Green Bin Program is identified on Table 15.

Table 15 - Draft Green Bin Implementation Schedule

Date	Task
January 2019	Finalize Operational Details
February 2019	Finalize Costs and Approval of Authorization to Spend Funds from Approved Capital Budget
Spring 2019	Request for Proposals (RFP) for Processing of Green Bin Materials
Winter 2019/2020	Award Processing Contract Release Request for Tenders (RFT) for new Waste Collection Vehicles
Spring 2020	Award Collection Vehicle Contract Release RFT for Supply and Delivery of Green Bins
Fall 2020	Award Green Bin Supply Contract
Spring/Summer 2021	Start of Major Promotion and Awareness Program Distribution of Green Bins
Fall 2021	Begin Roll-out of Program

4.4 MULTI-RESIDENTIAL ORGANICS MANAGEMENT PROGRAM

Summary - Proposed Actions, Diversion and Costs

The proposed organics collection program for multi-residential homes is a:

- Mixed waste processing pilot on a portion of the waste from multi-residential homes

It is estimated that the proposed program will increase London's diversion rate by approximately 0.5% to 0.7% and have an annual operating cost $0.4 to $0.7 million. The learnings from the pilot project will help the City in future decisions about whether or not to implement a full scale mixed waste processing program in multi-residential buildings and/or curbside homes.

Background

Municipal Program versus Individual Building Programs

The provincial Food and Organic Waste Policy Statement requires individual multi-residential buildings and not the municipality to provide an organics management program by 2025. This requirement is similar to the requirement for multi-residential buildings not the municipality to provide a Blue Box program.

Most municipalities, including London, do provide Blue Box programs for multi-residential buildings because of the improved service and lower programs costs that are possible through “economies of scale” and having a consistent service for all citizens in the municipality. Some larger municipalities in Ontario already provide an organics management program to multi-residential buildings and are expected to continue to do so in the future.

Considering the above, it is recommended that the City provide an organics management program for multi-residential buildings.

Comparison

Just as in the curbside program, a Green Bin program is less expensive and offers less technical and regulatory risk where as a mixed waste processing program offers more convenience to residents and will capture more organics.

A multi-residential Green Bin program is much less effective in terms on increasing waste diversion, than a comparable curbside Green Bin program, (see Table 16). For this reason it is not recommended to proceed with a multi-residential Green Bin program.

Table 16 - Comparison of Typical Curbside and Multi-Residential Green Bin Programs

Consideration		Curbside	Multi-Residential
Capture Rate		50% to 60%	20% to 25%
Cost per Tonne Diverted		$250 to $350	$500 to $600
Contamination Levels	Commonly Collected Organics	2% to 5%	5% to 15%
	All Organics	5% to 15%	15% to 25%

A multi-residential mixed waste processing program is preferred but for all the recent progress made in the field of mixed waste processing, there are as many if not more examples that highlight the challenges of this approach. This is why it is recommended to proceed with a small scale one to two year pilot project in the multi-residential sector and

to continue to monitor work being undertaken in a few key Ontario municipalities (e.g., Region of Peel, City of Toronto, Region of Durham, County of Oxford).

The pilot project will allow to the City to confirm operational requirements, determine technical constraints and consult with the MOECP about regulatory requirements. The learnings from the pilot project will help City in future decisions about whether or not to implement a full scale mixed waste processing program in multi-residential buildings and/or curbside homes.

Preliminary details for a mixed waste processing pilot are presented below:

- include both low-rise and high-rise buildings;
- process approximately 15% of multi-residential waste (60 tonnes waste per week);
- cost approximately $500,000 per year (between $330 and $550 per tonne diverted); and
- divert between 900 tonnes per year (30%) and 1,500 tonnes per year (50%) of the waste to beneficial uses

4.5 OTHER NEW ORGANICS MANAGEMENT PROGRAMS

Summary - Proposed Actions, Diversion and Costs

The following additional organics management programs are proposed:

- Food Waste Avoidance – Develop a food waste avoidance strategy;
- Home Composting - Reduce the cost of composters at the EnviroDepots and undertake additional sale events at select community locations; and
- Community Composting – Provide financial support to community groups or environmental organizations that want to set up a community composting program.

It is estimated that approximately 0.3% to 0.6% of residential waste will be diverted by the above measures and cost $200,000 to $300,000 per year.

Background

Food Waste Avoidance

On average London households throw out 105 kilograms per year of avoidable food waste (i.e., food that at one point could have been eaten). The monetary value of this wasted food is estimated to be between $450 to $600 per household annually which is worth between $60 to $100 million city-wide, per year. This food waste also represents a considerable part of our household carbon food print not to mention lost nutrition. Food waste avoidance entails better management of the food that we buy so that less of it ends up in the garbage. In short, this means optimizing household food planning, purchase, storage, preparation and serving of food.

The City in conjunction with Western University, PhD Candidate Paul van der Werf and 2cg Consulting piloted two outreach projects for reducing the amount of avoidable food waste thrown into the garbage.

Pilot Project #1 focused on reminding people of the annual value of household food waste using a ‘Reduce Food Waste, Save Money’ campaign. Homeowners were provided with a package of information including a fridge magnet with tips and over the pilot project study period were sent a series of email messages reinforcing the saving money theme, each highlighting a unique food waste reduction tip and directing households to the www.foodwaste,ca website for more detailed information.

Pilot Project #2 provided households with a range of containers they could use to manage their food. The kit included plastic containers, mason jars, and Ziploc bags. This included a fridge magnet with food saving tips, a grocery list note pad and freezer bag stickers. These households also had access to the www.foodwaste,ca website.

The lower cost program, Pilot Project #1, was determined to be more effective in reducing the amount of avoidable food waste thrown into the garbage.

Based on research, local data in London, community feedback and survey data, it is recommended that the City:

- develop a food waste avoidance program in 2019 based on a 'Avoid Food Waste, Save Money' campaign

For planning purposes it is estimated that a food waste avoidance program will result in a 10% reduction in food waste in 10% to 30% of London households and will cost $150,000 to $200,000 per year. This would divert 200 to 600 tonnes of food scraps and save residents $900,000 to $2,700,000.

It is noted that the food waste reduction program has the potential to reduce significantly more food waste. This would result in additional savings for residents and increased greenhouse gas reductions but have a smaller impact on increased diversion as it is expected that the food waste going to the Green Bin would decrease as food waste avoidance increased. This would however reduce the cost of the Green Bin program.

Home Composting

Home (or "backyard") composting has played an important role in waste reduction in London since the mid-1990s. Between 1995 and 1999 the city of London participated in a provincial grant program to provide subsidized home composters to residents. Through this program, the City sold approximately 53,000 subsidized composters. Since 2007 the City has sold composters at cost from the EnviroDepots. The units are sold for $35 and approximately 400 to 800 units per year are sold. Home composting is promoted on the City's website and through information flyers.

Two pilot projects were undertaken in 2013 to learn more about the potential to increase waste diversion by increasing home composting. The pilot projects tested strategies to increase the uptake of home composting units by residents. One pilot project in Northridge involved door-to-door sales of composters at a subsidized rate ($10 per composter). The other pilot project in Old South included the pre-order and pick up at a local community school and a higher price for the composters ($20 per composter).

It is estimated that home composting currently diverts between 5,000 and 6,000 tonnes of material annually and approximately 40% to 50% of households do some composting.

Initial estimates suggest that an additional 500 to 1,500 tonnes per year of food scraps could be diverted (up to 1% increase in overall diversion) with an aggressive home composting program modeled on the Northridge pilot project. It is estimated that it would take 3 years to canvass the City and cost approximately $400,000 to $500,000.
Similarly, initial estimates suggest that less than 500 additional tonnes would be diverted (less than 0.5% increase in overall diversion) with a home composting program modeled on a local community pick up location. It is estimated this program would cost approximately $40,000 to $100,000.

It may be possible to increase home composting by reducing the cost of the home composter at the EnviroDepots to $20, $10 or free and doing additional promotion and outreach. Reducing the cost of composters to $20 per unit would cost $10,000 to $50,000 per year. Reducing the cost of composters to $10 would cost $20,000 to $100,000 per year. It is expected that reducing the cost of composters would result in less than 500 additional tonnes being diverted (less than 0.5% increase in overall diversion).

It is recommended that the City:

- reduce the cost of composters at the EnviroDepots from $35 to $20 per unit for one year to determine the impact on up-take of composters and estimated waste diversion; and,

- undertake additional sale events at $10 per unit at several community locations (e.g., community centres) and community events (e.g., Home County Music and Art Festival) for one year to determine the impact on waste diversion.

A decision on whether or not to continue the programs would be made following the first year. For planning purposes it is assumed that the above measures will continue on, result in an annual diversion of 300 tonnes and cost $80,000 to $100,000 per year to operate.

Community Composting

The City could consider composting operations in locations where community members can compost their garden or kitchen waste using large bin composters, small scale in-vessel composters or vermicomposting. Organic waste collection bins could be located at different participating sources, e.g., churches, community gardens, coffee shops, etc. Collected waste would be dropped off to the community composting area. Final compost could be used in community gardens or for local landscaping needs.

The City of Toronto provides funding to FoodShare, a non-profit food security organization that supports Toronto Compost Leaders, a grass roots initiative to build community composting capacity in multi-residential buildings using food waste. No other large municipality in Ontario has a formal community composting program.

Community composting may require provincial approvals depending on the location and where the food waste is coming from.

It is recommended that the City:

- set aside funding for community groups or environmental organizations that want to set up a community composting program; and

- funding would cover 100% of capital costs.

It is suggested that City set aside $10,000 to $20,000 per year to support community composting initiatives. For estimating purposes, it is assumed that 10 community composting sites will be established by 2022 diverting approximately 20 to 40 tonnes per year.

4.6 WASTE REDUCTION AND REUSE INITIATIVES AND POLICIES

Summary - Proposed Actions, Diversion and Costs

The following waste reduction and reuse initiatives and policies are proposed:

- create a Waste Reduction and Reuse Coordinator position within the Solid Waste Management Division;
- $150,000 to 250,000 per year in increased funding be allotted to waste reduction and reuse initiatives;
- reduction of the container limit to 2 or 3 containers per collection when the Green Bin program with bi-weekly garbage collection is implemented;
- further explore the use of clear bags for garbage collection if London does not move to roll-out cart based garbage collection system;
- further explore a full user pay garbage system if London moves to roll-out cart based garbage collection system;

- further examine other incentive and disincentive initiatives (best practices) from other municipalities (e.g., mandatory recycling by-law, reward systems, user fees, etc.); and
- include the calculation of waste reduction in addition to waste diversion when providing waste management progress reports to Council.

In addition to the City measures, it is expected that additional province wide measures as part of their Waste-Free Ontario Strategy will be undertaken and many residents will take additional actions on their own to reduce their waste.

It is estimated that the above measures will cost the City $150,000 to $350,000 per year. For planning purposes, it is estimated all waste reduce and reuse initiatives and policies will divert approximately 1% to 4% of residential waste.

Background

Waste Reduction and Reuse Initiatives

There are numerous initiatives that could be introduced that focus on raising awareness and engaging citizens to make small changes in their daily life to reduce waste and increase reuse of materials. Initiatives include lending libraries, repair workshops, promotion of reuse events and increased waste reduction education and outreach.

As some of the initiatives listed above are already underway in London through other organizations, the City could explore options to build partnerships with these organizations. This could include providing financial support for new waste reduction and reuse programs and initiatives.

The most effective way of increasing diversion through waste reduction and reuse is often by increasing community engagement, education and providing feedback to residents. The impact of any one community engagement or education initiative may not be significant but together these small changes contribute to cultivating a culture of waste reduction and over time could make a significant difference to how we manage resources. To accomplish this, it is proposed to increase funding and staff resources for waste reduction and reuse initiatives.

Waste Reduction Success Story

In 2007, the Ontario government introduced a goal to reduce the number of carry-out plastic bags in the province by 50% by 2012.

A number of initiatives were introduced by industry and municipalities including promotion of reusable bags and bins, improved bagging practices at check-outs, charging for plastic bags.

By 2009 there was a 70% drop in Ontario's per-capita use of plastic bags.

It is hoped the City's initiatives coupled with any provincial and industry initiatives will reduce per capita garbage going to landfill. Currently, overall the diversion rate is reported to council on a regular basis. The diversion rates for specific programs are also provided to Council as required. It is not possible to measure the reduction/reuse achieved by individual initiatives but is possible to calculate

the overall change in per capita waste generation from year to year. Including this measure in future reports to Council will allow us to track progress being made in waste reduction and reuse and highlight their importance.

Summary

It is recommended that the City:

- create a Waste Reduction and Reuse Coordinator position within the Solid Waste Management Division;
- $150,000 per year in increased funding be allotted to waste reduction and reuse initiatives; and
- the City include the calculation of waste reduction in addition to waste diversion when providing waste management progress reports to Council.

Waste Reduction and Reuse Policies

Although there are high levels of resident participation in City diversion programs, participation is voluntary, and does not require residents to first minimize the quantity of waste being generated in the home. There are a number of "behaviour change initiatives" that could be undertaken to encourage both waste reduction (i.e., not produced in the first place) and waste diversion of recyclables and compostables. As waste diversion programs mature and all practical programs have been implemented, behaviour change initiatives become the key tools remaining to increase diversion.

Some of these programs are not costly to implement and may generate revenue (e.g., user pay for garbage) or reduce costs (e.g., lower container limits). Other programs would require support by businesses and residents, and could range from tougher enforcement of waste by-laws (e.g., garbage container and weight limits) to City policies and by-laws that would impact how business is conducted and consumers must abide by (e.g., restricting/banning certain business transactions). Some residents and businesses may see these programs as inconvenient or "going too far".

Below are some common behaviour change/adjustment initiatives that may have a role in London in the future. Most of these initiatives will require a change to current Council policies and practices and be implemented through a by-law.

Bag Limits

Reducing the container limit encourages participation in the various waste diversion programs as well as reducing garbage generation.

The City of London currently has a 3 Container Limit (included in taxes) for garbage collection for single family households. The City’s container limit takes into consideration the longer cycle times between collections which varies from 8 to 12 days throughout the year. This is equivalent to 1.8 containers per week for a 12 day cycle to 2.6 containers per week for an 8 day cycle with an average of 2.4 containers per week over the entire year.

Most large Ontario municipalities with a source separated organics program have a garbage container limit equivalent to one or two containers per week. It is recommended that the City implement a 2 or 3 Container Limit per collection if the City implements a source separated organics collection program with bi-weekly garbage collection.

Residents will still have the option of paying to dispose of extra garbage at the curb or the EnviroDepots.

Clear Bags

Some municipalities have residents use clear bags so that recyclables or compostables could be easily spotted in the garbage. This is more common in the Maritimes but the City of Markham has had a clear bag program for five years and credits this program for a significant reduction in the amount of garbage and an increase in recycling and composting. London is currently looking at garbage collection options including collection of garbage in roll-out carts. A clear bag program is not compatible with a roll-out cart program for garbage collection.

London should further explore the use of clear bags for garbage collection if London does not move to a roll-out cart based garbage collection system.

User Pay

Some smaller municipalities have gone to full user pay systems where residents pay for every container of garbage placed to the curb. Full user pay systems encourage participation in the various waste diversion programs as well as reducing one's garbage generation.

A full user pay system is typically not practical in larger municipalities unless the municipality has a cart based garbage collection system. In Toronto, residents pay an annual fee ranging from $255 to $487 per year per household depending on the size of cart they select.

A full user pay garbage system should be explored further if London moves to roll-out cart based garbage collection system.

Other Incentive and Disincentive Programs

The vast majority of Londoners participate in various diversion programs although there are those that refuse to participate in these voluntary programs. There are various incentive and disincentive programs that will encourage greater participation.

For example, the City could explore developing a mandatory by-law for the diversion of materials for which there are recycling or composting programs. Enforcement of the by-law may require additional staff. Mandatory diversion by-laws usually work best in conjunction with a clear garbage bag program.

Alternatively, some municipalities ban recyclables or other materials from garbage collection. The City currently has banned a number of materials from garbage collection including renovation materials, grass clippings, blue box recyclables, scrap metal, electronics, tires and yard materials. These materials were banned because reasonably convenient recycling options exist. As new programs are developed, consideration could be given to banning materials accepted by these programs.

There are incentive programs that the City could consider to encourage greater program participation like the Gold Box program in Hamilton or Recycle Bank (rewards program) in the United States.

Summary
It is recommended:

- reduction of the container limit to 2 or 3 containers per collection when the Green Bin program with bi-weekly garbage collection is operational;
- further explore the use of clear bags for garbage collection if London does not move to a roll-out cart based garbage collection system;
- further explore a full user pay garbage system if London moves to roll-out cart based garbage collection system; and
- further examine other incentive and disincentive initiatives (best practices) from other municipalities (e.g., mandatory recycling by-law, reward systems, etc.).

4.7 Environmental, Social and Cost Summary

In summary, this report proposes the set of actions identified on Table 17 to achieve 60% waste diversion. By taking these actions, the City and Londoners receive a number of environmental social and financial benefits which are listed below.

Environmental Benefits

1. *Increased Waste Diversion*
   The Province's *Strategy for a Waste-Free Ontario: Building the Circular Economy* in February 2017 identifies to two key aspirational long term environmental goals. One of these environmental goals is zero waste. Going from 45% to 60% waste diversion is a significant step towards this goal.

2. *Reduced GHG*
   The other key aspirational long term environmental goal identified by the Province is zero GHG emissions from the waste sector. The measures in this Action Plan will reduce GHG emissions by 17,000 to 27,000 tonnes annually. This is equivalent to removing 4,200 to 6,800 cars from the road.

Table 17 - Proposed Actions to Achieve 60% Residential Waste Diversion

Blue Box (Blue Cart) Programs
1. Increase capture of recyclables from 63% to 75% (less placed in the garbage)
New (or Expanded) Recycling Programs and Initiatives
2. Bulky Plastics a) Continue with existing pilot project b) Consider implementation of an expanded program once long term stable markets have developed 3. Carpets a) Wait to see if the Province develops a provincial program for carpets under the *Waste-Free Ontario Act* as there are limited markets for recycling carpets in the province b) If no provincial program exists by 2021, implement a pilot project 4. Ceramics a) Provide a drop-off location for ceramics at no cost at the City's EnviroDepots b) Ban collection of toilets at the curb 5. Clothing and Textiles a) develop a textile awareness strategy to promote existing reuse opportunities b) pilot depot collection at select multi-residential buildings 6. Small Metal (Small Appliances/Electrical Tools/Scrap Metal) a) implement semi-annual curbside collection of small metal items b) pilot depot collection at select multi-residential buildings 7. Furniture a) Begin semi-annual collection of wooden furniture b) Provide a drop-off location at W12A EnviroDepot for wooden furniture c) Ban wooden furniture from curbside garbage collection 8. Mattresses a) Wait to see if the Province develops a provincial program for mattresses under the *Waste-Free Ontario Act* as there are limited markets for recycling mattresses in the province b) If no provincial program exists by 2021, implement a pilot project
Curbside Organics Management Program
9. Implement a curbside Green Bin program 10. Implement bi-weekly garbage collection
Multi-Residential Organics Management Program
11. Implement a mixed waste processing pilot (to recover organics and other materials) on a portion of the waste from multi-residential homes

Table continues

Table 17 - Proposed Actions to Achieve 60% Residential Waste Diversion

Other New Organics Management Programs
12. Develop and implement a food waste avoidance strategy 13. Reduce the cost of composters at the EnviroDepots and undertake additional sale events at select community locations 14. Provide financial support to community groups or environmental organizations that want to set up a community composting program
Waste Reduction and Reuse Initiatives and Policies
15. Create a Waste Reduction and Reuse Coordinator position within the Solid Waste Management Division 16. Provide financial support for community waste reduction and reuse initiatives 17. Reduce the container limit to two or three containers per collection when the Green Bin program with bi-weekly garbage collection is operational 18. Further explore the use of clear bags for garbage collection if London does not move to a roll-out cart based garbage collection system 19. Further explore a full user pay garbage system if London moves to a roll-out cart based garbage collection system 20. Further examine other incentive and disincentive initiatives (best practices) from other municipalities (e.g., mandatory recycling by-law, reward systems, user fees, etc.) 21. Provide additional feedback approaches to residents (including how waste reduction and waste diversion are calculated when providing waste management progress reports)

3. *Reduced Landfill Impacts*
   Reducing the amount of waste going to the W12A Landfill will reduce nuisance impacts such as traffic, litter, vermin, noise and odours; and the amount of additional land and/or height of the proposed expansion of the W12A Landfill.

4. *Better Use of Material and Resources*
   Materials diverted will be turned into useful products instead of being landfilled. For example, if organics from a Green Bin program were composted, it would result in the production of approximately 350,000 to 500,000 bags of compost with a market value of $700,000 to $1,100,000. If the organics were anaerobically digested, it would result enough biogas to generate 1 to 1.5 million m^3 of renewable natural gas.

Social Benefits

5. *Creation of Jobs*
   Studies have also shown that Ontario's existing waste diversion programs can create up to 10 times more jobs than waste disposal. The MOECP estimates that for every 1,000 tonnes of waste diverted in Ontario, seven jobs are created through the existing waste diversion programs. California's Department of Resources, Recycling and Recovery estimates that up to 5 jobs every 1,000 tonnes of waste diverted. These

"rules of thumb" suggest that approximately between 125 and 170 jobs will be created (direct and indirect; within and outside London).

6. *Social Satisfaction*
   Undertaking the proposed actions in this plan, will allow many residents to feel additional satisfaction or pride living in an environmentally progressive city.

Financial Benefits

7. *Short-term Landfill Savings*
   Reducing the quantity of waste to the landfill reduces the capital and operating cost of the landfill.

   The average capital and operating cost for the W12A Landfill is estimated to be approximately $30 to $40 per tonne. Some of these costs are variable costs that vary directly with the quantity of waste going to the landfill. In other words, the cost goes up the same amount for every additional tonne of waste going to the landfill. An example of this would be leachate collection system costs.

   Some of the costs are fixed costs and do not change with the quantity of waste going to the landfill. An example of this would be groundwater monitoring costs.

   It is estimated that the average landfill savings for each tonne of waste diverted from the landfill after accounting for fixed costs and variable costs is approximately $15 to $20 per tonne.

   The annual landfill savings is projected to be approximately $360,000 to $480,000 per year. The majority of these savings would be in capital costs (about 75%) which could be used to reduce the annual contribution from general taxes required for the Sanitary Landfill Reserve Fund. City staff are recommending that W12A Landfill costs and savings be handled separately as more details become known through the environmental assessment process and current and future capital cost impacts associated with landfill operations.

8. *Avoid Increase in Long Term Disposal Costs*
   The existing landfill has less than 11 years of capacity remaining and it is expected that approval of any expansion of the landfill by the MOECP would be unlikely unless the City has programs in place to achieve 60% waste diversion.

   The increase in waste disposal costs will be significant if the City must export its waste to a private landfill elsewhere in Ontario. The increase in disposal costs for the City to export its waste is estimated to be approximately $5 to $7 million per year.

Cost Summary

The approximate cost, expected diversion and timeline for implementation for the actions listed in Table 17 are summarized in Table 18. The cost to implement the 60% Waste Diversion Action Plan is estimated to range from $5.05 to $7.45 million with the most likely cost being $6.5 million.

Table 18 - Summary of Diversion, Estimated Operating Costs and Schedule

Program Category	Diversion Rate		Annual Estimated Operating Cost			Schedule
	Range	Likely	Range	Likely	$/Hhld[a]	
Blue Box Recycling Improvements	1% - 3%	2%	$0	$0	$0	Likely not under City control[b] in the future
New Recycling Programs and Initiatives	0.4% - 0.8%	0.6%	$350,000 - $550,000	$450,000	$2.00 - $3.00	2019[c] - 2021
Curbside Organics Management Program	8% - 12%	10%	$3,900,000 - $5,500,000	$5,000,000	$21.75 - $30.50	2020 - 2022
Multi-Residential Organics Management Pilot Program	0.5% - 0.7%	0.6%	$400,000 - $700,000	$500,000	$2.25 - 4.00	2020
Other Organic Management Programs	0.3%- 0.6%	0.4%	$250,000 - $350,000	$300,000	$1.50 - $2.00	2019[c] - 2021
Waste Reduction, Reuse Initiatives and Policies	1% - 4%	1.4%	$150,000 - $250,000	$150,000	$0.50 - $2.00	2019[c] - 2021
Total[c]	**11% - 21%**	**15%**	**$5,050,000 - $7,450,000**	**$6,500,000 ($36.00)**	**$28.00 - $41.50**	**2019[c] - 2022**

Notes:

a) Based on 180,000 households.
b) The provincial Waste-Free Ontario Strategy calls for a transition from the current Blue Box program, which is municipally managed and co-funded by industry and municipalities, toward a full EPR program by 2023. The EPR program will require producers to take full financial and operational responsibility for all Ontario municipal Blue Box programs.
c) 2019 Multi-year budget has $140,000 assigned to new waste diversion initiatives.
d) Totals may not add due to rounding.

Table 19 provides a comparison of waste management system costs for London and other municipalities that are part of the Municipal Benchmarking Network Canada initiative. The table also highlights London's expected costs after implementation of the 60% Diversion Action Plan.

Table 19 – 2016 Municipal Waste Management Costs[a]

Municipality	Cost per Tonne		Cost per Household		
	Collection & Disposal	Diversion	Collection & Disposal	Diversion	Total
Calgary	216	346	150	89	239
Durham	324	205	127	106	232
Halton	248	201	97	106	203
Hamilton	344	151	150	69	218
Montreal	230	249	129	82	211
Niagara	195	138	90	102	192
Regina[b]	150	331	150	59	209
Sudbury (Greater)	349	181	168	92	260
Toronto	240	442	90	158	248
Waterloo	226	195	142	94	236
Windsor[b]	204	123	118	45	163
Winnipeg[b]	107	260	83	82	165
Average	236	235	124	90	215
London (existing programs)[b]	121	123	89	50	139
London (60% - likely cost)[c]	156	161	87	86	173
London (60% - high cost)[d]	156	171	87	91	178

Notes

a) From Municipal Benchmarking Network Canada. Includes all costs including amortization, landfill liability costs and municipal overhead. Includes Blue Box recycling revenue but excludes all other revenue (e.g., landfill tipping fees, WDO funding, waste collection fees, EnviroDepot fees, etc.).
b) No Green Bin program.
c) City of London current program cost with Likely Cost from the 60% Waste Diversion Action Plan (Table 18).
d) City of London current program cost using the High end of the Range from the 60% Waste Diversion Action Plan (Table 18).

Table 19 shows that if London implemented all parts of the 60% Waste Diversion Action Plan using the Likely costs estimate of $6.5 million it would have the 3rd lowest overall waste system cost on a per household basis and lowest cost among municipalities that have a Green Bin program. It would also be one of the few municipalities to reach 60% waste diversion.

Using the High end of the Range ($7.25 million) from the 60% Waste Diversion Action Plan (Table 18) London would still have the 3rd lowest overall waste system cost on a per household basis and lowest cost among municipalities that have a Green Bin program.

Funding 60% Waste Diversion

Potential funding sources to lower the annual cost of $5.05 to $7.45 million by $1.8 to $3 million per year are highlighted below.

Operating Costs

As shown in Table 18, annual operating costs for the 60% waste diversion action plan will range from $5.05 million to $7.45 million and will depend on final program design, market competition, etc. The most likely annual operating cost is estimated to be $6.5 million.

City staff continue to examine a number of financing approaches. The change in government in Ontario has created additional uncertainty as a number of potential revenues sources for waste diversion are on hold. Besides taxes, potential sources of revenue currently include:

- Additional recycling program costs paid by industry - potential cost savings from expected transition from the current Blue Box program, which is municipally managed and co-funded by industry and municipalities, toward a full EPR program paid 100% by industry by 2023. This is expected to reduce the City's current waste diversion program costs by $1.5 to $1.8 million. In addition there is the potential of one time capital funding for recycling infrastructure.

- Other extended producer responsibility revenues - for items such as branded organics (e.g., diapers, soiled paper, tissues/toweling) carpets, textiles, furniture and other consumer goods. This sources could range between $50,000 and $150,000 per year.

- W12A Landfill levy to support diversion - a specific amount charged on every tonne of garbage that is placed in dedicated fund for waste reduction and waste diversion. The amount that could be collected is based on many factors (e.g., which garbage is it applied to, what fee, etc.). Levies between $2 and $20 per tonne are noted in some jurisdictions. This source could range between $250,000 and $1 million per year.

- Greenhouse gas offset credits associated with organics diversion - The Government of Ontario was working on introducing an emissions offset protocol for aerobic composting into Ontario's Cap & Trade program, based on an existing protocol used in Alberta (e.g., five composting projects currently listed on the Alberta Emissions Offset Registry). The

value of these offsets would have been between $100,000 and $500,000 per year based on an assumed value of around $20 per tonne of GHG emissions offset (and increasing over time). It is unclear at this time how/if this funding opportunity will be replaced.

A summary of estimated operating costs and potential annual funding is identified on Table 20.

Table 20 – Summary of Estimated Costs and Potential Funding

	Low	High	Likely (Anticipated)
Costs (Table 18)	$5,050,000	$7,450,000	$6,500,000
Revenues	$1,800,000	$2,950,000	$2,000,000
Total Estimated Costs			$4,500,000

Capital

Capital costs for the 60% Waste Diversion Action Plan will depend on program design, technology considerations, etc. The largest capital expenditure will be for the Green Bin Program. A capital cost of $12 million for the Green Bin program had previously been estimated (January 2016, Multi-year Budget deliberations). Other waste diversion initiatives listed in the Action Plan may require new investment in the order of $500,000 to $3 million for a total of $12.5 to $15 million in capital expenditures.

It is expected that capital costs for the 60% Waste Diversion Action Plan will be able to be funded from the existing capital budget. The current ten-year capital program includes $35 million in 2020 for new solid waste diversion technologies to increase diversion. After allocating up to $15 million for the Action Plan, there would be $20 million left for advanced waste diversion and/or resource recovery technologies.

5) RESOURCE RECOVERY STRATEGY

As referred to in this Action Plan, the City of London has three major projects underway:

1. The Resource Recovery Strategy involves the development of a plan to maximize waste reduction, reuse, recycling, resource recovery, energy recovery and/or waste conversion in an economically viable and environmentally responsible manner. Resource Recovery strategies (i.e., often known as waste diversion strategies) are developed and approved at the local government level and do not require Provincial government approval. This is the focus of this chapter.

2. The 60% Waste Diversion Action Plan, the purpose of this overall report, is both a standalone plan and part of the larger Resource Recovery Strategy. It essentially covers the period from 2018, through implementation and measurement in 2023 (when all projects and initiatives are in place as per current timelines).

3. The Residual Waste Disposal Strategy involves the development of a long-term plan to manage residual waste (waste after resource recovery) and involves completion of an Individual Environmental Assessment (EA) as prescribed by the Ministry of the Environment & Climate Change (MOECC). The Individual EA requires approval by the Minister of Environment & Climate Change and Cabinet.

Traditional Waste Diversion and Waste Management Technologies and Practices

Generally, in Ontario, waste management systems include variations on the following practices to reach higher levels of waste diversion:

- Waste avoidance/prevention/minimization (not created in the first place)
- Reuse/refurbish/repurpose (for use again)
- Source separated recyclables (to be collected, processed, marketed and re-manufactured)
- Source separated leaf and yard waste (to be collected, processed and marketed)
- Source separated organics (food and other organics wastes) (to be collected, processed and marketed). Processing technologies generally include aerobic composting and anaerobic digestion (AD) technologies
- Energy from waste (EFW) through combustion
- Landfill

To go beyond 60% waste diversion will require the use of more advanced waste diversion and resource recovery technologies and practices. The purpose of this chapter is to provide a brief update on:

- Definitions and Terminology
- Overview of Steps to Develop a Resource Recovery Strategy for London
- Current Timetable for Resource Recovery Strategy

5.1 DEFINITIONS AND TERMINOLOGY

The field of solid waste management has a plethora of definitions that fall into different categories including:

- Regulatory definitions usually defined by the Province of Ontario although some are defined at the Federal Government;
- By-law definitions usually defined by municipalities (and not always consistent from one municipality to the next); and
- Definitions created by waste management, recycling and other related organizations that have no legal foundation; however, they are often used by the members and adopted by others.

Some definitions often have a historical basis and have not been modernized; although the technologies within the definition are different than in the past. The inconsistency in legal definitions can be problematic when different provinces are compared. In addition, different technologies can be lumped together in some definitions with little understanding as to why that is the case. The remainder of this section highlights a number of terms and some different definitions.

Resource Recovery and Resource Recovery System

"Resource recovery means the extraction of useful materials or other resources from things that might otherwise be waste, including through reuse, recycling, reintegration, regeneration or other activities. This includes the collection, handling, and processing of food and organic waste for beneficial uses. Although energy from waste and alternative fuels are permitted as waste management options, these methods are not considered resource recovery. The recovery of nutrients, such as digestate from anaerobic digestion, is considered resource recovery.

Resource recovery system means any part of a waste management system that collects, handles, transports, stores or processes waste for resource recovery purposes, but does not include disposal."

* source – Ministry of the Environment & Climate Change, Food and Organic Waste Policy Statement, April 2018, https://www.ontario.ca/page/food-and-organic-waste-framework

Integrated Solid Waste Management

"Integrated Solid Waste Management (ISWM) is a comprehensive waste prevention, recycling, composting, and disposal program which works cohesively to prevent, recycle, and manage solid waste in ways that most effectively protect human health and the environment. ISWM considers local needs and conditions, and then applies the most appropriate combination of waste management approaches for that situation. The major components of ISWM activities are waste prevention, recycling and composting, resource recovery, and, disposal in properly designed, constructed, and managed landfills."

* source - based on the EPA definition noting that determining a date of this definition is difficult because many current documents are now archived on the USEPA website.
* Environment Canada and the Ministry of the Environment & Climate Change do not have specific definitions; however, many municipalities in Ontario and across Canada have created definitions to meet their needs.

Advanced Resource Recovery Technologies and Practices
Generally, advanced resource recovery technologies and practices fall under one of these categories:

- Anaerobic Digestion (AD - Biogas)
- Mixed Waste Processing (MWP)
- Mechanical/Biological Treatment (MBT)
- Waste Conversion Technologies (WCT)
- Energy from Waste (EFW)

The literature does not contain consistent definitions for these technologies and sometimes groups of technologies may be classified under a single heading.

Anaerobic Digestion (AD - Biogas)
AD facilities can be listed under both traditional (as noted above because it is a proven technology in Ontario) and advanced in the case of Ontario as most AD experience has been associated with farm operations. With respect to AD as part of Mechanical-Biological Treatment (MBT) or as part of a mixed waste processing (MWP) system, this would be considered advanced and belongs in this section.

"Anaerobic digestion means the decomposition of organic matter by bacteria in an oxygen-limiting environment (as defined in Regulation 347 under the Environmental Protection Act). The biogas generated through anaerobic digestion can be used to fuel electrical generators, or it can be further processed into renewable natural gas. The digestate may also be used as a soil amendment that is most commonly used in agricultural operations."

* source – Ministry of the Environment & Climate Change, Food and Organic Waste Policy Statement, April 2018, https://www.ontario.ca/page/food-and-organic-waste-framework

"What is Biogas? Biogas is a renewable source of methane, the main ingredient in natural gas. It can be used for heating and cooling, or to generate electricity that can be used on-site or fed into the distribution grid. It can be refined into renewable natural gas that can be injected into gas pipelines or compressed and used as a vehicle fuel. The entire system, including the energy generating components, is typically referred to as a biogas facility or a biogas plant.

Biogas is produced when organic materials — anything from municipal organic wastes or bio-solids, food processing by-products, or agricultural manure and crop residues —

break down in an oxygen-free environment. The process is called anaerobic digestion (AD) and usually occurs in a specialized tank or vessel – the anaerobic digester. AD is also the process that generates biogas or landfill gas (LFG) within landfills.

Anaerobic digesters have a number of end products, including digestate, a nutrient-rich slurry that can be applied directly on agricultural land, or material that is composted and then used for a range of purposes. Digester solids are materials from after de-watering that can be composted, and are well suited to be mixed with leaf and yard waste."

*Source - Canadian Biogas Association, Municipal Guide to Biogas, March 2015 https://www.biogasassociation.ca/

Mixed Waste Processing

Mixed-waste processing involves no generator separation of waste, with all waste processed at what's been called a "dirty" material recovery facility (MRF).[1] Recyclables are then pulled out at the MRF through a combination of manual and mechanical sorting. The sorted recyclable materials may undergo further processing required to meet technical specifications established by end-markets while the balance of the mixed waste stream is sent to a disposal facility such as a waste-to-energy facility or landfill".[2]

* source(s)
[1] Waste 360 http://www.waste360.com/mrfs/10-points-explain-mixed-waste-processing
[2] Wikipedia https://en.wikipedia.org/wiki/Materials_recovery_facility

"Mixed waste processing means resource recovery processes that recover food waste or organic waste from waste streams where food and organic waste is co-mingled with other wastes."

* source – Ministry of the Environment & Climate Change, Food and Organic Waste Policy Statement, April 2018, https://www.ontario.ca/page/food-and-organic-waste-framework

Mechanical/Biological Treatment (MBT)

"Mechanical Biological Treatment (MBT) technologies are pre-treatment technologies which contribute to the diversion of MSW from landfill when operated as part of a wider integrated approach involving additional treatment stages. Mechanical Biological Treatment (MBT) is a generic term for an integration of several mechanical processes commonly found in other waste management facilities such as Materials Recovery Facilities (MRFs), composting or Anaerobic Digestion plant. MBT plants can incorporate a number of different processes in a variety of combinations. MBT therefore compliments, but does not replace, other waste management technologies such as recycling and composting as part of an integrated waste management system. MBT plants include the:

- *Pre-treatment of waste going to landfill;*

- *Diversion of non-biodegradable and biodegradable MSW going to landfill through the mechanical sorting of MSW into materials for recycling and/or energy recovery as refuse derived fuel (RDF);*
- *Diversion of biodegradable MSW going to landfill by:*
- *Reducing the dry mass of MSW prior to landfill;*
- *Reducing the biodegradability of MSW prior to landfill;*
- *Stabilization into a compost-like output (CLO) for use on land;*
- *Conversion into a combustible biogas for energy recovery; and/or*
- *Drying materials to produce a high calorific organic rich fraction for use as RDF."*

* source - Mechanical Biological Treatment of Municipal Solid Waste, February 2013, Dept. of Environment, Food and Rural Affairs, www.defra.gov.uk

Waste Conversion Technologies (WCT)
Waste Conversion Technologies (WCT) include the broad range of technologies which are applied to recover the inherent stored resource value of targeted waste feedstocks and/or MSW and to make these resources available for use rather than for disposal.

"There are a large number of technologies on the market at the moment and the use of many terms and definitions, with often different meaning. This reduces the possibility of comparing the different options. This chapter lists the most important concepts used in this field alphabetically.

- *Gasification is the thermal breakdown of waste under oxygen starved conditions (oxygen content in the conversion gas stream is lower than needed for combustion), thus creating a syngas (e.g. the conversion of coal into city gas).*
- *Plasma gasification is the treatment of waste through a very high intensity electron arc, leading to temperatures of > 2,000°C. Within such a plasma, gasifying conditions break the waste down into a vitrified slag and syngas.*
- *Pyrolysis is the thermal breakdown of waste in the absence of air, to produce char, pyrolysis oil and syngas (e.g. the conversion of wood into charcoal)."*

* source - International Solid Waste Association (ISWA), Alternative Waste Conversion Technologies, 2013

"New technologies to convert municipal and other waste streams into fuels and chemical commodities, termed conversion technologies, are rapidly developing. Conversion technologies are garnering increasing interest and demand due primarily to alternative energy initiatives. These technologies have the potential to serve multiple functions, such as diverting waste from landfills, reducing dependence on fossil fuels, and lowering the environmental footprint for waste management. Conversion technologies are particularly difficult to define because their market is in development and many of their design and operational features are not openly communicated by vendors. EPA's Office of Research and Development conducted research to evaluate and develop a "State of Practice" report for State and local decision-makers on the suite of emerging waste conversion technologies."

* source - USEPA State of Practice for Emerging Waste Conversion Technologies, 2012 https://cfpub.epa.gov/si/si_public_record_report.cfm?dirEntryId=305250

Energy-from-Waste (EFW)

EFW is "A facility that generates steam and/or electricity through the combustion of municipal solid waste."

* source – Canadian Resource Recovery Council, http://www.resourcerecovery.ca/info/glossary/

"Energy-from-Waste is any technology, which recovers energy from the management/processing of waste materials. This includes Anaerobic Digestion, Mass Burn, Gasification, Plasma Gasification, and Landfill Gas Recovery.

Waste Derived Fuel is any technology designed to turn waste materials into a fuel product with the recovery of recyclables materials as part of the fuel development process."

* source – Ontario Waste Management Association, Guiding Principles Integrated Solid Waste Resource Recovery and Utilization (OWMA EFW/WDF Committee, November 2011) https://www.owma.org/articles/guiding-principles-on-integrated-solid-waste-recovery-and-utilization

Energy can be recovered from waste by various (very different) technologies. It is important that recyclable material is removed first, and that energy is recovered from what remains, i.e. from the residual waste. Energy from waste (EFW) technologies include:

- *Combustion in which the residual waste burns at 850°C and the energy is recovered as electricity or heat*
- *Gasification and pyrolysis, where the fuel is heated with little or no oxygen to produce "syngas" which can be used to generate energy or as a feedstock for producing methane, chemicals, biofuels, or hydrogen (see also landfill gas and sewage gas)*
- *Anaerobic digestion, which uses microorganisms to convert organic waste into a methane-rich biogas that can be combusted to generate electricity and heat or converted to biomethane. This technology is most suitable for wet organic wastes or food waste. The other output is a biofertilizer.*

* source – Renewable Energy Association, United Kingdom https://www.r-e-a.net/renewable-technologies/energy-from-waste

Energy recovery from waste is the conversion of non-recyclable waste materials into usable heat, electricity, or fuel through a variety of processes, including combustion, gasification, pyrolization, anaerobic digestion and landfill gas recovery. This process is often called waste to energy (WTE).

* source - US EPA website, no date provided https://www.epa.gov/smm/energy-recovery-combustion-municipal-solid-waste-msw

5.2 Overview of Steps to Develop a Resource Recovery Strategy for London

The Resource Recovery Strategy will outline the concepts, requirements, challenges, opportunities and timeframes for increasing waste diversion and resource recovery beyond 60%. Development of the Resource Recovery Strategy, as of June 2018, includes activities in the following areas:

1. Preliminary Review of Advanced Resource Recovery Initiatives and Technologies

Complete:	75%	In Progress:	25%	Not Started:	0%

Preliminary review of initiatives and technologies to develop a long list of advanced resource recovery opportunities that require further investigation. This was undertaken through literature review, Internet search, work completed by the Institute for Chemical and Fuels from Alternative Resources (ICFAR)/Western University and several site visits.

2. Consideration of Regional Resource Recovery Opportunities

Complete:	25%	In Progress:	0%	Not Started:	75%

In 2017, the City canvassed nearby municipalities (Elgin County, Huron County, Lambton County, Middlesex County, Oxford County and Perth County) responsible for waste management to determine their interest in using any future resource recovery facility(ies). All municipalities expressed an interest in being included in discussions about any new resource recovery facilities and indicated they would consider using the facility depending on the cost.

The potential for a regional facility may make it possible to consider technologies that require larger waste quantities in order to be economically feasible.

3. Alignment with Provincial Strategies and Legislation

Complete:	25%	In Progress:	25%	Not Started:	50%

Development of the Resource Recovery Strategy will need to align with the provincial Strategy for a Waste-Free Ontario: Building the Circular Economy as well as the new Food and Organic Waste Framework and additional documents that are forthcoming.

4. Consideration of Learnings from the Mixed Waste Processing Working Group

Complete:	0%	In Progress:	100%	Not Started:	0%

As noted in Section 1.5, formed in early 2017, the Region of Peel is the coordinator of a Mixed Waste Processing Working Group comprised of eight Ontario municipalities representing about half of Ontario's population. The Working Group shares updates,

research results, Committee/Council reports, site visit experience and related operational experiences.

5. Consideration of Learnings from London Waste to Resources Innovation Centre (LWRIC)

Complete:	0%	In Progress:	100%	Not Started:	0%

The primary goals of LWRIC are noted in Section 1.5. The City of London currently has signed Memorandum of Understanding (MoUs) with the following organizations:

- University of Western Ontario (Institute of Chemicals and Fuels from Alternative Resources); approved December 2016 with a current expiry date of December 31, 2019;
- Bio-TechFar Inc; approved June 2017 with a current expiry date of December 31, 2019;
- Hawthorne Green Key Group; approved June 2017 with a current expiry date of June 30, 2020;
- Try Recycling; approved June 2017 with a current expiry date of December 31, 2019;
- Canadian Plastics Industry Association; approved March 2018 with a current expiry date of March 31, 2020; and
- Try Recycling; approved June 2017 with a current expiry date of December 31, 2019;
- Resource Energy Development of Canada Ltd.; approved March 2018 with a current expiry date of March 31, 2021.

One MoU has expired:

- Green Shields Energy; expired December 31, 2017.

The City (LWRIC), Canadian Biogas Association and Union Gas worked together in 2016/2017 to assess the economic feasibility and environmental benefits of producing biogas by anaerobically digesting the organic fraction of the London's residential waste stream, and subsequently converting the biogas to renewable natural gas (RNG) for use in compressed natural gas vehicles. Two scenarios were considered: collecting and anaerobically digesting source separated organic (SSO) materials or anaerobically digesting organic materials separated from a mixed waste stream at a processing facility (facility-separated organics - FSO). This study included sending out a Request for Information (RFI) to anaerobic digestion technology suppliers. Details of this work can be found at:
https://biogasassociation.ca/images/uploads/documents//2017/CBA_London_Report.pdf

6. Request for Information

Complete:	0%	In Progress:	50%	Not Started:	50%

As noted in section 1.5, the City released a Request for Information (RFI) to obtain information about resource recovery (i.e., waste processing) technologies that might be suitable for the City of London to divert waste away from the City's Landfill. As noted in the 60% Waste Diversion Action Plan, it is expected that the 60% diversion could be achieved by a combination of enhanced waste reduction initiatives, increased capture of Blue Box materials, the introduction of recycling of various bulky items and the introduction of an organics management program.

About 50 technology/vendors requested/received the RFI document. Twenty-six (26) submissions were received by the City by the closing date of June 22, 2018. The review period will take place between July and September. In alphabetical order, the City received submissions from the following organizations:

1. 3Wayste North America
2. AIM Environmental Group Inc.
3. Anaergia Inc.
4. BHR Resource Recovery Inc.
5. Bradam Canada Inc.
6. Canada Fibers Ltd
7. CCI BioEnergy Inc
8. CHAR Technologies Ltd.
9. Clearblue Ltd.
10. Clorox Company of Canada
11. Corporation of the City of Stratford
12. Cole Engineering Group Ltd.
13. Eco Burn Inc.
14. Enerkem Inc.
15. Envac OPtibag AB
16. EverGreen Energy Corp
17. Fresh Technologies, Inc.
18. Green Shields Energy
19. Groupe Bioenertek Inc
20. Miller Waste Systems Inc.
21. Orgaworld Canada a division of Renewi
22. Pivotal Integrated Resource Management Inc
23. Sacyr Environment USA, LLC
24. Stormfisher
25. Tucker Engineering Associates, Inc.
26. Walker Environmental Group

7. Preliminary Analysis

Complete:	0%	In Progress:	20%	Not Started:	80%

A preliminary analysis of the potential programs/initiatives will be completed looking at environmental (diversion rate, Greenhouse Gas benefits); social (public support, resident benefits/issues); financial (costs, revenue) and technical (collection/processing issues, stability of end markets, status of technology) considerations.

8. Peer Review

Complete:	0%	In Progress:	0%	Not Started:	100%

A consulting firm that specializes in waste management technologies will be used to conduct a peer review of the portions of the Resource Recovery Strategy dealing with any technical analysis and newer resource recovery technologies.

5.3 CURRENT TIMETABLE AND PROPOSED DIRECTION FOR RESOURCE RECOVERY STRATEGY

The general activities and actions and timetable to complete the Resource Recovery Strategy is identified on Table 21. It is worth noting that this timeframe crosses over the existing Council (December 2014 to November 2018) and the next Council (2018 to 2022). The timetable may be adjusted to accommodate new information and/or direction.

Table 21 – Proposed Activities and Timetable to Complete Resource Recovery Strategy

Date	Event	Comments
July - December		• Incorporate any new details that may by identified during the final stages of the Action Plan
January - March 2019	CWC Meeting	• Present the Resource Recovery Strategy
	Council	
2 months	Provide feedback opportunities on WhyWaste Resource Recovery Strategy website	• Advertise in the London Free Press, The Londoner and on social media
	Circulate to Community Stakeholder Groups	• Circulate and ask for feedback from Waste Management Community Liaison, Committee (WMCLC), W12A Landfill Public Liaison Committee, Urban League and Advisory Committee on the Environment (ACE)
	Circulate to Waste Management/ Recycling Companies	• Circulate and ask for feedback from local companies including Emterra, Green Valley Recycling, Miller Waste, Orgaworld, StormFisher, Try Recycling, Waste Connections and Waste Management
	Presentations	• Present to WMCLC • Present to ACE
1 month	Public Participation Meeting	• CWC receives comments from the public and other stakeholders

6) SUMMARY OF KEY IMPLEMENTATION REQUIREMENTS

For the 60% Waste Diversion Action Plan to be successfully implemented, additional steps, actions and nudging/changing attitudes are required. Listed below are 15 implementation requirements that will be very helpful in moving from 45% waste diversion to the target of 60% waste diversion by the end of 2022.

The challenges, opportunities and rewards of achieving 60% waste diversion require Londoners to embrace change. At the same time, Londoners will be required to accept that new programs come with some frustration and inconvenience. However, increasing waste diversion should be considered as a long-term environmental investment opportunity in a similar light as our investments in education and health care.

These Top 15 requirements, in brief, have been developed from successful initiatives in London, a literature review of successful waste diversion programs in other communities, and successful implementation of programs in related services.

1. **Supportive elected officials and City Council.** Elected officials are key to engaging their constituents in a manner that meets their needs. Consistent information that contains easy to understand expectations for all involved is key. A common voice, whenever possible, builds confidence in decisions and direction made by Council.

2. **Sustainable program funding**. Programs must be funded to meet requirements, meet community expectations and balance other priorities in the community.

3. **The role of media.** Media play a critical role in informing the community about waste diversion initiatives and programs. It is critical that information is easily accessible and that spokespeople are available to respond to media requests for additional information. This will help the community learn about new initiatives and programs, as well as encourage them to obtain further details to help them understand how to participate.

4. **Well-developed implementation workplans.** A number of the undertakings in the 60% Waste Diversion Action Plan are significant. Workplans must address resource needs, timeframes, contractor requirements, and allow for adequate time for Londoners to adjust.

5. **Demonstrate leadership through examples**. Members of Council, City staff and community leaders must demonstrate that they are part of the change and prepared to participate in the new waste diversion programs and initiatives (“lead by example” and “practice what you preach”).

6. **Delivery of information, education and promotion on how to participate in new initiatives and programs**. There are important similarities and differences between information (e.g., how to participate), education (e.g., why should I participate) and promotion (e.g., how to increase participation). Because Londoners have been at 45% waste diversion since about 2014 and few new initiatives/programs have been added during that time, there will be an appetite for new materials. Examples of tools

and outreach programs from other communities will be key to reducing the learning curve and containing/reducing costs of production. The role and value of social media is constantly changing.

7. **Convenient, accessible and understandable services.** The more Londoners are asked to do, the more challenges can occur. It must be recognized that waste diversion and waste reduction are not priorities for many families. Services need to be considered in the context of all Londoners and be as accessible as possible.

8. **Willingness of many Londoners to embrace changes.** Londoners need to be behind these programs and embrace a culture of change.

9. **Incentives and rewards need to be considered.** Wherever possible, incentives and rewards should be considered to help with achieving the new and/or adjusted behaviours required for Londoners.

10. **Strong and enforceable by-laws also must be considered.** By-laws may be required as a backstop for certain actions (e.g., mandatory recycling, use of clear nags, etc.).

11. **Strong collaborations to deliver the new programs.** Opportunities to have shared implementation experiences and other collaborations will assist in achieving results in different communities in London.

12. **Build local capacity in the community.** Many of the initiatives will not led by the City, rather they will be led by the community. This can be achieved by ensuring that resources are available and a collaborative approach is established at the start.

13. **Flexibility and transition capabilities**. Some initiatives and programs planned today may need to be adjusted prior to implementation or after implementation. A certain mind-set is required to allow some initiatives and programs to develop on their own. This can allow for additional creativity, innovation and fun. In addition, larger programs can be designed at the outset to have transition capabilities as new technology and techniques become available.

14. **Tracking and measurement systems.** It is imperative that understandable tracking and measurement systems are established prior to implementation. Tracking and measuring progress is essential for continually improving waste diversion programs. Successful communities will track and benchmark their waste diversion performance, including participation rates, quantity and volume of materials diverted, customer satisfaction, and programs costs, revenues and other savings.

15. **Regular feedback.** Opportunities to provide feedback and information to elected officials, residents, media, businesses, service providers, etc. will ensure that progress (or lack of progress) is being shared. An annual report on waste diversion performance in an easy-to-read format that can be widely shared (in different formats) will be key.

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.

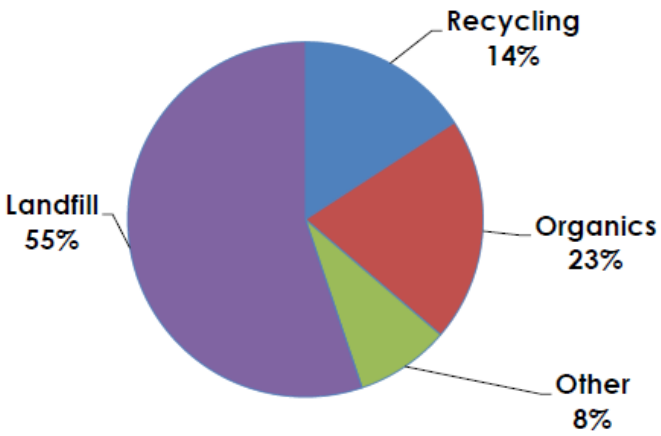
This data is summarized in Table A-1 and Figure A-1.

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

B1 Open House 2

B2 Open House 1

B3 Community Events

B4 Other Engagement

B5 Project Website

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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.

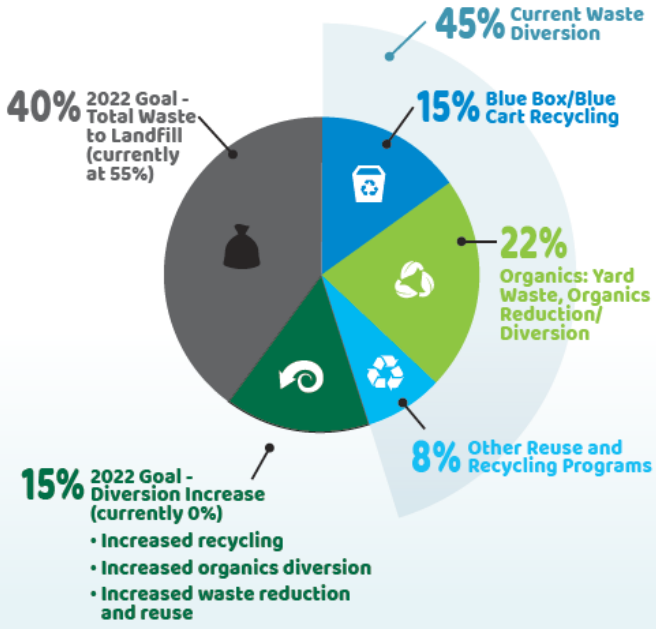
Comments were received through completion of the formal feedback sheet from 34 people. In addition, one email exchange was received where the public provided feedback. Overall, meeting attendees were satisfied with the information presented and provided positive feedback on the quality of the information 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

6

FEEDBACK REQUESTED

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

7

FEEDBACK REQUESTED

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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London

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

11 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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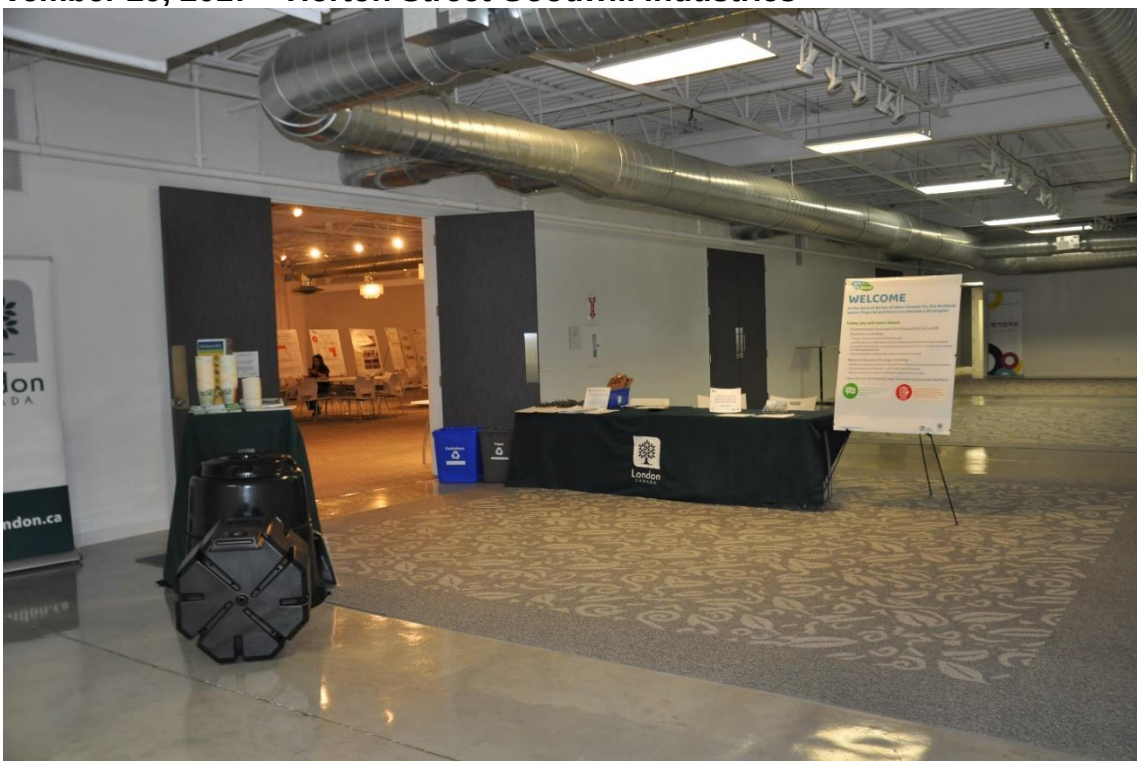
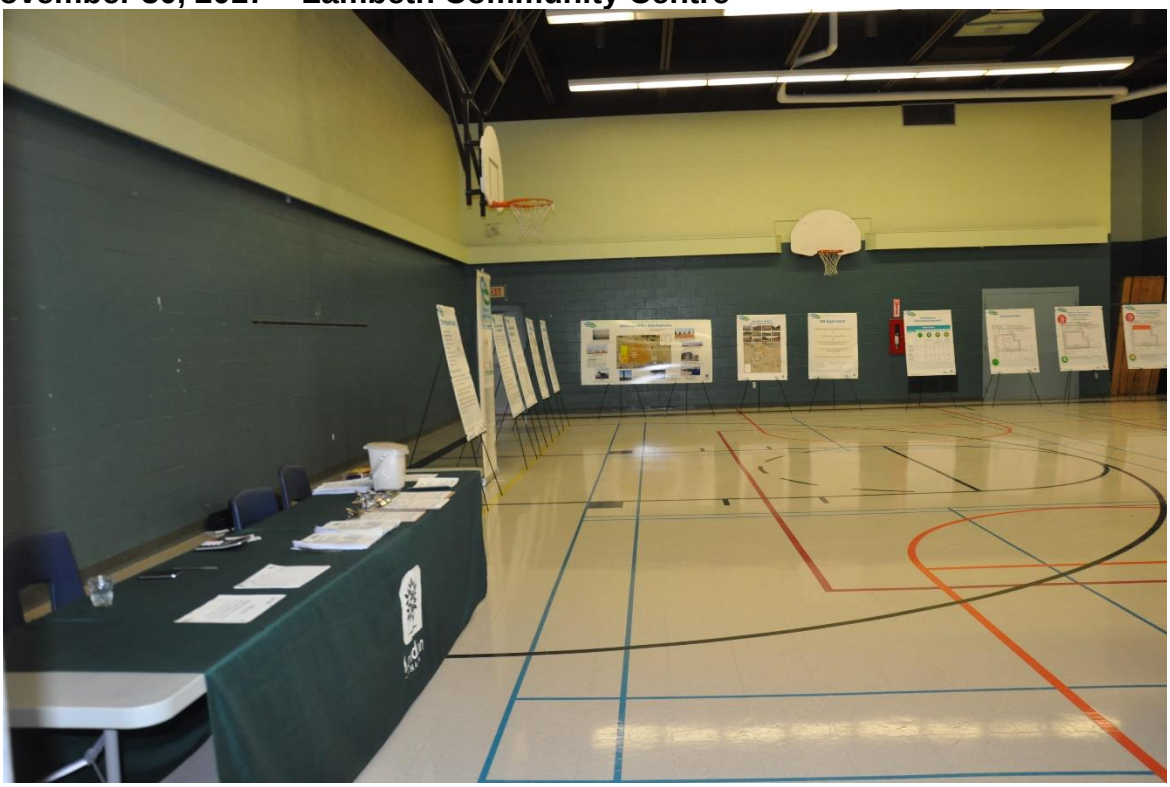
London

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.

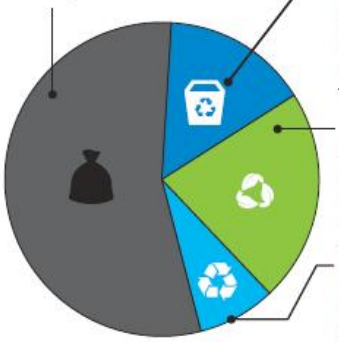
Comments were received through completion of the formal feedback sheet from five people. In addition, two email exchanges and a phone call were received where the public provided feedback. The public also provided thoughts on the City's Facebook page. Overall, meeting attendees were satisfied with the 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)

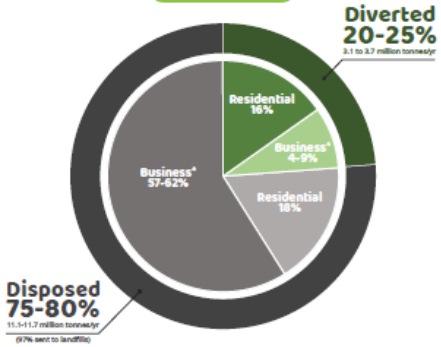
London

Why Waste?

London and Provincial Total Waste Diversion Rates

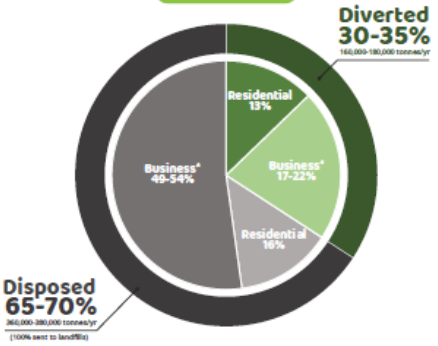
Solid Waste in Ontario

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

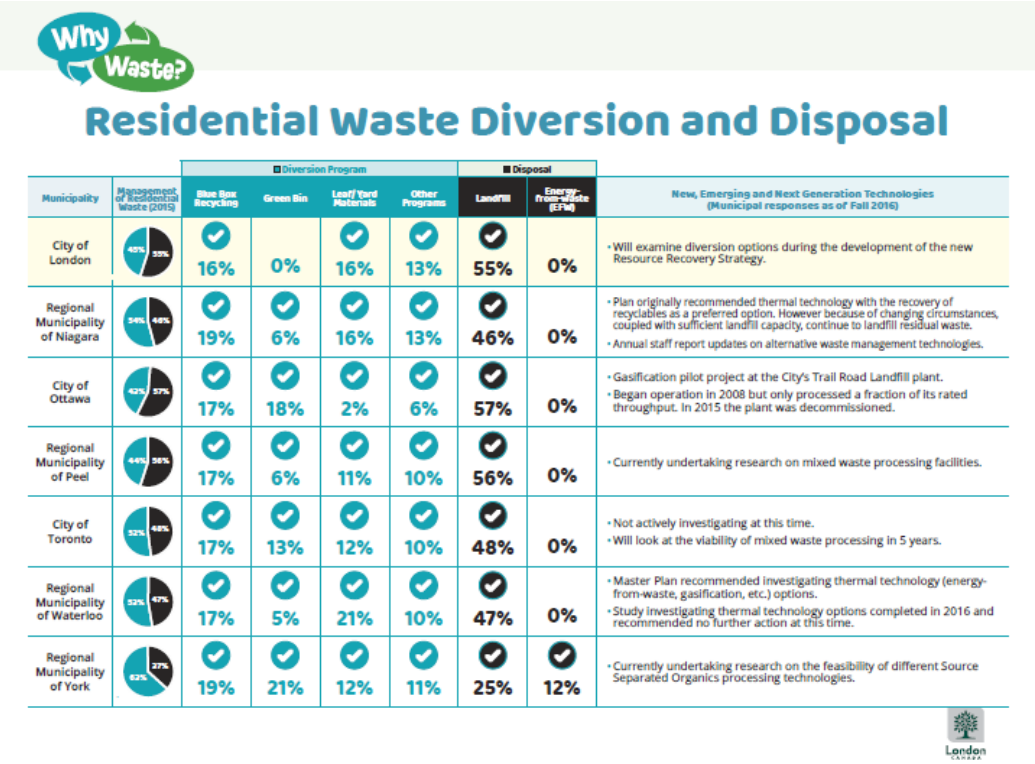
London

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.

London CANADA



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	73% 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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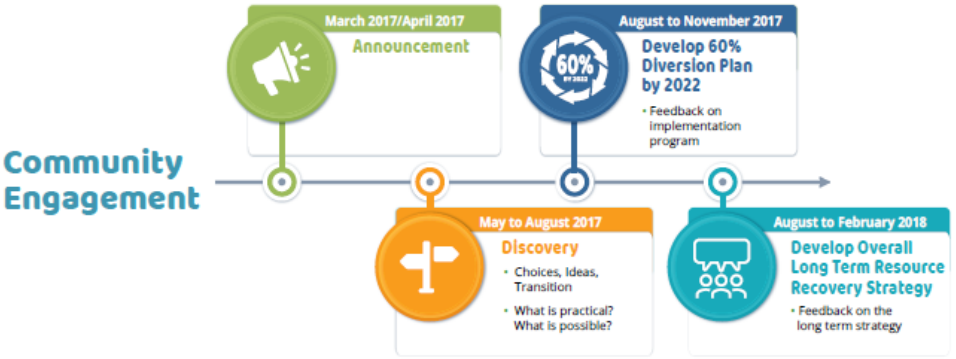
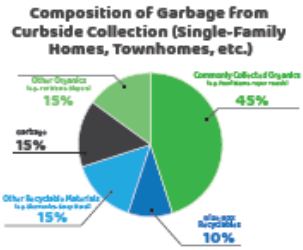
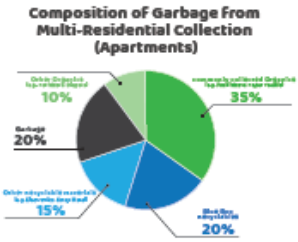
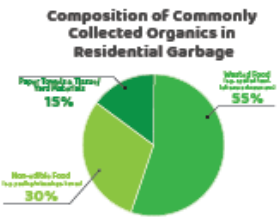
Resource Recovery Strategy Process

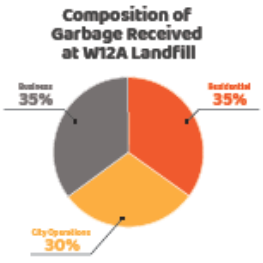


What is in the Garbage (Residual Waste)?









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 Ipsos

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METHODOLOGY & SAMPLING

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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

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KEY FINDINGS

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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.

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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.

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WASTE DIVERSION ATTITUDES & BEHAVIOURS

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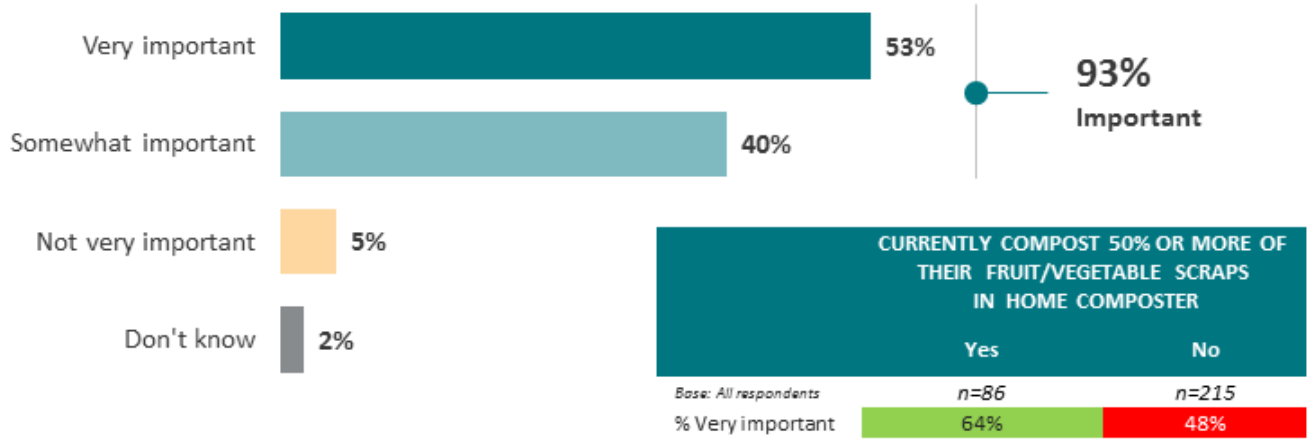
IMPORTANCE OF WASTE DIVERSION

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)

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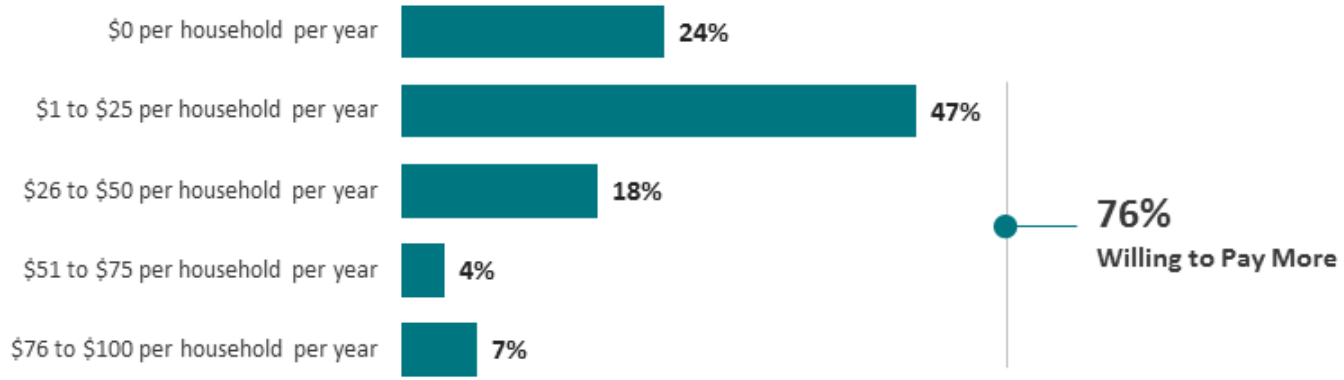
WILLINGNESS TO PAY MORE FOR INCREASED WASTE DIVERSION

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)

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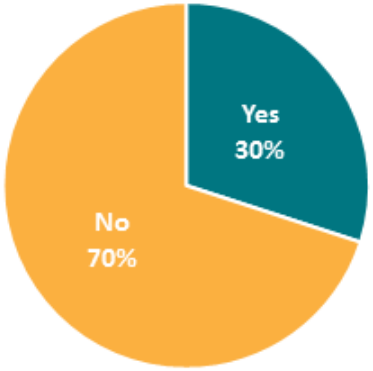
CURRENT COMPOSTING BEHAVIOUR

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)

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*Small base
**Extremely small base

WASTE DIVERSION INITIATIVES

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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.

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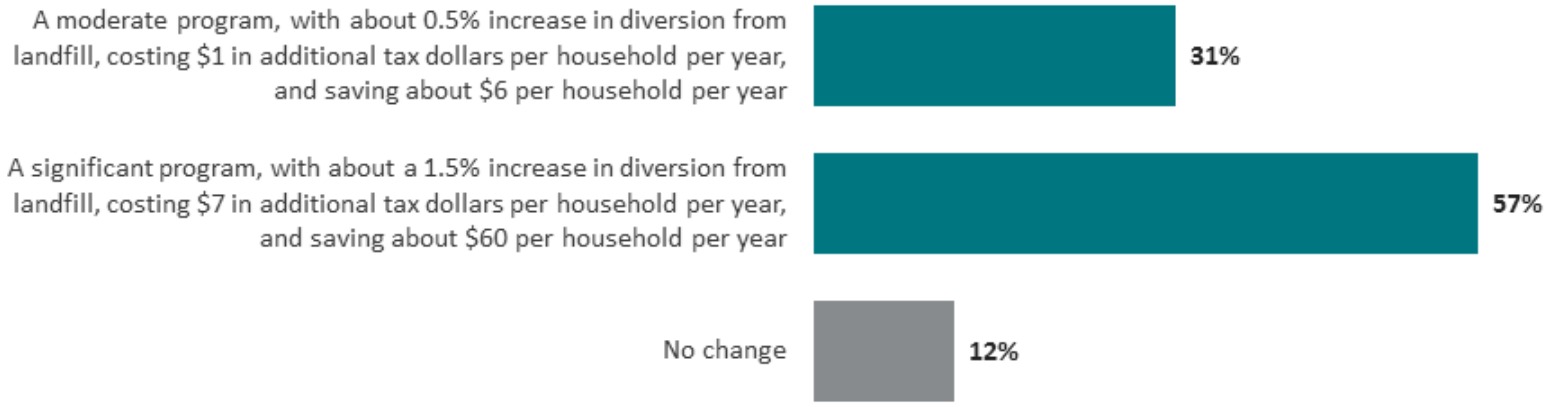
PREFERRED INVESTMENT OPTIONS FOR CITY

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)

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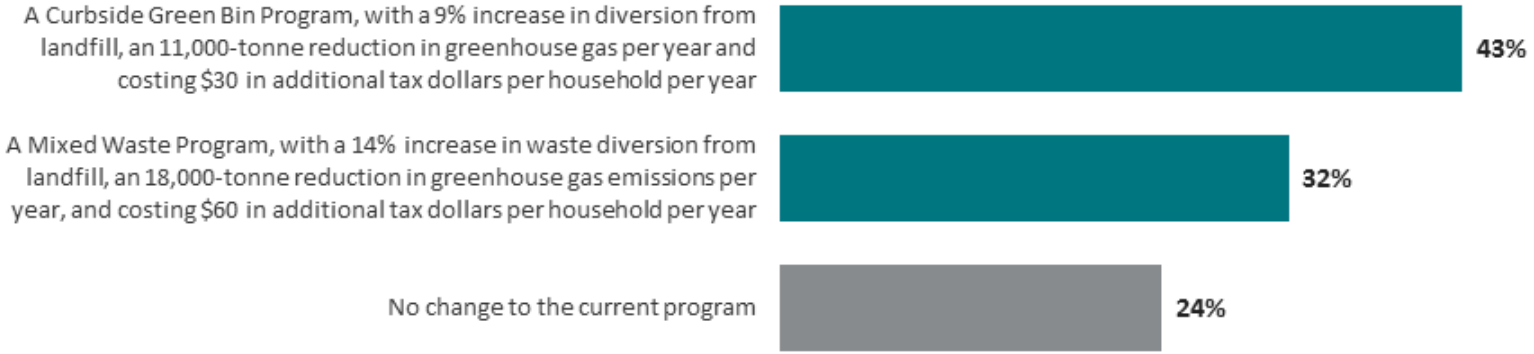
PREFERRED CITY-WIDE ORGANICS CURBSIDE PROGRAM

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)

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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%

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

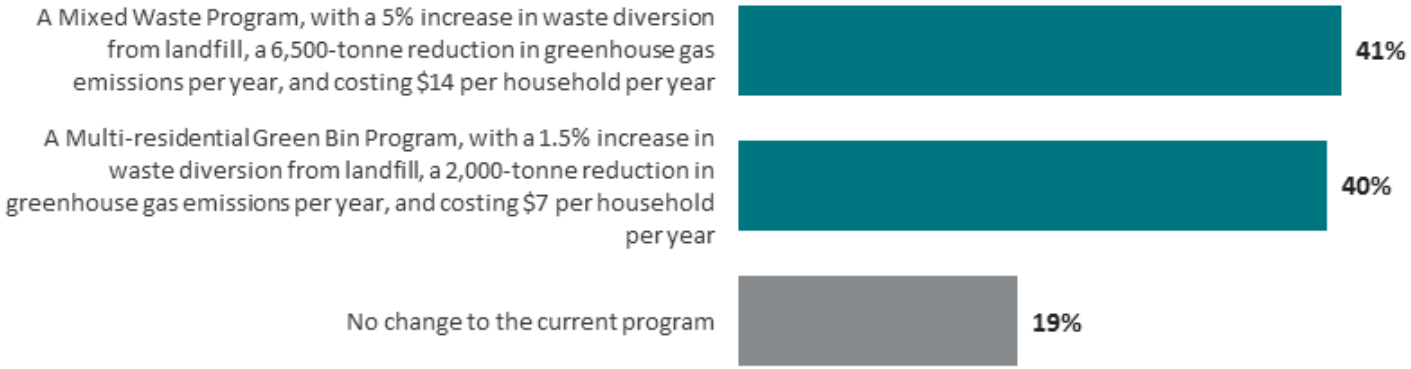
*Small base (under n=100)

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)

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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)

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DROPPING OFF MATERIALS AT RECYCLING DEPOT

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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.

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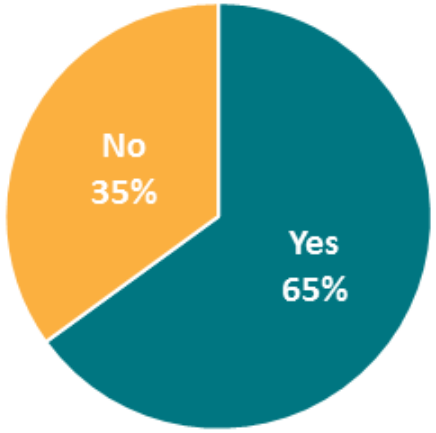
PREPARED TO DELIVER MORE MATERIALS TO DROP-OFF DEPOTS

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)

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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.

	AGE			TIME LIVED IN LONDON		HOUSEHOLD INCOME BEFORE TAXES		
Prepared To Deliver More Materials	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

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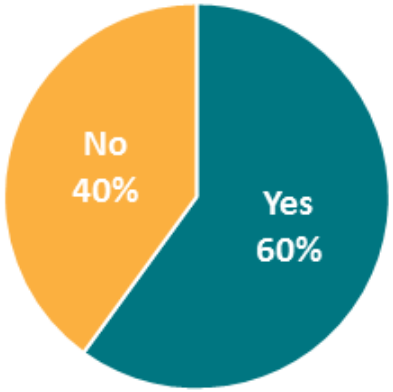
BANNING ADDITIONAL MATERIALS FROM GARBAGE PICKUP

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)

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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	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
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

159 Ridout Street South, London, Ont. N6C 3X7
Paul van der Werf Tel: 519-645-7733
Email: 2cg@sympatico.ca

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Appendix 1- Material Categories and Description

Appendix 2- Audit “Fines” Category Visual Analysis

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

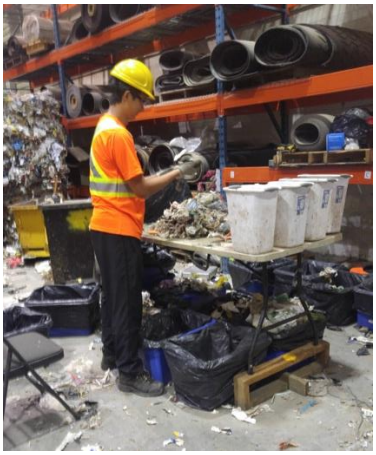


Photo 2. Waste sorting set up

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

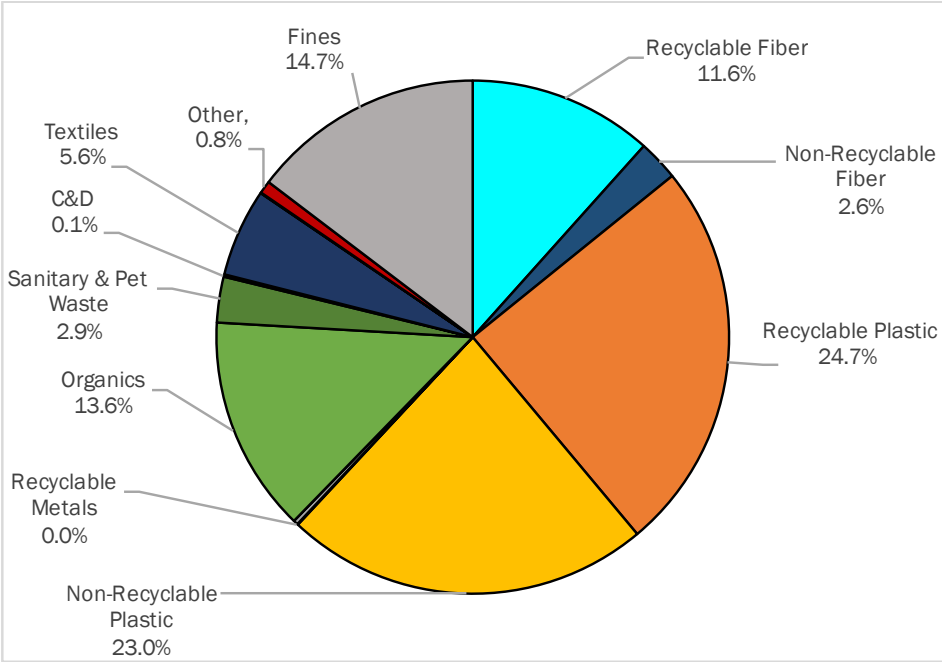
Five sub-samples of curbside "lights" fraction weighing a total of 45.12 kg were sorted (Photo 3). The overall results of the curbside "lights" fraction can be found in Table 3.1 in Appendix 1.

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

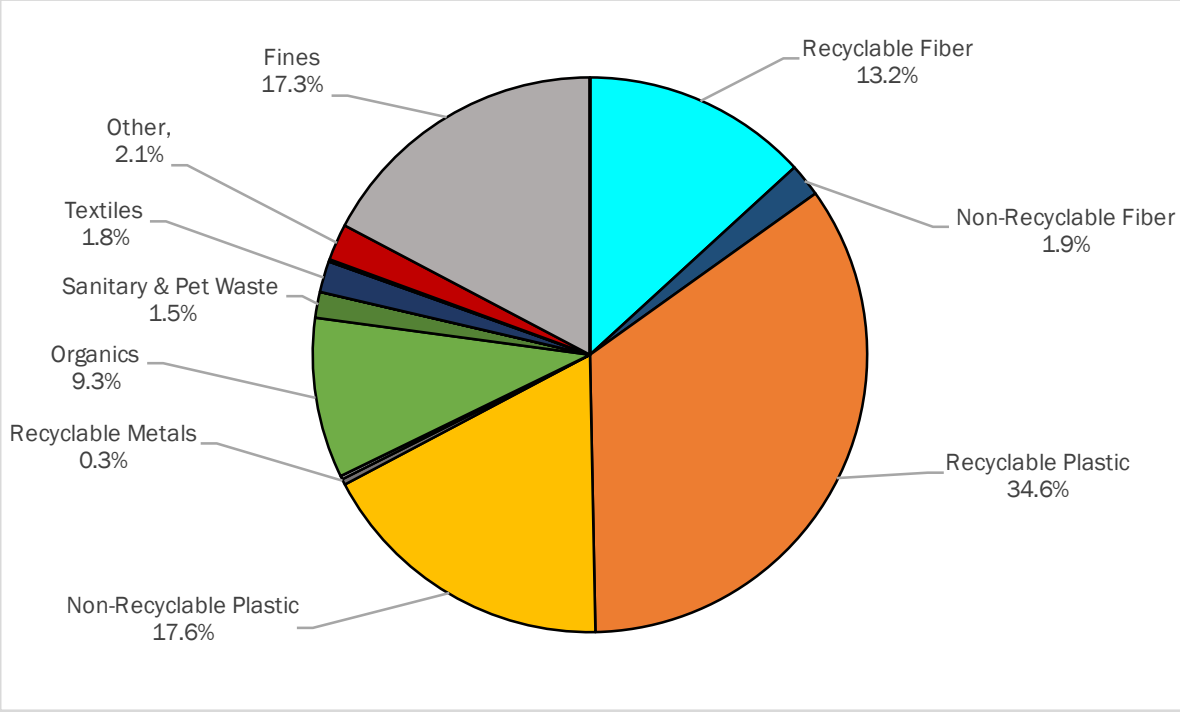


Figure 3.2 Overall Curbside & Multi-Residential Light Waste Fraction Composition

3.3 Curbside "Medium-Heavies" Fraction

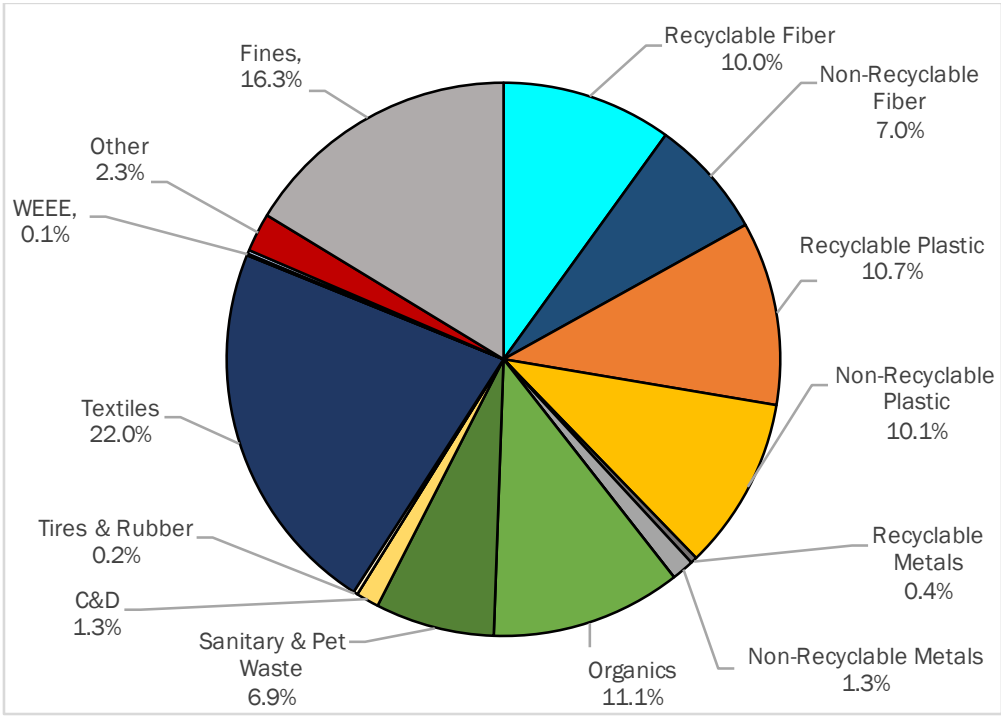
Five curbside sub-samples of "medium-heavies" weighing a total of 73.16 kg were sorted (Photo 4). The overall results of the curbside "medium-heavies" fraction can be found in Table 3.3 in Appendix 1.

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



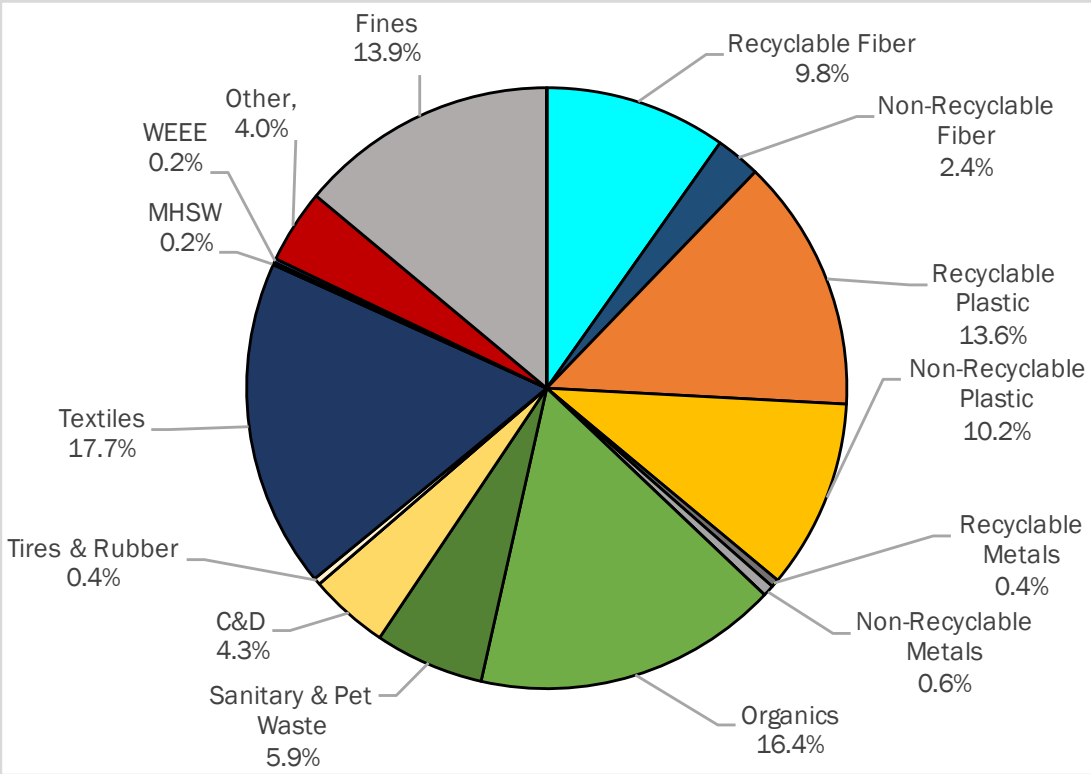
3.4 Curbside & Multi-Residential "Medium-Heavies" Fraction

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

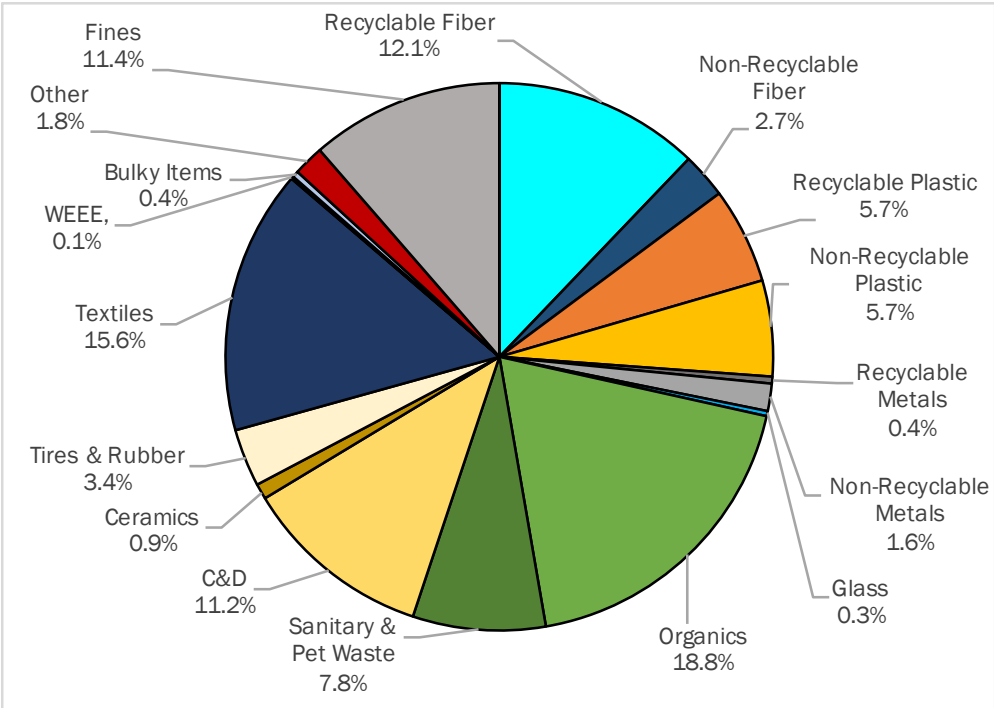
Four curbside sub-samples of curbside "heavies" fraction weighing a total of 69.26 kg were sorted (Photo 5). The overall results of the curbside "heavies" fraction can be found in Table 3.5 in Appendix 1.

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



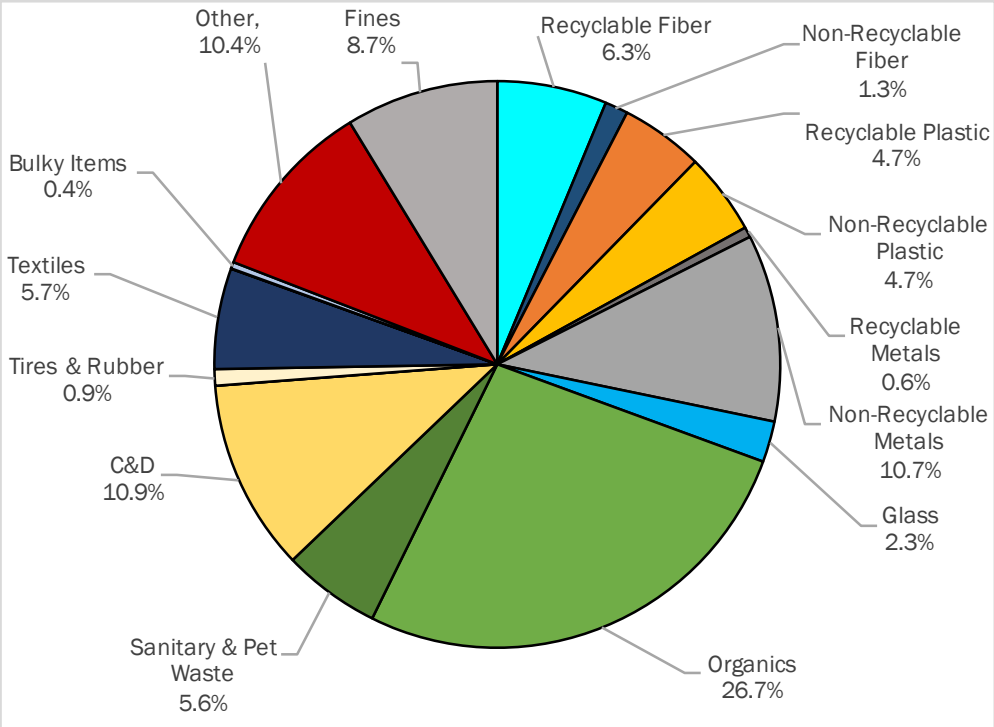
3.6 Curbside & Multi-Residential "Heavies" Fraction

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

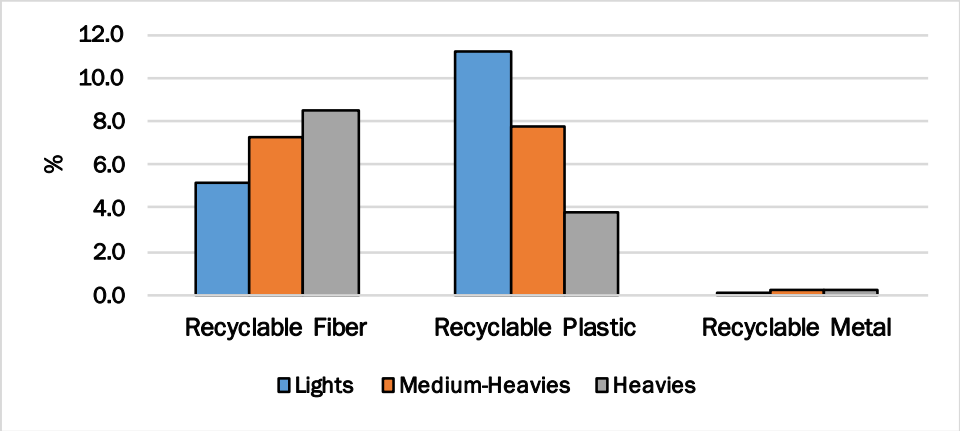


Figure 3.8 shows the proportion of non-recyclable materials compared for the three curbside waste fractions. It shows that non-recyclable fiber was primarily found in "medium-heavies". Non-recyclable plastic is most prominent in "lights" and "medium-heavies". Non-recyclable metals are most prominent 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

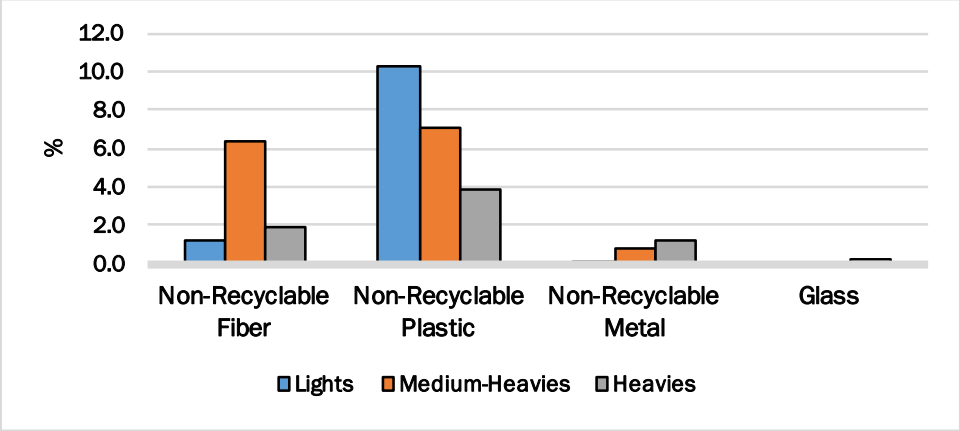


Figure 3.9 shows the proportion of residual materials compared for the three waste fractions. It shows that there is a considerable amount of textiles, which are most prominent in "medium-heavies" fraction.

Figure 3.9 Comparison of Residual Material in Waste Fractions

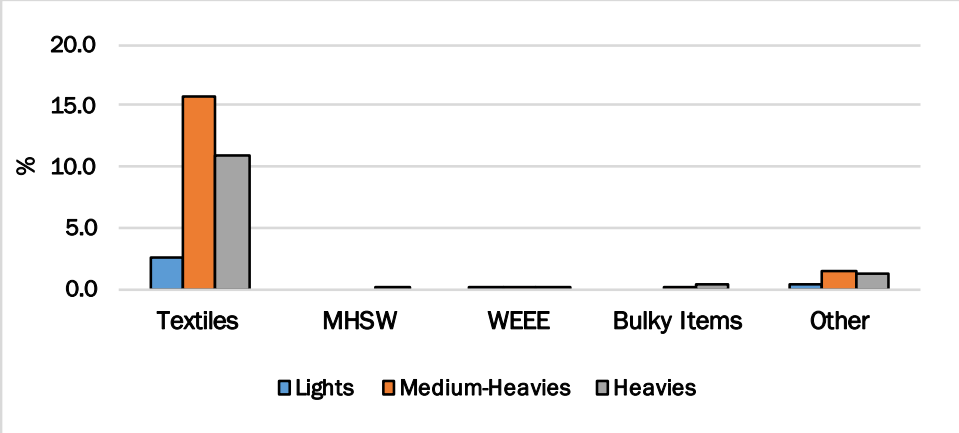


Figure 3.10 shows the proportion of organic materials compared for the three waste fractions. It shows that organic waste is more prominent in “heavies”. This is largely due to the roll-off (round organics enter the “heavies” roll-off bin). Sanitary & pet waste was found to be equally prominent in “medium-heavies”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

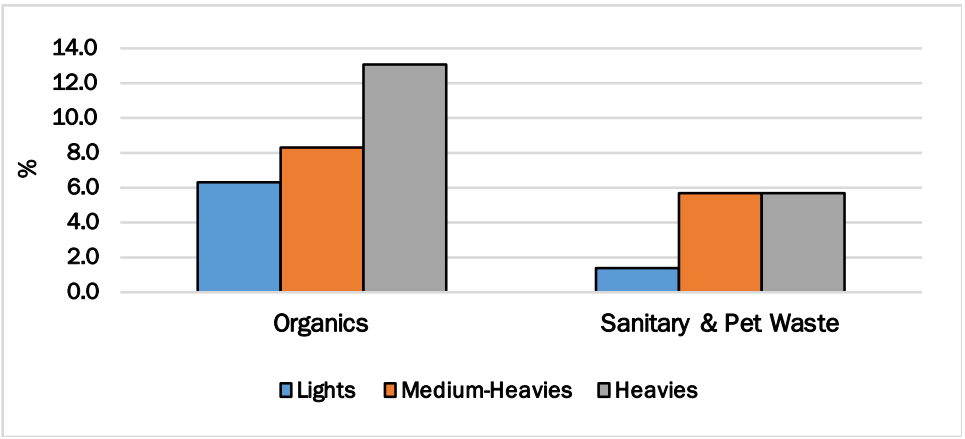


Figure 3.11 shows the proportion of construction materials compared for the three waste fractions. It shows that the majority of construction materials were found in the “heavies”, followed by “medium-heavies”. There was no ceramic or tires & rubber in “lights”.

Figure 3.11 Comparison of Construction Material in Waste Fractions

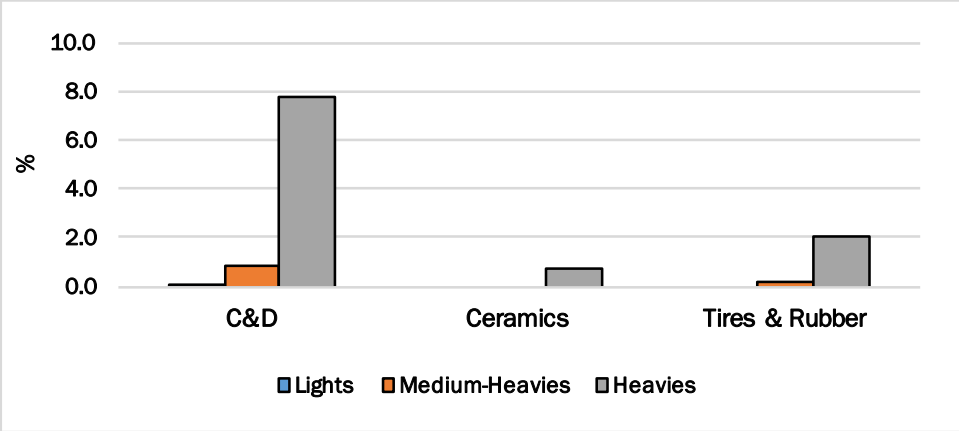
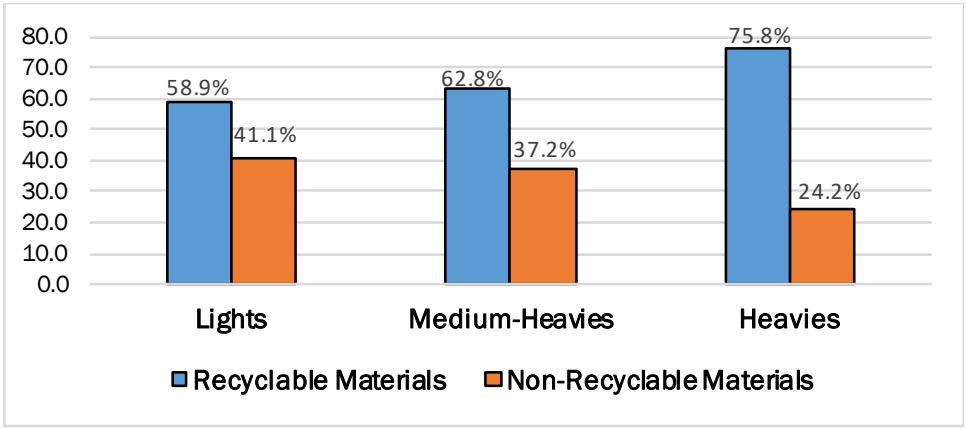


Figure 3.12 shows the overall proportion of recyclable and non-recyclable materials compared for the three waste fractions. It shows that as wastes became heavier, there was an increase in recyclable material and a decrease in non-recyclable materials, with all fractions representing over 55% divertible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

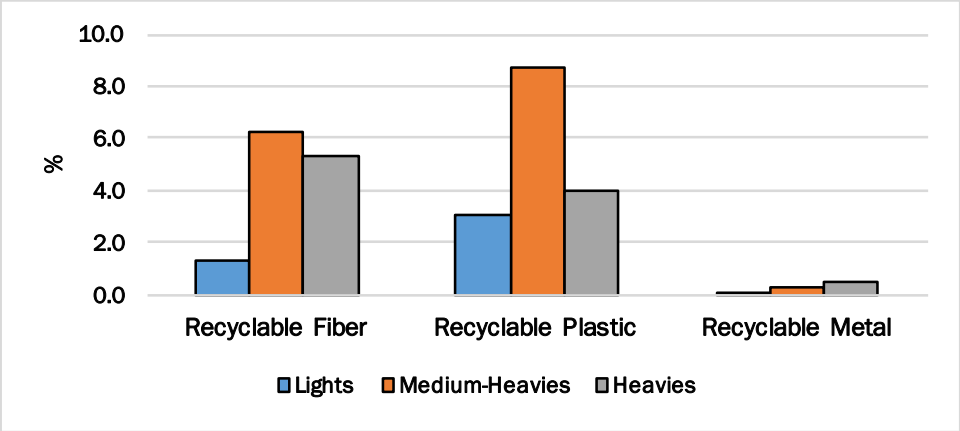


Figure 3.14 shows the proportion of non-recyclable materials compared for the three waste fractions. It shows that non-recyclable fiber and non-recyclable plastic were most prominent for “medium-heavies”, followed by “heavies”. Non-recyclable metal and glass waste proportions were most prominent for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

Figure 3.14 Comparison of Non-Recyclable Material in Waste Fractions

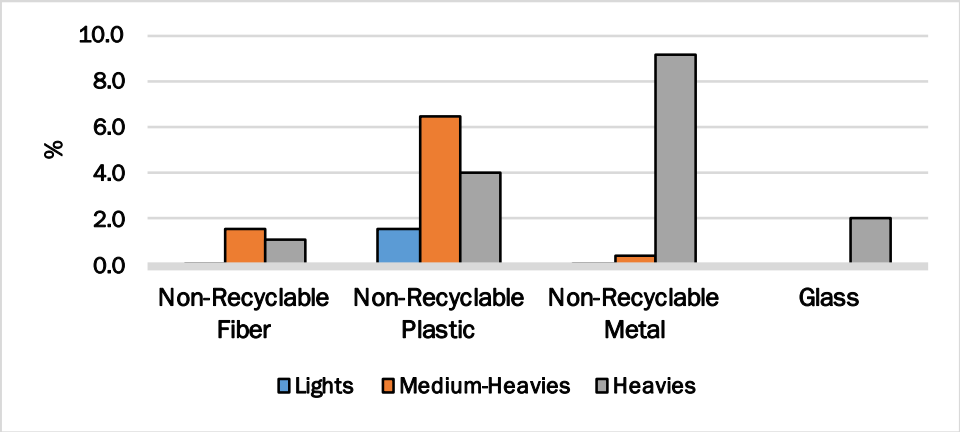


Figure 3.15 shows the proportion of residual materials compared for the three waste fractions. It shows that there is a considerable amount of textiles, which are most prominent in “medium-heavies” fraction. The amount of Other residuals increases with waste fraction.

Figure 3.15 Comparison of Residual Material in Waste Fractions

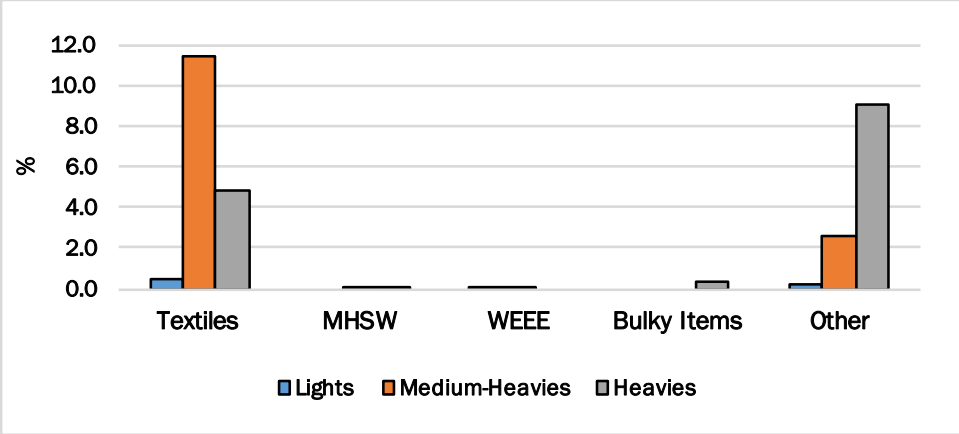


Figure 3.16 shows the proportion of organic materials compared for the two waste fractions. It shows that organic waste and sanitary & pet waste proportions increased as wastes became heavier.

Figure 3.16 Comparison of Organic Material in Waste Fractions

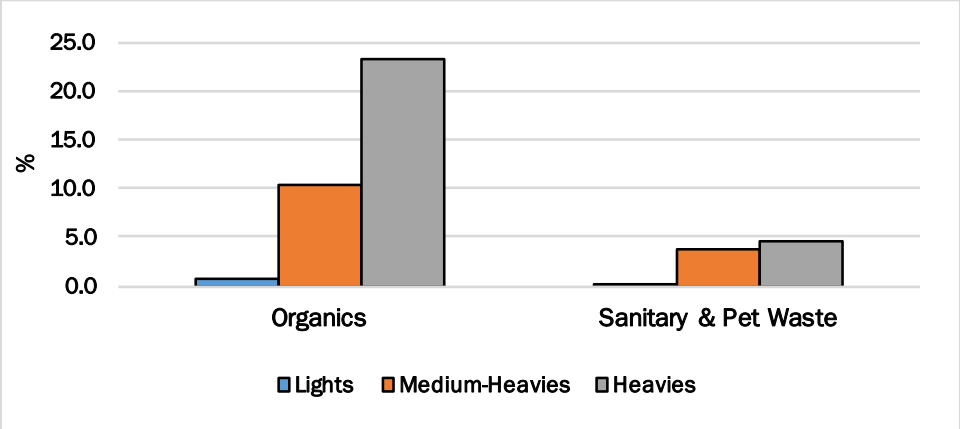


Figure 3.17 shows the proportion of construction materials compared for the two waste fractions. It shows that C&D and tires & rubber are most prominent in the “medium-heavies” waste stream. No ceramic was found in curbside & multi-residential waste.

Figure 3.17 Comparison of Construction Material in Waste Fractions

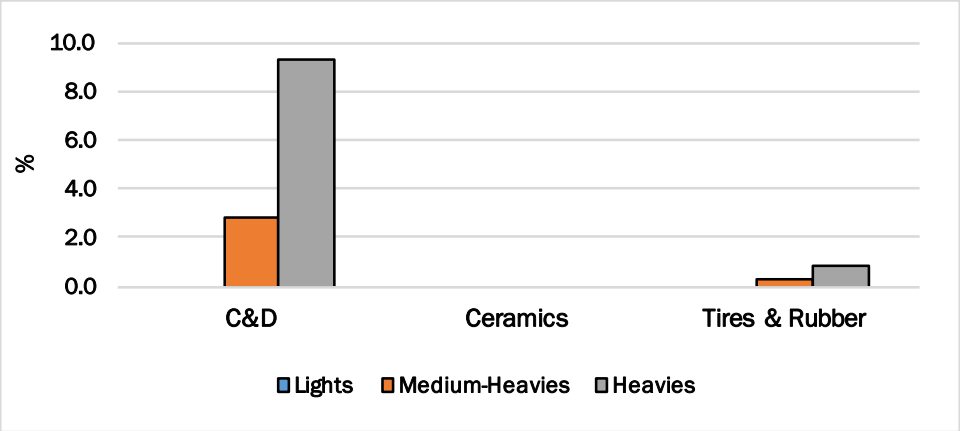
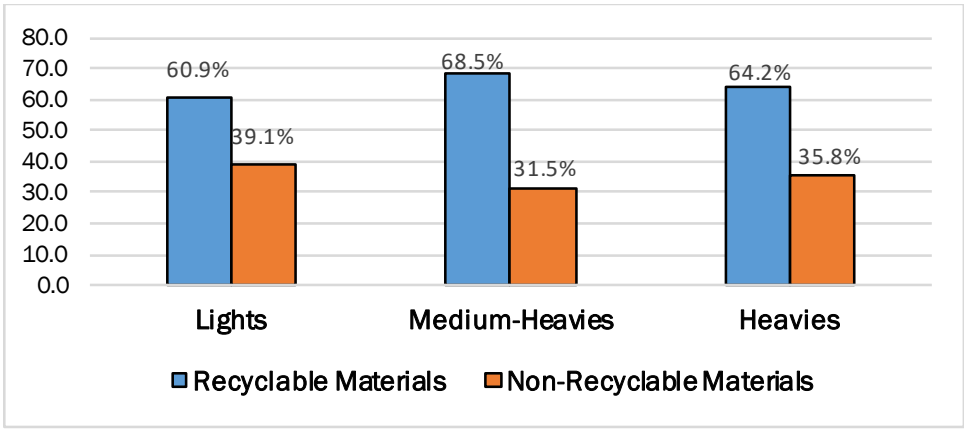


Figure 3.18 shows the overall proportion of recyclable and non-recyclable materials compared for the two waste fractions. It shows that the highest amount of recyclable materials occurred in the medium-heavies fraction. However, all fractions had more than 60% of potentially recyclable materials.

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

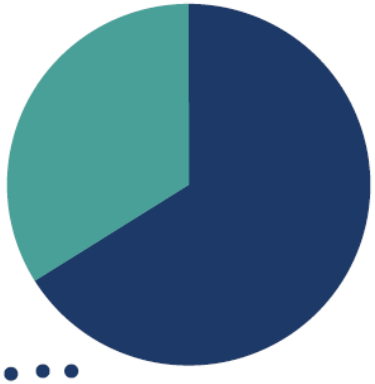
Preliminary results from pilot to assess viability of recovering resources from City of London's mixed solid waste stream.

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 %

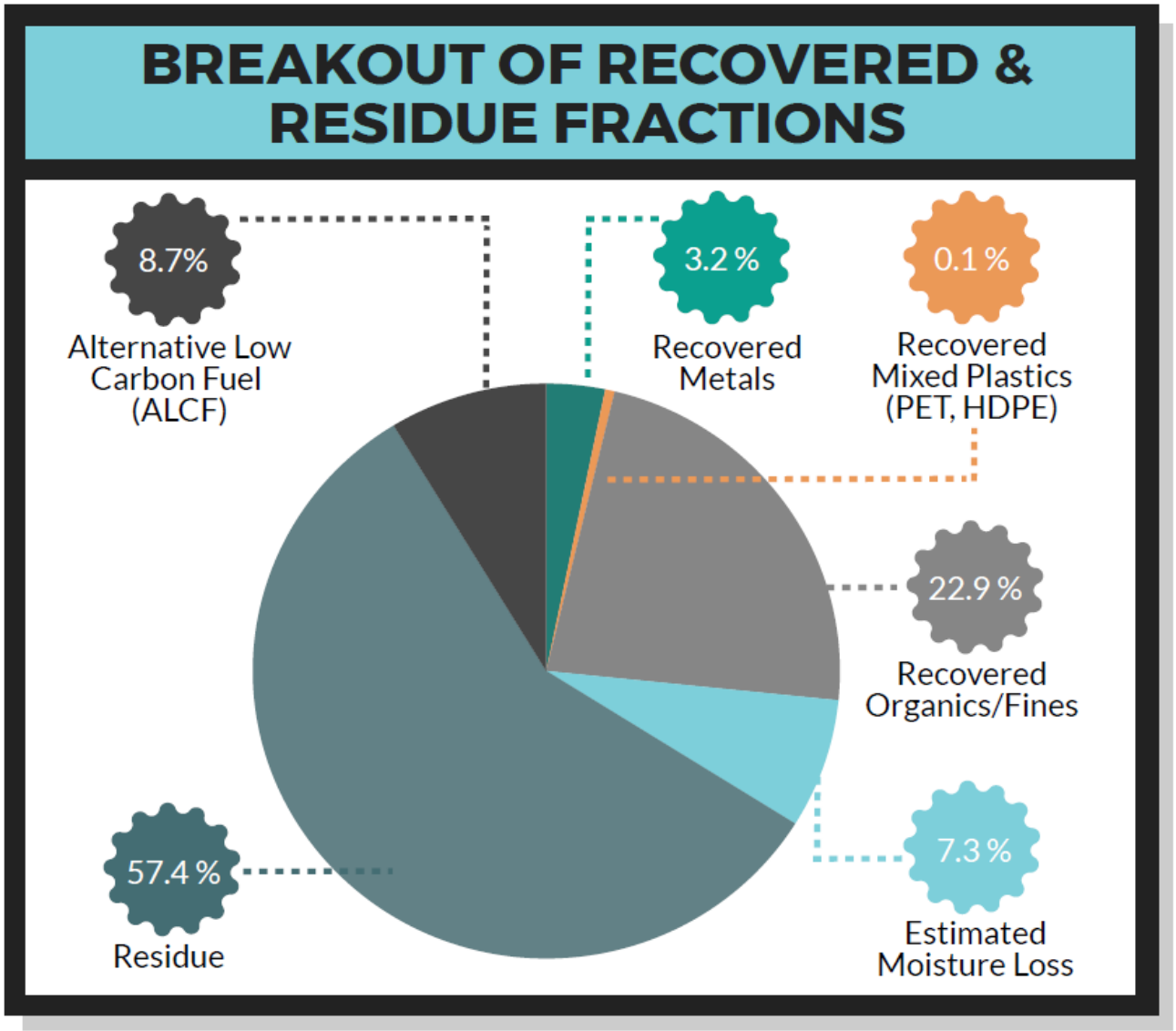
Residue Fraction

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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Presentation to Waste Management Working Group

July 13, 2018

Environmental & Engineering Services

60% Waste Diversion Action Plan

What's in the garbage?

Single Family Homes

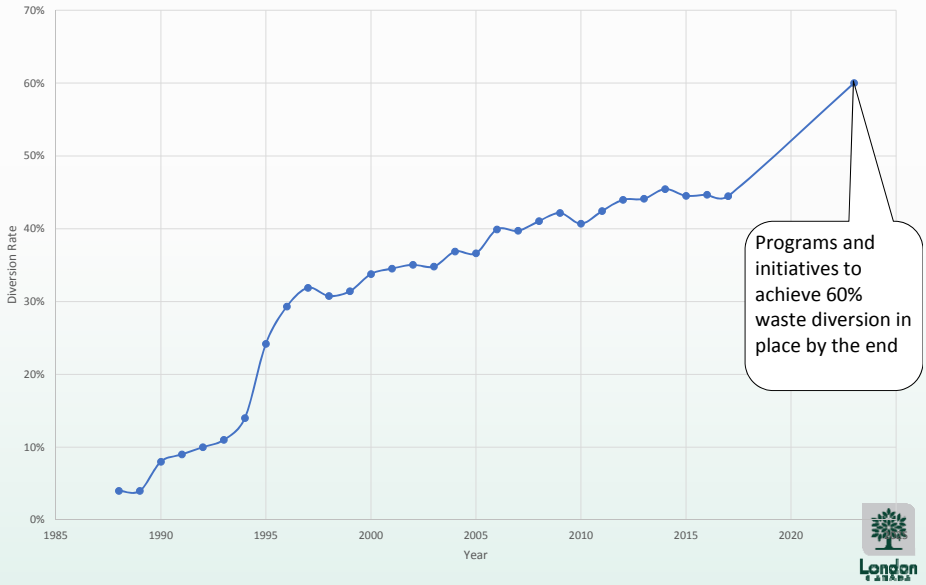
Apartments

Waste Management Working Group:	July 13, 2018
Civic Works Committee:	July 17, 2018
Municipal Council:	July 24, 2018
Community Engagement:	July 25 – September 27, 2018

Why Waste? getinvolved.london.ca

London CANADA

The Road to 60% Diversion



London CANADA

Council Direction(s)

October 30, 2017 Council direction:

"The W12A Landfill expansion be sized assuming the residential waste diversion rate is 60% by 2022 noting this does not prevent increasing London's residential waste diversion rate above 60% between 2022 and 2050."

Strategic Plan for the City of London (2015-2019):

Increase efforts on more resource recovery, long-term disposal capacity, and reducing community impacts of waste management.

The London Plan (December 28, 2016):

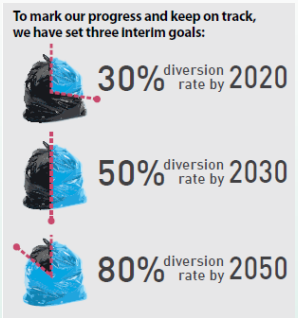
Direction #4 *Become one of the greenest cities in Canada*
#12 Minimize waste generation, maximize resource recovery, and responsibly dispose of residual waste.

Provincial Direction(s)

60% waste diversion goal is a key London commitment as part of the Environmental Assessment for the W12A Landfill expansion

Many Targets ("must")

- 70% reduction/recovery of food and organic waste from SF homes by 2025
- 50% reduction/recovery of food and organic waste generated at the building by 2025

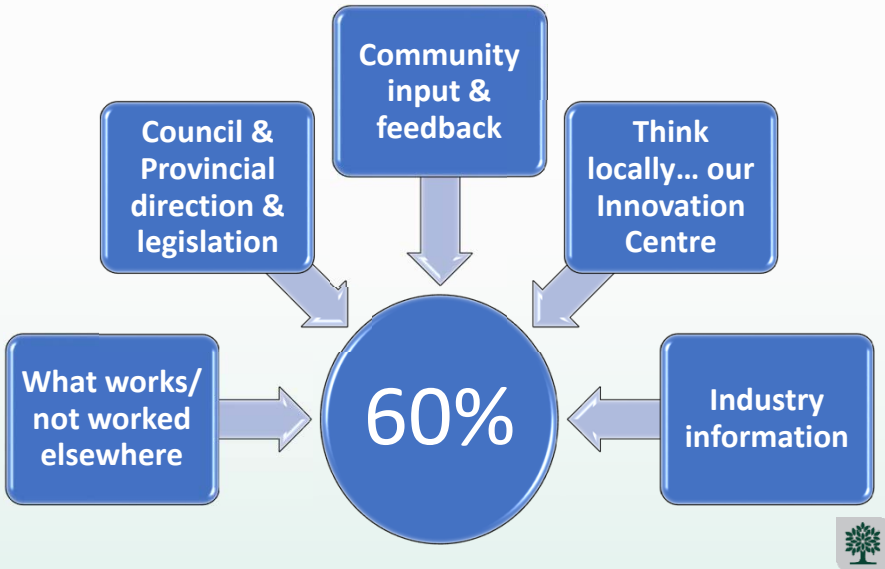


How much waste and resources?

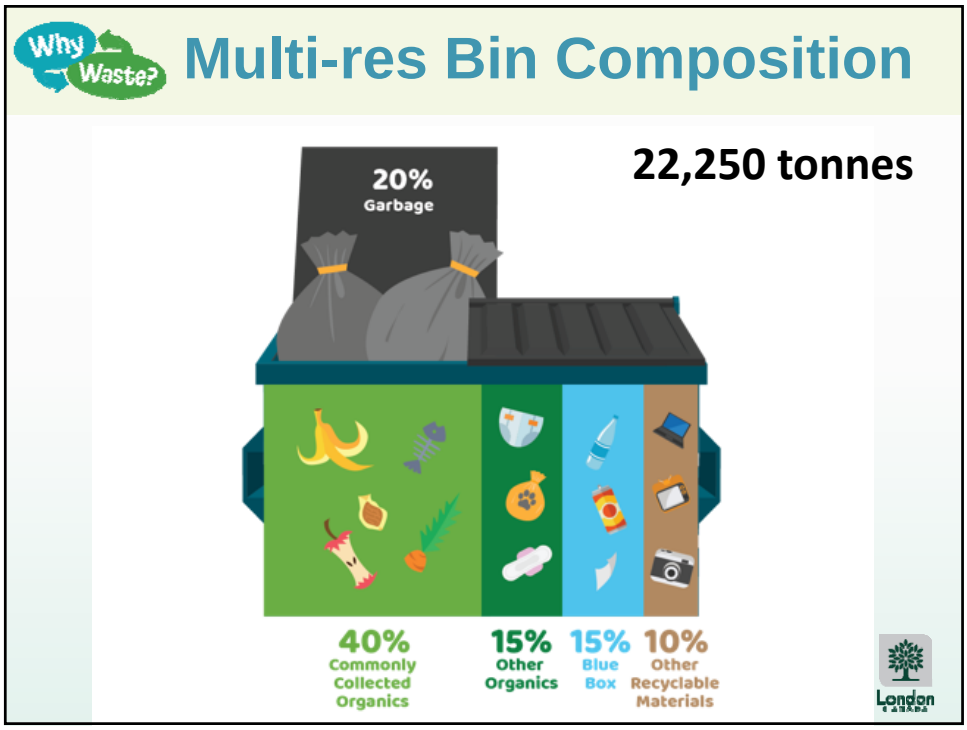
Residential
160,000 tonnes
45% diverted

Between 425,000 and 450,000 tonnes per year

How this Report was Prepared



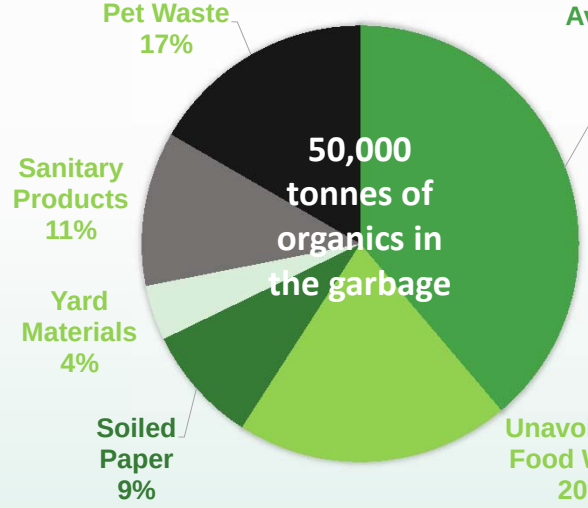

Why Waste?
Curbside Bag Composition
61,200 tonnes
20%
Garbage
7%
Blue Box
15%
Other
Organics
10%
Other Recyclable
Materials
3%
Future
Recyclable
Materials
45%
Commonly
Collected
Organics
London


Why Waste?
Multi-res Bin Composition
22,250 tonnes
20%
Garbage
40%
Commonly
Collected
Organics
15%
Other
Organics
15%
Blue
Box
10%
Other
Recyclable
Materials
London

Why Waste? Composition – *Did You Know!!*

Top 5 Diversion Opportunities	Estimated tonnes	% of Waste	Kg/hhld/ year
1. Avoidable food waste	19,300	24%	107
2. Unavoidable food waste	10,100	12%	56
3. Pet waste	8,500	10%	47
4. Items for Blue Box/Cart	8,300	10%	46
5. Construction/Reno/Demo	4,700	6%	26
Total	50,900	62%	282

Why Waste? Composition – *Did You Know!!*



About 60% of waste

Blue Box – Blue Carts

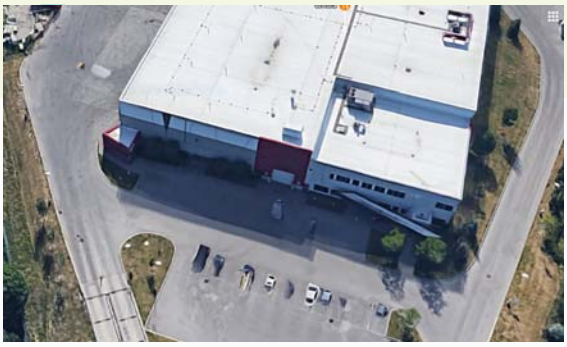
Why is this important?	• Provincial law - shifting to EPR is key • Industry will be funding
How many actions?	• None • Industry will be responsible • Council/City staff to continue to push
How much will it divert?	• 1% to 3% • 1,600 to 4,800 tonnes
What is the cost/hhld estimate?	• SAVINGS estimated at $1.5 to $1.8 million by 2023 • SAVINGS $8.00 to $10.00 per year

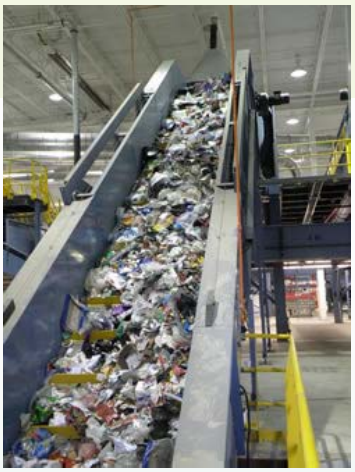
New (or Expanded) Recycling

Why is this important?	• Items are easy to identify/describe • Identified in provincial direction
How many actions?	• 7; some pilot projects • Support local jobs; potential for more • New business opportunities
How much will it divert?	• 0.4% to 0.8% • 640 to 1,280 tonnes
What is the cost/hhld estimate?	• Range $2.00 to $3.00 per year • Likely $2.50

Curbside Organics

Why is this important?	• Largest portion of the waste stream • Proven programs (that have improved) • Legislated
How many actions?	• 2 • Weekly Green Bin, recycling • Biweekly, same day garbage pickup
How much will it divert?	• 8% to 12% • 13,000 to 20,000 tonnes
What is the cost/hhld estimate?	• Range $21.75 to $30.50 per year • Likely $28 • Likely curbside home only $40





Mixed Waste Processing and Mechanical/Biological Treatment (MBT)

FOCUS - Green Bin vs Mixed Waste Processing

MWP Advantages

Environmental
- 25% to 80% more organics captured
- 25% to 80% more GHG reduction

Social
- More convenience
- No "Yuk" factor

MWP Disadvantages

Financial (Curbside Homes)
- Costs $70 to $115/hhld compared to $30 to $45/hhld for Green Bin

Technical
- Rules are evolving
- Uncertainty for product quality

Multi-res Organics

Why is this important?	• Largest portion of the waste stream • Legislated
How many actions?	• 1 • Pilot project (15%) – mixed waste processing and composting/digestion • Follow progress of other communities
How much will it divert?	• 0.5% to 0.7% • 800 to 1,120 tonnes
What is the cost/hhld estimate?	• Range $2.25 to $4.00 per year • Likely $2.75 • Likely Multi-res unit only $62.50

Other Organics Programs

Why is this important?	• Food waste avoidance should be a priority • Lowers costs; community oriented
How many actions?	• 3 • Builds on 2 existing actions, BYC and community composting
How much will it divert?	• 0.3% to 0.6% • 480 to 960 tonnes
What is the cost/hhld estimate?	• Range $1.50 to $2.00 per year • Likely $1.75

FOCUS – Food Waste Avoidance

Local Research (Western University), local Pilot Projects and experience in Canada, USA and Europe

- **Audits – confirmed up to 2/3rds avoidable food waste**
- **$450 to $600 per household ($80 to $100 million/year) in avoidable food**
- **10% reduced = $8 to 10 million saved locally**

Reduction & Reuse

Why is this important?	• Lowers costs; community oriented • Council policies, directions and by-laws set stage
How many actions?	• 7, includes community investment • People are the driving force behind reduction and reuse
How much will it divert?	• 1% to 4% • 1,600 to 6,400 tonnes
What is the cost/hhld estimate?	• Range $0.50 to $2.00 per year • Likely $1.50

FOCUS – Working with the Community

Build Collaborations

Explore options to build community collaborations

More (Fun) Reporting and Feedback . . . celebrating community success

Ipsos Survey June 2018

Parameters

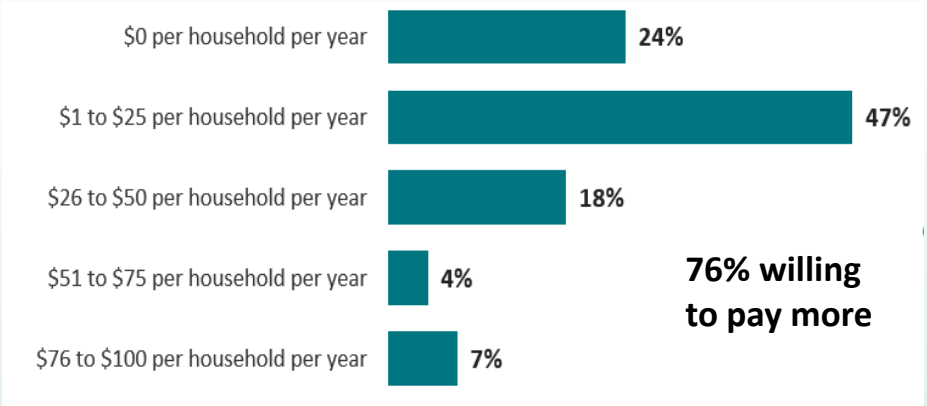
- 301 respondents; Single family and apartments
- +/- 6.4%, 19 times out of 20

Findings

- waste diversion is important (90%)
- support food waste avoidance program (90%)
- support curbside/multi organics program (75%)
- prepared to deliver more to depots (65%)

Ipsos Survey June 2018

Willingness to pay more for increased waste diversion



Benefits

Environmental

- increased waste diversion (33% more)
- reduced GHG gas emissions (equivalent of removing 4,200 to 6,800 cars)
- reduced landfill impacts (odour, traffic)
- better use of material and resources

Benefits

Social

- creation of jobs (between 125 and 170, direct & indirect)
- satisfaction/pride of community

Financial

- short-term landfill cost savings
- avoid long term export costs ($5 to $7 million/year)

Estimated Annual Costs

Program Category	Cost Range	Likely Cost
Blue Box Recycling Improvements	$0	$0
New Recycling Programs and Initiatives	$350,000 - $550,000	$450,000
Curbside Organics Management Program	$3,900,000 - $5,500,000	$5,000,000
Multi-Res Organics Pilot Program	$400,000 - $700,000	$500,000
Other Organic Programs	$250,000 - $350,000	$300,000
Waste Reduction, Reuse Initiatives and Policies	$150,000 - $350,000	$250,000
Total	**$5,050,000 - $7,450,000**	**$6,500,000**

Potential Funding Sources

Source	Potential amount	Possible Date	Who Controls	Level of Risk
Full EPR for Blue Box	$1.5 M to $1.8 M	2022 to 2025	Province	Low
Full EPR for Other Programs	$50,000 to $150,000	2023/ 2025	Province	High
W12A Landfill Levy	$250,000 to $1 M	2020/ 2022	City	Low
Total	**$1,800,000 - $2,950,000 ($2,000,000 likely)**			

Estimated Capital Costs

Program Category	Items	Estimated Cost
New Recycling Programs and Initiatives	• EnviroDepot Improvements	$500,000 to $2,700,000
Curbside Organics Management Program	• Green Bin Carts • Kitchen Catchers • Collection Vehicles	$12,000,000
Other Organic Management Programs	• Community composting	$100,000
Waste Reduction, Reuse Initiatives and Policies	• Reuse facilities	$200,000
Total	**$12.5 - $15 million**	

Annual Cost Summary

	Low	High	Likely (Anticipated)
Cost	$5,050,000	$7,450,000	$6,500,000
Cost/hhld	**$28.00**	**$41.50**	**$36.00**
Revenue	$1,800,000	$2,950,000	$2,000,000
Revenue/hhld	**$10.00**	**$16.50**	**$11.00**
Total Estimated Cost			$4,500,000
Total cost/hhld			**$25.00**

MBNC Cost Comparisons

2016 Municipality	Cost per Tonne		Cost per Household		
	Collection & Disposal	Diversion	Collection & Disposal	Diversion	Total
Hamilton (lowest Diversion & GB)	344	151	150	69	218
Niagara (Lowest with GB)	195	138	90	102	192
Average of 9 GB municipalities	264	234	127	100	227
London (60% - likely cost)	156	161	87	86	173
London (60% - high cost)	156	171	87	91	178

Next Steps – 60%

Next Steps	Comments	Timeline
CWC and Council "Approval in Principle"	• CWC Meeting – July 17 • Council - July 24	July 2018
Seek Community Feedback on Action Plan	• Interactive WhyWaste website • Circulate to Stakeholder Groups • Attend Gathering on the Green II • Presentations to WMCLC and ACE • Public Participation Meeting (Sept. 27)	July to September, 2018
CWC and Council Approval	• Implementation details and final cost estimates to be provided	January/ February, 2019

Waste Management Working Group

Report

2nd Meeting of the Waste Management Working Group
March 8, 2018
Committee Room #3

Attendance

PRESENT: Councillor M. van Holst (Chair); Mayor M. Brown; Councillors M. Cassidy, J. Helmer and S. Turner and J. Bunn (Secretary).

ABSENT: Councillor H.L. Usher.

ALSO PRESENT: W. Abbott, M. Losee, K. Scherr and J. Stanford.

1. Call to Order

1.1 Disclosures of Pecuniary Interest

That it BE NOTED that no pecuniary interests were disclosed.

2. Scheduled Items

2.1 Decision Report #6: Preliminary Proposed Draft Terms of Reference

That, on the recommendation of the Director, Environment, Fleet and Solid Waste, the following actions be taken with respect to the report entitled "Preliminary Proposed Draft Terms of Reference - Environmental Assessment of the Proposed W12A Landfill Expansion, City of London":

a) the release of the report entitled "Preliminary Proposed Draft Terms of Reference - Environmental Assessment of the Proposed W12A Landfill Expansion, City of London" for review and comment by the Government Review Team and the general public BE SUPPORTED; it being noted that minor changes/revisions to the report may be made prior to the release to accommodate preliminary comments from the Ministry of the Environment and Climate Change scheduled to be received by March 14, 2018; it being further noted that the above-noted report was provided under separate cover and a copy is on file in the City Clerk's Office; and,

b) the staff report dated February 15, 2018, with respect to this matter, BE RECEIVED.

3. Consent

3.1 1st Report of the Waste Management Working Group

That it BE NOTED that the 1st Report of the Waste Management Working Group, from its meeting held on January 18, 2018, was received.

3.2 Progress Report #5: Community Engagement Program Update January 11, 2018 to February 28, 2018

That it BE NOTED that the staff report dated March 8, 2018, from the Director, Environment, Fleet and Solid Waste, with respect to an update on the Community Engagement Program (Progress Report #5), from January 11, 2018 to February 28, 2018, was received.

3.3 Background Report #3: Development of 60% Waste Diversion Action Plan

That it BE NOTED that the staff report dated March 8, 2018, from the Director, Environment, Fleet and Solid Waste, with respect to the Development of 60% Waste Diversion Action Plan (Background Report #3), was received.

4. Items for Discussion

None.

5. Deferred Matters/Additional Business

5.1 (ADDED) Waste Management Community Liaison Committee Meeting #5

That it BE NOTED that a summary from the Waste Management Community Liaison Committee Meeting #5, from its meeting held on February 26, 2018, was received.

6. Adjournment

The meeting adjourned at 4:28 PM.

TO:	**CHAIR AND MEMBERS WASTE MANAGEMENT WORKING GROUP MEETING ON JULY 13, 2018**
FROM:	**JAY STANFORD, M.A., M.P.A. DIRECTOR - ENVIRONMENT, FLEET & SOLID WASTE**
SUBJECT:	**UPDATE REPORT #10: DRAFT PROPOSED TERMS OF REFERENCE**

RECOMMENDATION

That, on the recommendation of the Director, Environment, Fleet and Solid Waste, this report **BE RECEIVED** for information.

PREVIOUS REPORTS PERTINENT TO THIS MATTER

Relevant reports that can be found at www.london.ca under City Hall (Meetings) include:

- Draft Proposed Terms of Reference – Environmental Assessment of the Proposed W12A Landfill Expansion Site (April 17, 2018 meeting of the Civic Works Committee (CWC), Item #3.3)
- Appointment of Consulting Engineer for Various Technical Studies as part of the Environmental Assessment Process for the Proposed Expansion of the W12A Landfill Site (July 17, 2017 meeting of the CWC, Item #6)
- Update and Next Steps – Resource Recovery Strategy and Residual Waste Disposal Strategy as part of the Environmental Assessment Process (February 7, 2017 meeting of the CWC, Item #10)

Relevant reports that can be found at www.london.ca under City Hall (Meetings – Advisory and other Committees) include:

- Preliminary Proposed Draft Terms of Reference (March 8, 2018 meeting of the Waste Management Working Group (WMWG), Item #2.1)
- Terms of Reference Outline and Next Steps (January 18, 2018 meeting of the WMWG, Item #9)
- General Framework for the Community Engagement Program for the Resource Recovery and Residual Waste Disposal Strategies as part of the Environmental Assessment Process (January 19, 2017 meeting of the WMWG, Item #7)

COUNCIL'S 2015-2019 STRATEGIC PLAN

Municipal Council has recognized the importance of solid waste management in its 2015-2019 - Strategic Plan for the City of London (2015 – 2019 Strategic Plan) as follows:

Building a Sustainable City
- Strong and healthy environment
- Robust infrastructure

Growing our Economy
- Local, regional, and global innovation
- Strategic, collaborative partnerships

Leading in Public Service
- Proactive financial management
- Innovative & supportive organizational practices
- Collaborative, engaged leadership
- Excellent service delivery

BACKGROUND

PURPOSE:

This report provides the Waste Management Working Group (WMWG) with an update on status of the Proposed Draft Terms of Reference. This report notes that there has been a delay in receiving comments from several government review agencies.

CONTEXT:

An Environmental Assessment (EA) under the EA Act is a planning study that assesses environmental effects and advantages and disadvantages of a proposed project. The environment is considered in broad terms to include the natural, social, cultural and economic aspects of the environment.

The first phase of the Individual EA process, used for large-scale projects like landfill sites, is the development and approval of a Terms of Reference (ToR) by the Minister. The ToR becomes the framework or work plan for the preparation and review of the individual EA. The ToR allows the proponent to produce an EA that is more direct and easier to be reviewed by interested persons.

The second phase of the individual EA process is completion and approval of an EA. The proponent completes the EA in accordance with the approved ToR.

DISCUSSION

ToR Development Process
The development process for the ToR summarized in Table 1. It is noted that the ToR has a different title depending how far along it is in the approval process.

Table 1 - ToR Development and Tentative Schedule

Development Step		Tentative Schedule
Initial Community Engagement	Seek feedback from the Government Review Team (GRT), public, Indigenous communities and other stakeholders.	Completed January 2018
Preliminary Draft Proposed ToR	An early draft of the Draft Proposed ToR. The MOECC does a preliminary screening of the Preliminary Draft Proposed ToR to ensure all documentation requirements have been met. Preliminary Draft Proposed ToR is revised to address comments.	Completed March 2018
Draft Proposed ToR	**The Draft Proposed ToR is submitted to the GRT, public, Indigenous communities and other stakeholders for review and comment.** **Draft Proposed ToR is revised to address comments.**	**In Progress (see details on next page)**
Proposed ToR	Public participation meeting and Council approval of Proposed ToR. Formal submission of Proposed ToR to the MOECC for approval. The MOECC may ask for revisions to the Proposed ToR to address concerns prior to MOECC staff submitting the Proposed ToR to the Minister for approval.	Late Summer to Fall 2018
(Final) ToR	ToR as approved by the Minister of Environment, Conservation and Parks (formerly Minister of Environment and Climate Change). EA must be carried out according to the ToR.	Early 2019 to Spring 2019

Draft Proposed ToR
The Draft Proposed ToR was submitted to the GRT (18 ministries and agencies), Indigenous communities (8 communities), public and other stakeholders (5 groups) for review and comment for a 45 day review period (April 26, 2018 to June 8, 2018). Comments from some GRT members were not received until June 20, 2018 as they requested more time to finalize their comments.

The City received comments from five members of the GRT and one member of the public. It was expected that most organizations would not have comments given the previous opportunities to provide feedback. Key comments received asked for refinements to the Draft Proposed ToR including providing:

- more details or clarification on what would be included in some of the technical studies;
- more explanation and justification on how the W12A Landfill Area Study was used to determine that expansion of the W12A Landfill was the preferred alternative for the disposal of waste;
- additional details and justification on the proposed expansion of the landfill's service area; and,
- more details on the calculation of residual waste quantities used in estimating the required capacity for an expanded landfill.

It is expected that the Proposed ToR will be able to be finalized and presented to the WMWG in mid-August. The Proposed ToR would then go to a Public Participation meeting on September 25, 2018 Civic Works Committee meeting and approved for submission to the Ministry of Environment, Conservation and Parks (formerly Ministry of the Environment and Climate Change) at the October 2 Council meeting.

It is worth noting that City staff due not anticipate that these delays have any major consequence to having the landfill expansion approved and constructed prior to the current approved capacity being consumed. These initial delays may add three to six months to the overall EA process meaning a revised completion date in 2021.

ACKNOWLEDGEMENTS

This report was prepared with assistance from Mike Losee, Division Manager, Solid Waste Management and Jane Kittmer, Solid Waste Planning Coordinator.

PREPARED BY:	
WESLEY ABBOTT, P. ENG. **PROJECT MANAGER** **SOLID WASTE MANAGEMENT**	
PREPARED AND RECOMMENDED BY:	**CONCURRED BY:**
JAY STANFORD, M.A., M.P.A. **DIRECTOR, ENVIRONMENT, FLEET & SOLID WASTE**	**KELLY SCHERR, P.ENG., MBA, FEC** **MANAGING DIRECTOR, ENVIRONMENTAL & ENGINEERING SERVICES & CITY ENGINEER**