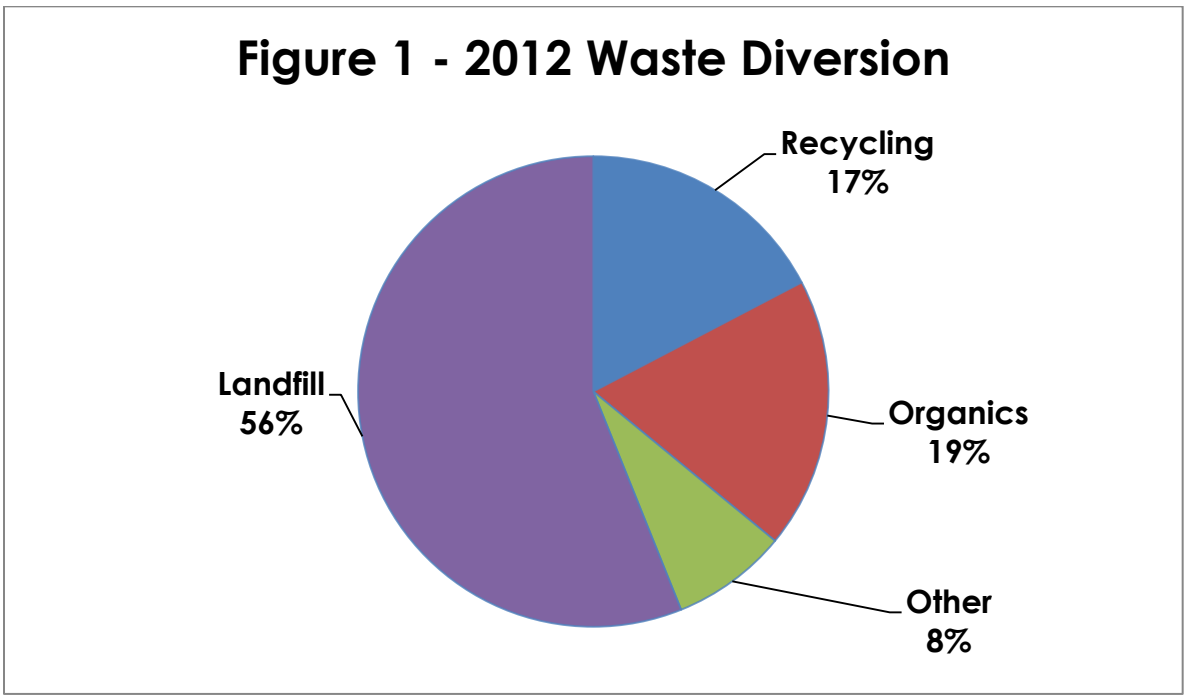
# Appendix A
# Existing Waste Diversion Program Data

A description of the City's various waste diversion programs and the quantity of material diverted by each program in 2012 is provided below. These data are summarized in Table A-1 and Figure A-1.

**Table A-1: 2012 CITY OF LONDON RESIDENTIAL WASTE MANAGEMENT PROGRAMS – ESTIMATED TONNES DIVERTED**

| PROGRAMS | Single Family Households | Multi-Residential Households | Total Tonnes |
|---|---|---|---|
| *Recycling* | | | |
| a) Curbside Recycling Program | 22,960 | 0 | 22,960 |
| b) Multi-Residential Recycling Program | 0 | 3,290 | 3,290 |
| c) City Depots (EnviroDepots, W12A) | 260 | 110 | 370 |
| d) Public Space Recycling (est.) | 30 | 20 | 50 |
| Subtotal | 23,250 | 3,420 | 26,680 |
| *Organics Management* | | | |
| e) Home Composting Program (estimate) | 5,460 | 0 | 5,460 |
| f) Grasscycling (estimate) | 3,950 | 0 | 3,950 |
| g) Curbside Yard Material Collection | 4,540 | 0 | 4,540 |
| h) Depot Yard Material Collection | 9,920 | 0 | 9,920 |
| i) Fall Leaf Collection | 4,680 | 0 | 4,680 |
| j) Christmas Tree Recycling | 100 | 20 | 120 |
| Subtotal | 28,650 | 20 | 28,670 |
| *Other Programs* | | | |
| k) Waste Electronics & Electrical Equipment | 1,030 | 270 | 1,300 |
| l) Tire Recycling | 2,200 | 550 | 2,750 |
| m) Wood Waste/ Construction & Demolition Waste | 4,540 | 0 | 4,540 |
| n) Scrap Metal | 650 | 70 | 720 |
| o) Textile/Small Household Item Reuse | 320 | 80 | 400 |
| p) Municipal Household Special Waste | 330 | 80 | 410 |
| q) Brewers Retail Container Recycling | 1,710 | 430 | 2,140 |
| Subtotal | 10,780 | 1,480 | 12,260 |
| **Total Waste Diverted** | **62,680** | **4,920** | **67,600** |
| **Total Waste Delivered Directly to Landfill** | **60,310** | **22,900** | ***83,210*** |
| **Residual Waste Delivered to Landfill** | **2,680** | **180** | ***2,860*** |
| **Total Waste Disposed** | **62,990** | **23,080** | ***86,070*** |
| **Total Waste** | **125,670** | **28,000** | ***153,670*** |
| **Diversion Rate** | **50%** | **18%** | **44%** |




## Blue Box Recycling Programs

**Curbside Recycling – 22,960 tonnes**

The City collects a wide range of recyclables from all curbside households. The materials collected in 2012 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& tubs; milk & juice cartons; drink boxes & cardboard cans. Plastic plant pots/trays and large plastic pails were added to the program in 2013.

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 form other City programs and other municipalities. Material is weighed upon entering and leaving the MRF.

Approximately 99% of incoming recyclable materials (or 96% of the total incoming material) was shipped to end markets in 2012. 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.

**Multi-Residential Recycling – 3,290 tonnes**

The City collects recyclables from multi-residential buildings at no cost.

The property owner is responsible for purchasing and providing 95 gallon carts for residents to place their recyclables in. As a result, a few multi-residential buildings do not have recycling because the property owner has not provided carts. In 2012, 47,870 multi-residential units had access to on-site recycling and 3,830 units did not. Residents from buildings without on-site recycling must take their recyclables to one of three City EnviroDepots. City staff have made numerous attempts to further reduce the number of units without on-site access to recycling. Enforcement for this service lies with the Ministry of the Environment.

The materials collected, how they are processed and calculation of the quantity recycled is the same as the curbside Blue Box program.

**Depot Recycling – 370 tonnes**

As noted above, the City operates three EnviroDepots (Oxford Street, 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.

**Public Space Recycling – 50 tonnes**

The City has 42 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– 5,460 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 54,600 composters including 240 in 2012. 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.

**Grasscycling – 5,460 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.

It is estimated that not collecting grass diverts on average approximately 45 kilograms of grass per curbside household.

**Curbside Yard Material Collection – 4,540 tonnes**

The City provides curbside collection of yard materials. This includes plant trimmings, brush and branches up to 10 cm in diameter. In 2012 yard materials were collected on a six week cycle and each home received four 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 2012 4,540 tonnes of yard materials were collected curbside of which approximately 200 tonnes would become process residuals.

**Curbside Fall Leaf Collection – 4,680 tonnes**

The City provides curbside collection of fall leaves beginning in mid-October. Yard materials are also collected with the fall leaves. In 2012 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. On average about 5% of incoming material becomes residue. How they are processed and the calculation of the quantity composted is the same as for yard materials.

**Depot Yard Material Collection – 9,920 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. How they are processed and the calculation of the quantity composted is the same as for yard materials.

**Depot Christmas Tree Collection – 120 tones**

The City operates depots at six locations to collect Christmas trees for the 1st week of January each year. The trees are chipped on-site at the Depot locations and taken to TRY Recycling where they are chipped and composted and to W12A Landfill where they are chipped and used for daily cover.

## Other Programs

**Waste Electronics and Electrical Equipment Recycling – 1,130 tonnes**

Waste Electronics and Electrical Equipment (WEEE) recycling is made up of three components. The first component is electronics collected at the EnviroDepots and shipped for recycling. In 2012 the EnviroDepots collected 560 tonnes of material electronics were shipped through the Ontario Electronic Stewardship (OES) program.

The second component is appliances collected at the EnviroDepots and recycled. 2012, 100 tonnes of appliances were collected and recycled.

The third component was the amount of appliances taken to local scrap metal dealers because they are no longer collected at the curb. It was estimated there were an additional 640 tonnes of material diverted because of the ban on appliances.

**Tire Recycling – 2,300 tonnes**

The annual Municipal Datacall administered by Waste Diversion Ontario (WDO) compiles information on materials diverted and disposed by Ontario municipalities. Most of the information used by the WDO 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 2012 WDO Datacall shows 2,300 tonnes of tires being recycled/reused in the City of London. Included in this total is called 120 tonnes of tires collected at the three City EnviroDepots as part of the Used Tire Program.

**Wood, Renovation Material & Construction/Demolition Material Recycling – 4,540 tonnes**

The City banned the collection of wood waste, renovation materials and construction/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 were approximately 80% is made into useable products and 20% becomes residual and is landfilled.

In 2012, the EnviroDepots received 4,240 tonnes of wood waste and renovation materials. Approximately 3,390 tonnes of this material was recycled and 850 tonnes became residual waste and was landfilled.

It was assumed that approximately ½ the residential renovation materials not taken to an EnviroDepots (1,150 tonnes) was taken to a private construction and demolition waste recycling companies (TRY Recycling and Green Valley Recycling) and recycled while other 50% (1,150 tonnes) was placed in the garbage or disposed of privately.

**Scrap Metal Recycling – 720 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 percent of the metal is recycled. In 2012, the EnviroDepots received 500 tonnes of scrap metal.

It was assumed that approximately half the residential renovation materials not taken to an EnviroDepots (220 tonnes) was taken to other scrap metal dealers and recycled while other 50% (220 tonnes) was placed in the garbage.

**Textile/Small Household Item Reuse/Recycling– 400 tonnes**

In 2012, 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 400 tonnes of material at these locations.

**MHSW Recycling– 410 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– 1,710 tonnes**

The 2012 WDO Datacall shows 1,710 tonnes of Brewer's Retail and Liquor Control Board of Ontario (LCBO) containers being recycled/reused in the City of London. This information is provided to the WDO from Brewer's Retail.

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# Appendix B
# Garbage and Blue Box Composition Data

**Existing Composition – Garbage (including compostables) and Blue Box Recyclables**

Composition audits of garbage and Blue Box recyclables were conducted in London in 2012/2013 (with funding, coordination and sampling methodology provided by Stewardship Ontario). The audit consisted of four separate sets of audits conducted at specified intervals throughout the year (i.e. spring, summer, fall, winter) to address any issues of seasonality. Each audit included two samples taken over two consecutive collections to address issues of sporadic set out. The audit sample consisted of 100 curbside homes to achieve statistical significance. The same homes were used 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 2007, etc.) to create the following tables:

- Table B1 – Summary of 2012 Garbage Composition
- Table B2 – Estimated 2012 Curbside Garbage and Recycling Composition
- Table B3 – Estimated 2012 Multi-Residential Garbage and Recycling Composition
- Table B4 – Estimated 2012 Garbage and Recycling Composition

**Future Composition - Waste (Garbage and Blue Box Materials Combined)**

Estimates of waste quantities (garbage and blue box materials combined) were calculated for 2012, 2016 and 2025 and are shown in tables:

- Table B5 – Estimated 2012 Curbside and Multi-Residential Waste Composition
- Table B6 – Estimated 2016 Curbside and Multi-Residential Waste Composition
- Table B7 – Estimated 2025 Curbside and Multi-Residential Waste Composition

These estimates were made taking the 2012 waste composition and adjusting it based on:

- estimates of future curbside (single family dwellings) and multi-residential units from *Employment, Population, Housing and Non-Residential Construction Projects, City of London, Ontario, 2011 Update* (AltusGroup, 2012)
- expected changes to the generation rate of specific materials using information on projected changes to the generation rates from *Volume 1: Executive Summary A Study of the Optimization of the Blue Box Material Processing System in Ontario Final Report* (Waste Diversion Organization, 2012) (Table B8)

The changes to material generation rates in Table B7 are due to industry introducing new packaging or modifying existing packaging, changing consumer habits and new products being introduced. Examples of recent changes include:

- More fruits and vegetables in "clamshell" packaging
- An increase in light weight and multi material packaging
- Plastic containers replacing glass, aluminum and steel
- An increase in plastic stand-up pouches for food products
- Consumers reading more newspapers and magazines online which reduces the amount of paper for recycling
- An increase in cardboard as more people shop online

**Future Composition – Garbage and Blue Box Materials**

Projections of the amount of material that would be diverted by the Blue Box program in the future were estimated for three scenarios:

- Table B9 – Estimated 2016 Garbage and Blue Box Composition – Base Case
- Table B10 – Estimated 2025 Garbage and Blue Box Composition – Base Case
- Table B11 – Estimated 2025 Garbage and Blue Box Composition – High Increase in Capture Rate

The composition in Table B9 is based on the implementation of the recommendations in this report. The composition in Table B10 assumes the increased capture rates continues in line with trends from previous years, but there are no substantially new or different initiatives to increase recovery. It is assumed that markets for some materials will strengthen based on current efforts. The composition in Table B11 assumes recovery rates are substantial and will require aggressive promotion, education and incentive programs (e.g., rewards programs for recycling).

The capture rates used to generate Tables B9 to B11 are presented in Table B12.

## Table B1: Summary of 2012 Garbage Composition

| Material Category | 2012 | | | | | |
|---|---|---|---|---|---|---|
| | Curbside (Single Family Dwellings) | | Multi-Residential | | Total | |
| | Total tonne/yr | % Blue Box Capture[a] | Total tonne/yr | % Blue Box Capture[a] | Total tonne/yr | % Blue Box Capture |
| ***Blue Box Recyclables*** | | | | | | |
| Paper | 3,853 | 83% | 3,510 | 42% | 7,363 | 74% |
| Plastic | 997 | 67% | 657 | 30% | 1,654 | 58% |
| Metal | 652 | 66% | 460 | 26% | 1,112 | 57% |
| Glass | 509 | 81% | 436 | 35% | 945 | 71% |
| *Total Blue Box Recyclables* | 6,011 | 80% | 5,063 | 39% | 11,074 | 71% |
| ***Other Potential Blue Box Materials*** | | | | | | |
| Beverage Cups/Ice Cream Containers | 352 | | 121 | | 473 | |
| Expanded Polystyrene | 256 | | 83 | | 339 | |
| Plastic Bags/Film | 2,388 | | 773 | | 3,161 | |
| *Total Other Potential Blue Box* | 2,996 | | 977 | | 3,973 | |
| ***Other*** | | | | | | |
| Municial Hazardous & Special Waste | 254 | | 46 | | 300 | |
| Food Waste | 22,065 | | 6,919 | | 28,983 | |
| Yard Waste | 1,193 | | 312 | | 1,504 | |
| Textiles | 1,842 | | 818 | | 2,660 | |
| Construction & Demolition | 1,899 | | 843 | | 2,742 | |
| Carpeting | 958 | | 426 | | 1,384 | |
| Electronics | 648 | | 288 | | 935 | |
| Other Non-recyclable Materials | 19,784 | | 7,209 | | 26,993 | |
| *Total Other* | 48,643 | | 16,860 | | 65,503 | |
| ***Grand Total*** | 57,650 | | 22,900 | | 80,550 | |

**Notes**

(a) Percentage of material that is not in the garbage (placed in Blue Box).

## Table B2: Estimated 2012 Curbside Garbage and Recycling Composition

| Material Category | Materials Accepted in London's Blue Box Program | Estimated Curbside Composition (Excludes Bulky Items) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 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 | 7,228 | 359 | 7,587 | 95% | 62 | 3 | 65 |
| Magazines and Catalogues | X | 2,492 | 172 | 2,664 | 94% | 21 | 1 | 23 |
| Directories / Telephone Books | X | 138 | 30 | 167 | 82% | 1 | 0.3 | 1.4 |
| Mixed Fine Paper | X | 1,187 | 1,189 | 2,376 | 50% | 10 | 10 | 20 |
| Books | X | 438 | 145 | 583 | 75% | 4 | 1 | 5 |
| Other Printed Materials - Non-Recycable | | 133 | 324 | 457 | 29% | 1 | 3 | 4 |
| **Total Paper** | | **11,614** | **2,220** | **13,834** | **84%** | **99** | **19** | **118** |
| **Targeted BB Paper** | | **11,481** | **1,895** | **13,377** | **86%** | **98** | **16** | **114** |
| **2. PAPER PACKAGING** | | | | | | | | |
| Gable Top Containers | X | 248 | 83 | 331 | 75% | 2 | 0.7 | 3 |
| Aseptic Containers | X | 83 | 67 | 150 | 55% | 0.7 | 0.6 | 1.3 |
| Spiral Wound Containers | X | 53 | 68 | 121 | 44% | 0.5 | 0.6 | 1.0 |
| Corrugated Cardboard | X | 3,821 | 616 | 4,437 | 86% | 33 | 5 | 38 |
| Boxboard / Cores (Tubes) | X | 2,655 | 1,125 | 3,780 | 70% | 23 | 10 | 32 |
| Polycoat Cups/Ice Cream Containers | | 52 | 299 | 351 | 15% | 0.4 | 3 | 3 |
| Other Bleached Long Polycoat Fibre | | 3 | 53 | 57 | 6% | 0.0 | 0.5 | 0.5 |
| Other Paper Laminate Categories - Non-Recyclable | | 25 | 318 | 343 | 7% | 0.2 | 3 | 3 |
| Tissue/Toweling - Non-Recyclable | | 13 | 3,205 | 3,218 | 0% | 0.1 | 27 | 27 |
| **Total Paper Packaging** | | **6,954** | **5,833** | **12,787** | **54%** | **59** | **50** | **109** |
| **Targeted BB Paper Packaging** | | **6,860** | **1,958** | **8,818** | **78%** | **58** | **17** | **75** |
| **3. PLASTICS** | | | | | | | | |
| #1 PET | X | 1,269 | 397 | 1,666 | 76% | 11 | 3 | 14 |
| #2 HDPE | X | 460 | 159 | 620 | 74% | 4 | 1 | 5 |
| #3 - #7 Mixed Plastics | X | 306 | 408 | 714 | 43% | 3 | 3 | 6 |
| #6 PS - Expanded Polystyrene | | 19 | 256 | 275 | 7% | 0.2 | 2 | 2 |
| Large HDPE & PP Pails & Lids | X | 11 | 33 | 44 | 25% | 0.1 | 0.3 | 0.4 |
| LDPE/HDPE Film | | 141 | 2,388 | 2,529 | 6% | 1 | 20 | 22 |
| Plastic Laminates - Mostly Non-Recyclable | | 31 | 946 | 977 | 3% | 0.3 | 8 | 8 |
| Other Rigid Plastic Packaging - Mostly Non-Recyclable | | 171 | 575 | 746 | 23% | 1 | 5 | 6 |
| Other Plastics - Non-Packaging/Durable - Non-Recyclable | | 149 | 942 | 1,091 | 14% | 1 | 8 | 9 |
| **Total Plastics** | | **2,558** | **6,104** | **8,662** | **30%** | **22** | **52** | **74** |
| **Targeted BB Plastics** | | **2,046** | **997** | **3,043** | **67%** | **17** | **8** | **26** |

**Table B2: Estimated 2012 Curbside Garbage and Recycling Composition (continued)**

| Material Category | Materials Accepted in London's Blue Box Program | Estimated Curbside Composition (Excludes Bulky Items) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 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 |
| **4. METALS** | | | | | | | | |
| Aluminum- Food/Beverage Containers | X | 430 | 112 | 542 | 79% | 4 | 1 | 5 |
| Aluminum - Foil and Trays | X | 26 | 165 | 191 | 14% | 0.2 | 1.4 | 1.6 |
| Steel - Food and Beverage Containers | X | 760 | 222 | 981 | 77% | 6 | 2 | 8 |
| Steel/Aluminum - Aerosol Containers (Non-MHSW) | X | 26 | 109 | 134 | 19% | 0.2 | 0.9 | 1.1 |
| Other Aluminum - Non-Blue Box | | 0.0 | 11 | 11 | 0% | 0.0 | 0.1 | 0.1 |
| Other Steel - Non-Blue Box | | 37 | 457 | 493 | 7% | 0.3 | 4 | 4 |
| **Total Metals** | | **1,278** | **1,075** | **2,353** | **54%** | **11** | **9** | **20** |
| **Targeted BB Metals** | | **1,242** | **608** | **1,849** | **67%** | **11** | **5** | **16** |
| **5. GLASS** | | | | | | | | |
| Clear Glass | X | 1,591 | 469 | 2,060 | 77% | 14 | 4 | 18 |
| Coloured Glass | X | 518 | 40 | 557 | 93% | 4 | 0.3 | 5 |
| Other Glass - Non-Blue Box | | 128 | 335 | 463 | 28% | 1 | 3 | 4 |
| **Total Glass** | | **2,236** | **844** | **3,080** | **73%** | **19** | **7** | **26** |
| **Targeted BB Glass** | | **2,109** | **509** | **2,618** | **81%** | **18** | **4** | **22** |
| **6. MUNICIPAL HAZARDOUS AND SPECIAL WASTE** | | | | | | | | |
| Paint & Stain Containers | X | 10 | 44 | 55 | 19% | 0.1 | 0.4 | 0.5 |
| Lubricating Oil Containers | | 5 | 7 | 11 | 40% | 0.0 | 0.1 | 0.1 |
| Batteries | | 2 | 106 | 108 | 2% | 0.0 | 0.9 | 0.9 |
| Other MHSW | | 30 | 101 | 131 | 23% | 0.3 | 0.9 | 1.1 |
| **Total MHSW** | | **47** | **258** | **305** | **15%** | **0.4** | **2** | **3** |
| **Targeted BB MHSW** | | **10** | **44** | **55** | **19%** | **0.1** | **0.4** | **0.5** |
| **7. OTHER MATERIALS** | | | | | | | | |
| Food Waste | | 0.0 | 22,065 | 22,065 | 0% | 0.0 | 188 | 188 |
| Yard Waste | | 0.0 | 1,193 | 1,193 | 0% | 0.0 | 10 | 10 |
| Diapers & Sanitary Products | | 0.0 | 3,492 | 3,492 | 0% | 0.0 | 30 | 30 |
| Textiles | | 0.0 | 1,842 | 1,842 | 0% | 0.0 | 16 | 16 |
| C&D | | 0.0 | 1,899 | 1,899 | 0% | 0.0 | 16 | 16 |
| Carpeting | | 0.0 | 958 | 958 | 0% | 0.0 | 8 | 8 |
| Electronics | | 0.0 | 648 | 648 | 0% | 0.0 | 6 | 6 |
| Other HSW | | 0.0 | 40 | 40 | 0% | 0.0 | 0.3 | 0.3 |
| Other Non-Recyclable Materials | | 313 | 9,180 | 9,493 | 3% | 3 | 78 | 81 |
| **Total Other Materials** | | **313** | **41,316** | **41,629** | **1%** | **2.7** | **352** | **355** |
| **Total Targeted BB** | | **23,749** | **6,011** | **29,760** | **80%** | **202** | **51** | **254** |
| **Grand Total** | | **25,000** | **57,650** | **82,650** | **30%** | **213** | **491** | **705** |

## Table B3: Estimated 2012 Multi-Residential Garbage and Recycling Composition

| Material Category | Materials Accepted in London's Program | Estimated Multi Residential Composition (excludes bulky items) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | City | | | | | Per Household | | |
| | | Blue Box Material Recycled | Material in Garbage recycling units | Material in Garbage non-recycling units | Total | Capture Rate of Blue Box Materials | Blue Box Material Recycled recycling units | Material in Garbage recycling units | Total |
| | | tonne/yr | tonne/yr | tonne/yr | tonne/yr | | kg/hhld/yr | kg/hhld/yr | kg/hhld/yr |
| **1. PAPER** | | | | | | | | | |
| Newsprint | X | 1,189 | 807 | 134 | 2,130 | 56% | 25 | 17 | 42 |
| Magazines and Catalogues | X | 410 | 291 | 47 | 748 | 55% | 9 | 6 | 15 |
| Directories / Telephone Books | X | 23 | 22 | 3 | 47 | 48% | 0.5 | 0.5 | 1 |
| Mixed Fine Paper | X | 195 | 437 | 43 | 675 | 29% | 4 | 9 | 13 |
| Books | X | 72 | 82 | 10 | 165 | 44% | 1.5 | 1.7 | 3.2 |
| Other Printed Materials - Non-Recycable | | 22 | 100 | 8 | 131 | 17% | 0.5 | 2 | 3 |
| **Total Paper** | | **1,910** | **1,739** | **246** | **3,895** | **49%** | **40** | **37** | **77** |
| **Targeted BB Paper** | | **1,888** | **1,639** | **238** | **3,765** | **50%** | **40** | **35** | **74** |
| **2. PAPER PACKAGING** | | | | | | | | | |
| Gable Top Containers | X | 39 | 89 | 9 | 137 | 29% | 0.8 | 2 | 3 |
| Aseptic Containers | X | 8 | 28 | 2 | 39 | 21% | 0.2 | 0.6 | 0.8 |
| Spiral Wound Containers | X | 6 | 29 | 2 | 38 | 17% | 0.1 | 0.6 | 0.7 |
| Corrugated Cardboard | X | 300 | 557 | 58 | 915 | 33% | 6 | 12 | 18 |
| Boxboard / Cores (Tubes) | X | 313 | 785 | 74 | 1,172 | 27% | 7 | 17 | 23 |
| Polycoat Cups/Ice Cream Containers | | 6 | 97 | 7 | 110 | 6% | 0.1 | 2 | 2 |
| Other Bleached Long Polycoat Fibre | | 0.4 | 16 | 1 | 18 | 2% | 0.0 | 0.3 | 0.4 |
| Other Paper Laminate Categories - Non-Recyclable | | 3 | 98 | 7 | 108 | 3% | 0.1 | 2 | 2 |
| Tissue/Toweling - Non-Recyclable | | 2 | 944 | 64 | 1,009 | 0% | 0.0 | 20 | 20 |
| **Total Paper Packaging** | | **678** | **2,642** | **224** | **3,543** | **19%** | **14** | **56** | **70** |
| **Targeted BB Paper Packaging** | | **667** | **1,488** | **145** | **2,300** | **29%** | **14** | **31** | **45** |
| **3. PLASTICS** | | | | | | | | | |
| #1 PET | X | 177 | 306 | 32 | 515 | 34% | 4 | 6 | 10 |
| #2 HDPE | X | 64 | 115 | 12 | 192 | 33% | 1 | 2 | 4 |
| #3 - #7 Mixed Plastics | X | 43 | 165 | 14 | 222 | 19% | 1 | 3 | 4 |
| #6 PS - Expanded Polystyrene | | 3 | 78 | 5 | 86 | 3% | 0.1 | 2 | 2 |
| Large HDPE & PP Pails & Lids | X | 2 | 11 | 1 | 14 | 11% | 0.0 | 0.2 | 0.3 |
| LDPE/HDPE Film | | 20 | 723 | 50 | 792 | 2% | 0.4 | 15 | 16 |
| Plastic Laminates - Mostly Non-Recyclable | | 4 | 283 | 19 | 306 | 1% | 0.1 | 6 | 6 |
| Other Rigid Plastic Packaging - Mostly Non-Recyclable | | 24 | 195 | 15 | 233 | 10% | 0.5 | 4 | 5 |
| Other Plastics - Non-Packaging/Durable - Non-Recyclable | | 21 | 299 | 22 | 341 | 6% | 0.4 | 6 | 7 |
| **Total Plastics** | | **356** | **2,174** | **170** | **2,701** | **13%** | **7** | **46** | **53** |
| **Targeted BB Plastics** | | **285** | **598** | **59** | **942** | **30%** | **6** | **13** | **19** |

## Table B3: Estimated 2012 Multi-Residential Garbage and Recycling Composition (continued)

| Material Category | Materials Accepted in London's Program | Estimated Multi Residential Composition (excludes bulky items) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | City | | | | | Per Household | | |
| | | Blue Box Material Recycled | Material in Garbage recycling units | Material in Garbage non-recycling units | Total | Capture Rate of Blue Box Materials | Blue Box Material Recycled recycling units | Material in Garbage recycling units | Total |
| | | tonne/yr | tonne/yr | tonne/yr | tonne/yr | | kg/hhld/yr | kg/hhld/yr | kg/hhld/yr |
| **4. METALS** | | | | | | | | | |
| Aluminum- Food/Beverage Containers | X | 56 | 114 | 11 | 182 | 31% | 1 | 2 | 4 |
| Aluminum - Foil and Trays | X | 3 | 57 | 4 | 65 | 5% | 0.1 | 1.2 | 1.3 |
| Steel - Food and Beverage Containers | X | 100 | 209 | 21 | 329 | 30% | 2 | 4 | 6 |
| Steel/Aluminum - Aerosol Containers (Non-MHSW) | X | 3 | 39 | 3 | 46 | 7% | 0.1 | 0.8 | 0.9 |
| Other Aluminum - Non-Blue Box | | 0.0 | 3.3 | 0.2 | 3.6 | 0% | 0.0 | 0.1 | 0.1 |
| Other Steel - Non-Blue Box | | 4 | 117 | 8 | 129 | 3% | 0.1 | 2 | 3 |
| **Total Metals** | | **167** | **539** | **48** | **754** | **22%** | **4** | **11** | **15** |
| **Targeted BB Metals** | | **163** | **419** | **39** | **621** | **26%** | **3** | **9** | **12** |
| **5. GLASS** | | | | | | | | | |
| Clear Glass | X | 188 | 338 | 35 | 561 | 34% | 4 | 7 | 11 |
| Coloured Glass | X | 43 | 57 | 7 | 106 | 40% | 1 | 1 | 2 |
| Other Glass - Non-Blue Box | | 29 | 197 | 15 | 241 | 12% | 0.6 | 4 | 5 |
| **Total Glass** | | **260** | **591** | **57** | **908** | **29%** | **5** | **12** | **18** |
| **Targeted BB Glass** | | **231** | **394** | **42** | **668** | **35%** | **5** | **8** | **13** |
| **6. MUNICIPAL HAZARDOUS AND SPECIAL WASTE** | | | | | | | | | |
| Paint & Stain Containers | X | 0.2 | 1 | 0.1 | 1 | 17% | 0.0 | 0.0 | 0.0 |
| Lubricating Oil Containers | | 0.5 | 0.8 | 0.1 | 1 | 37% | 0.0 | 0.0 | 0.0 |
| Batteries | | 0.2 | 13 | 1 | 14 | 1% | 0.0 | 0.3 | 0.3 |
| Other MHSW | | 4 | 12 | 1 | 17 | 21% | 0.1 | 0.3 | 0.3 |
| **Total MHSW** | | **5** | **27** | **2** | **34** | **13%** | **0.1** | **1** | **0.7** |
| **Targeted BB MHSW** | | **0.2** | **1** | **0.1** | **1** | **17%** | **0.0** | **0.0** | **0.0** |
| **7. OTHER MATERIALS** | | | | | | | | | |
| Food Waste | | 0.0 | 6,482 | 437 | 6,919 | 0% | 0.0 | 136 | 136 |
| Yard Waste | | 0.0 | 292 | 20 | 312 | 0% | 0.0 | 6 | 6 |
| Diapers & Sanitary Products | | 0.0 | 684 | 46 | 730 | 0% | 0.0 | 14 | 14 |
| Textiles | | 0.0 | 767 | 52 | 818 | 0% | 0.0 | 16 | 16 |
| C&D | | 0.0 | 790 | 53 | 843 | 0% | 0.0 | 17 | 17 |
| Carpeting | | 0.0 | 399 | 27 | 426 | 0% | 0.0 | 8 | 8 |
| Electronics | | 0.0 | 270 | 18 | 288 | 0% | 0.0 | 6 | 6 |
| Other HSW | | 0.0 | 17 | 1 | 18 | 0% | 0.0 | 0.3 | 0.3 |
| Other Non-Recyclable Materials | | 125 | 3,820 | 266 | 4,211 | 3% | 3 | 80 | 83 |
| **Total Other Materials** | | **125** | **13,520** | **919** | **14,565** | **1%** | **0.0** | **198** | **198** |
| **Total Targeted BB** | | **3,234** | **4,539** | **524** | **8,297** | **39%** | **68** | **96** | **164** |
| **Grand Total** | | **3,500** | **21,234** | **1,666** | **26,400** | **13%** | **71** | **361** | **432** |

## Table B4: Estimated 2012 Garbage and Recycling Composition

| Material Category | Materials Accepted in London's Program | Estimated Overall Composition (Excludes Bulky Items) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 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 | 8,416 | 1,301 | 9,717 | 87% | 50 | 8 | 58 |
| Magazines and Catalogues | X | 2,902 | 510 | 3,412 | 85% | 17 | 3 | 20 |
| Directories / Telephone Books | X | 160 | 54 | 214 | 75% | 1 | 0.3 | 1.3 |
| Mixed Fine Paper | X | 1,382 | 1,669 | 3,051 | 45% | 8 | 10 | 18 |
| Books | X | 510 | 238 | 748 | 68% | 3 | 1 | 4 |
| Other Printed Materials - Non-Recycable | | 155 | 433 | 588 | 26% | 0.9 | 3 | 3 |
| **Total Paper** | | **13,525** | **4,205** | **17,729** | **76%** | **81** | **25** | **106** |
| **Targeted BB Paper** | | **13,370** | **3,772** | **17,141** | **78%** | **80** | **22** | **102** |
| **2. PAPER PACKAGING** | | | | | | | | |
| Gable Top Containers | X | 287 | 180 | 467 | 61% | 2 | 1 | 3 |
| Aseptic Containers | X | 90 | 97 | 187 | 48% | 0.5 | 0.6 | 1.1 |
| Spiral Wound Containers | X | 59 | 99 | 159 | 37% | 0.4 | 0.6 | 0.9 |
| Corrugated Cardboard | X | 4,122 | 1,231 | 5,352 | 77% | 25 | 7 | 32 |
| Boxboard / Cores (Tubes) | X | 2,968 | 1,983 | 4,952 | 60% | 18 | 12 | 29 |
| Polycoat Cups/Ice Cream Containers | | 58 | 402 | 461 | 13% | 0.3 | 2.4 | 3 |
| Other Bleached Long Polycoat Fibre | | 4 | 71 | 74 | 5% | 0.0 | 0.4 | 0.4 |
| Other Paper Laminate Categories - Non-Recyclable | | 28 | 423 | 451 | 6% | 0.2 | 3 | 3 |
| Tissue/Toweling - Non-Recyclable | | 14 | 4,212 | 4,226 | 0% | 0.1 | 25 | 25 |
| **Total Paper Packaging** | | **7,631** | **8,698** | **16,330** | **47%** | **45** | **52** | **97** |
| **Targeted BB Paper Packaging** | | **7,526** | **3,591** | **11,117** | **68%** | **45** | **21** | **66** |
| **3. PLASTICS** | | | | | | | | |
| #1 PET | X | 1,446 | 735 | 2,181 | 66% | 9 | 4 | 13 |
| #2 HDPE | X | 524 | 287 | 811 | 65% | 3 | 2 | 5 |
| #3 - #7 Mixed Plastics | X | 348 | 588 | 936 | 37% | 2 | 3 | 6 |
| #6 PS - Expanded Polystyrene | | 22 | 339 | 361 | 6% | 0.1 | 2 | 2 |
| Large HDPE & PP Pails & Lids | X | 12 | 45 | 57 | 22% | 0.1 | 0.3 | 0 |
| LDPE/HDPE Film | | 161 | 3,161 | 3,321 | 5% | 1 | 19 | 20 |
| Plastic Laminates - Mostly Non-Recyclable | | 35 | 1,248 | 1,283 | 3% | 0.2 | 7 | 8 |
| Other Rigid Plastic Packaging - Mostly Non-Recyclable | | 195 | 784 | 980 | 20% | 1 | 5 | 6 |
| Other Plastics - Non-Packaging/Durable - Non-Recyclable | | 169 | 1,262 | 1,432 | 12% | 1 | 8 | 9 |
| **Total Plastics** | | **2,914** | **8,449** | **11,363** | **26%** | **17** | **50** | **68** |
| **Targeted BB Plastics** | | **2,331** | **1,654** | **3,985** | **58%** | **14** | **10** | **24** |

## Table B4: Estimated 2012 Garbage and Recycling Composition (continued)

| Material Category | Materials Accepted in London's Program | Estimated Overall Composition (Excludes Bulky Items) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 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 |
| **4. METALS** | | | | | | | | |
| Aluminum- Food/Beverage Containers | X | 486 | 238 | 724 | 67% | 3 | 1 | 4 |
| Aluminum - Foil and Trays | X | 30 | 226 | 256 | 12% | 0.2 | 1.3 | 1.5 |
| Steel - Food and Beverage Containers | X | 859 | 451 | 1,311 | 66% | 5 | 3 | 8 |
| Steel/Aluminum - Aerosol Containers (Non-MHSW) | X | 29 | 151 | 180 | 16% | 0.2 | 0.9 | 1 |
| Other Aluminum - Non-Blue Box | | 0.0 | 14 | 14 | 0% | 0.0 | 0.1 | 0.1 |
| Other Steel - Non-Blue Box | | 40 | 582 | 622 | 6% | 0.2 | 3 | 4 |
| **Total Metals** | | **1,445** | **1,662** | **3,107** | **47%** | **9** | **10** | **18** |
| **Targeted BB Metals** | | **1,404** | **1,066** | **2,470** | **57%** | **8** | **6** | **15** |
| **5. GLASS** | | | | | | | | |
| Clear Glass | X | 1,779 | 842 | 2,621 | 68% | 11 | 5 | 16 |
| Coloured Glass | X | 561 | 103 | 664 | 84% | 3 | 1 | 4 |
| Other Glass - Non-Blue Box | | 156 | 547 | 703 | 22% | 0.9 | 3 | 4 |
| **Total Glass** | | **2,496** | **1,492** | **3,988** | **63%** | **15** | **9** | **24** |
| **Targeted BB Glass** | | **2,340** | **945** | **3,285** | **71%** | **14** | **6** | **20** |
| **6. MUNICIPAL HAZARDOUS AND SPECIAL WASTE** | | | | | | | | |
| Paint & Stain Containers | X | 11 | 46 | 56 | 19% | 0.1 | 0.3 | 0.3 |
| Lubricating Oil Containers | | 5 | 8 | 13 | 40% | 0.0 | 0.0 | 0.1 |
| Batteries | | 2 | 120 | 122 | 2% | 0.0 | 0.7 | 0.3 |
| Other MHSW | | 33 | 114 | 148 | 23% | 0.2 | 1 | 1 |
| **Total MHSW** | | **51** | **288** | **339** | **15%** | **0.3** | **2** | **2** |
| **Targeted BB MHSW** | | **11** | **46** | **56** | **19%** | **0.1** | **0.3** | **0.3** |
| **7. OTHER MATERIALS** | | | | | | | | |
| Food Waste | | 0.0 | 28,983 | 28,983 | 0% | 0.0 | 173 | 173 |
| Yard Waste | | 0.0 | 1,504 | 1,504 | 0% | 0.0 | 9 | 9 |
| Diapers & Sanitary Products | | 0.0 | 4,222 | 4,222 | 0% | 0.0 | 25 | 25 |
| Textiles | | 0.0 | 2,660 | 2,660 | 0% | 0.0 | 16 | 16 |
| C&D | | 0.0 | 2,742 | 2,742 | 0% | 0.0 | 16 | 16 |
| Carpeting | | 0.0 | 1,384 | 1,384 | 0% | 0.0 | 8 | 8 |
| Electronics | | 0.0 | 935 | 935 | 0% | 0.0 | 6 | 6 |
| Other HSW | | 0.0 | 58 | 58 | 0% | 0.0 | 0.3 | 0.3 |
| Other Non-Recyclable Materials | | 439 | 13,266 | 13,705 | 3% | 3 | 79 | 82 |
| **Total Other Materials** | | **439** | **55,756** | **56,195** | **1%** | **0.0** | **247** | **247** |
| **Total Targeted BB** | | **26,982** | **11,074** | **38,056** | **71%** | **161** | **66** | **227** |
| **Grand Total** | | **28,500** | **80,550** | **109,050** | **26%** | **167** | **395** | **561** |

## Table B5: Estimated 2012 Curbside and Multi-Residential Waste Composition

| Material Category | Materials Accepted in London's Program | Estimated Composition (excludes bulky items) | | | | | |
|---|---|---|---|---|---|---|---|
| | | City | | | Per Household | | |
| | | Curbside tonne/yr | Multi-Res tonne/yr | Total tonne/yr | Curbside kg/hhld/yr | Multi-Res kg/hhld/yr | Average kg/hhld/yr |
| **1. PAPER** | | | | | | | |
| Newsprint | X | 7,587 | 2,130 | 9,717 | 65 | 42 | 58 |
| Magazines and Catalogues | X | 2,664 | 748 | 3,412 | 23 | 15 | 20 |
| Directories / Telephone Books | X | 167 | 47 | 214 | 1.4 | 0.9 | 1.2 |
| Mixed Fine Paper | X | 2,376 | 675 | 3,051 | 20 | 13 | 18 |
| Books | X | 583 | 165 | 748 | 5 | 3 | 4 |
| Other Printed Materials[a] | | 457 | 131 | 588 | 4 | 3 | 3 |
| **Total Paper** | | **13,834** | **3,895** | **17,729** | **118** | **77** | **105** |
| **Targeted BB Paper** | | **13,377** | **3,765** | **17,141** | **114** | **74** | **102** |
| **2. PAPER PACKAGING** | | | | | | | |
| Gable Top Containers | X | 331 | 137 | 467 | 3 | 3 | 3 |
| Aseptic Containers | X | 150 | 39 | 188 | 1.3 | 0.8 | 1.0 |
| Spiral Wound Containers | X | 121 | 38 | 159 | 1.0 | 0.7 | 0.9 |
| Corrugated Cardboard | X | 4,437 | 915 | 5,352 | 38 | 18 | 32 |
| Boxboard / Cores (Tubes) | X | 3,780 | 1,172 | 4,952 | 32 | 23 | 29 |
| Polycoat Cups/Ice Cream Containers | | 351 | 110 | 461 | 3 | 2 | 3 |
| Other Bleached Long Polycoat Fibre | | 57 | 18 | 74 | 0.5 | 0.4 | 0.8 |
| Other Paper Laminate Categories[a] | | 343 | 108 | 451 | 3 | 2 | 3 |
| Tissue/Toweling - Non-Recyclable | | 3,218 | 1,009 | 4,226 | 27 | 20 | 25 |
| **Total Paper Packaging** | | **12,787** | **3,543** | **16,330** | **109** | **70** | **97** |
| **Targeted BB Paper Packaging** | | **8,818** | **2,300** | **11,118** | **75** | **45** | **66** |
| **3. PLASTICS** | | | | | | | |
| #1 PET | X | 1,666 | 515 | 2,181 | 14 | 10 | 13 |
| #2 HDPE | X | 620 | 192 | 811 | 5 | 4 | 5 |
| #3 - #7 Mixed Plastics | X | 714 | 222 | 936 | 6 | 4 | 6 |
| #6 PS - Expanded Polystyrene | | 275 | 86 | 361 | 2 | 2 | 2 |
| Large HDPE & PP Pails & Lids | X | 44 | 14 | 57 | 0.4 | 0.3 | 0.3 |
| LDPE/HDPE Film | | 2,529 | 792 | 3,321 | 22 | 16 | 20 |
| Plastic Laminates[a] | | 977 | 306 | 1,283 | 8 | 6 | 8 |
| Other Rigid Plastic Packaging[a] | | 746 | 233 | 980 | 6 | 5 | 6 |
| Other Plastics - Non-Packaging/Durable[a] | | 1,091 | 341 | 1,432 | 9 | 7 | 9 |
| **Total Plastics** | | **8,662** | **2,701** | **11,363** | **74** | **53** | **68** |
| **Targeted BB Plastics** | | **3,043** | **942** | **3,985** | **26** | **19** | **24** |

**Notes**

(a) Mostly non-recyclable material.

**Table B5: Estimated 2012 Curbside and Multi-Residential Waste Composition (continued)**

| Material Category | Materials Accepted in London's Program | Estimated Composition (excludes bulky items) | | | | | |
|---|---|---|---|---|---|---|---|
| | | City | | | Per Household | | |
| | | Curbside tonne/yr | Multi-Res tonne/yr | Total tonne/yr | Curbside kg/hhld/yr | Multi-Res kg/hhld/yr | Average kg/hhld/yr |
| **4. METALS** | | | | | | | |
| Aluminum- Food/Beverage Containers | X | 542 | 182 | 724 | 5 | 4 | 4 |
| Aluminum - Foil and Trays | X | 191 | 65 | 256 | 2 | 1 | 2 |
| Steel - Food and Beverage Containers | X | 981 | 329 | 1,311 | 8 | 6 | 8 |
| Steel/Aluminum - Aerosol Containers | X | 134 | 46 | 180 | 1 | 1 | 1 |
| Other Aluminum - Non-Blue Box | | 10.5 | 3.6 | 14 | 0.1 | 0.1 | 0.1 |
| Other Steel - Non-Blue Box | | 493 | 129 | 622 | 4 | 3 | 4 |
| **Total Metals** | | **2,353** | **754** | **3,107** | **20** | **15** | **18** |
| **Targeted BB Metals** | | **1,849** | **621** | **2,470** | **16** | **12** | **15** |
| **5. GLASS** | | | | | | | |
| Clear Glass | X | 2,060 | 561 | 2,621 | 18 | 11 | 16 |
| Coloured Glass | X | 557 | 106 | 664 | 5 | 2 | 4 |
| Other Glass - Non-Blue Box | | 463 | 241 | 703 | 4 | 5 | 4 |
| **Total Glass** | | **3,080** | **908** | **3,988** | **26** | **18** | **24** |
| **Targeted BB Glass** | | **2,618** | **668** | **3,285** | **22** | **13** | **20** |
| **6. MUNICIPAL HAZARDOUS AND SPECIAL WASTE** | | | | | | | |
| Paint & Stain Containers | X | 55 | 1 | 56 | 0.5 | 0.03 | 0.2 |
| Lubricating Oil Containers | | 11 | 1 | 13 | 0.1 | 0.0 | 0.1 |
| Batteries | | 108 | 14 | 122 | 1 | 0.3 | 1 |
| Other MHSW | | 131 | 17 | 148 | 1 | 0 | 1 |
| **Total MHSW** | | **305** | **34** | **339** | **3** | **1** | **2** |
| **Targeted BB MHSW** | | **55** | **1** | **56** | **0.5** | **0.0** | **0.2** |
| **7. OTHER MATERIALS** | | | | | | | |
| Food Waste | | 22,065 | 6,919 | 28,983 | 188 | 136 | 173 |
| Yard Waste | | 1,193 | 312 | 1,504 | 10 | 6 | 9 |
| Diapers & Sanitary Products | | 3,492 | 730 | 4,222 | 30 | 14 | 25 |
| Textiles | | 1,842 | 818 | 2,660 | 16 | 16 | 16 |
| C&D | | 1,899 | 843 | 2,742 | 16 | 17 | 16 |
| Carpeting | | 958 | 426 | 1,384 | 8 | 8 | 8 |
| Electronics | | 648 | 288 | 935 | 6 | 6 | 6 |
| Other HSW | | 40 | 18 | 58 | 0.3 | 0.3 | 0.3 |
| Other Non-Recyclable Materials | | 9,493 | 4,211 | 13,704 | 81 | 83 | 82 |
| **Total Other Materials** | | **31,449** | **10,048** | **56,194** | **268** | **198** | **247** |
| **Total Targeted BB** | | **29,760** | **8,297** | **38,056** | **254** | **164** | **226** |
| **Grand Total** | | **72,470** | **21,883** | **109,050** | **618** | **432** | **562** |

## Table B6: Estimated 2016 Curbside and Multi-Residential Waste Composition

| Material Category | Materials Accepted in London's Program | Estimated Curbside Composition (excludes bulky items) | | | | | |
|---|---|---|---|---|---|---|---|
| | | City | | | Per Household | | |
| | | Curbside tonne/yr | Multi-Res tonne/yr | Total tonne/yr | Curbside kg/hhld/yr | Multi-Res kg/hhld/yr | Average kg/hhld/yr |
| **1. PAPER** | | | | | | | |
| Newsprint | X | 6,959 | 2,152 | 9,111 | 57 | 37 | 51 |
| Magazines and Catalogues | X | 2,572 | 796 | 3,368 | 21 | 14 | 19 |
| Directories / Telephone Books | X | 135 | 42 | 176 | 1 | 1 | 1 |
| Mixed Fine Paper | X | 2,562 | 801 | 3,363 | 21 | 14 | 19 |
| Books | X | 610 | 190 | 799 | 5 | 3 | 4 |
| Other Printed Materials - Non-Recycable | | 478 | 150 | 629 | 4 | 3 | 3 |
| **Total Paper** | | **13,316** | **4,130** | **17,446** | **109** | **71** | **97** |
| **Targeted BB Paper** | | **12,837** | **3,980** | **16,817** | **105** | **68** | **94** |
| **2. PAPER PACKAGING** | | | | | | | |
| Gable Top Containers | X | 389 | 177 | 565 | 3 | 3 | 3 |
| Aseptic Containers | X | 176 | 50 | 226 | 1 | 1 | 1 |
| Spiral Wound Containers | X | 136 | 47 | 183 | 1 | 1 | 1 |
| Corrugated Cardboard | X | 5,141 | 1,167 | 6,309 | 42 | 20 | 35 |
| Boxboard / Cores (Tubes) | X | 3,954 | 1,350 | 5,304 | 32 | 23 | 29 |
| Polycoat Cups/Ice Cream Containers | | 395 | 136 | 532 | 3 | 2 | 3 |
| Other Bleached Long Polycoat Fibre | | 64 | 22 | 86 | 0.5 | 0.4 | 0.5 |
| Other Paper Laminate Categories - Non-Recyclable | | 387 | 133 | 520 | 3 | 2 | 3 |
| Tissue/Toweling - Non-Recyclable | | 3,366 | 1,162 | 4,528 | 27 | 20 | 25 |
| **Total Paper Packaging** | | **14,007** | **4,244** | **18,251** | **114** | **73** | **102** |
| **Targeted BB Paper Packaging** | | **9,796** | **2,790** | **12,586** | **80** | **48** | **70** |
| **3. PLASTICS** | | | | | | | |
| #1 PET | X | 1,904 | 648 | 2,551 | 16 | 11 | 14 |
| #2 HDPE | X | 628 | 214 | 842 | 5 | 4 | 5 |
| #3 - #7 Mixed Plastics | X | 804 | 275 | 1,079 | 7 | 5 | 6 |
| #6 PS - Expanded Polystyrene | | 244 | 84 | 328 | 2 | 1 | 2 |
| Large HDPE & PP Pails & Lids | X | 46 | 16 | 61 | 0.4 | 0.3 | 0.3 |
| LDPE/HDPE Film | | 2,564 | 884 | 3,449 | 21 | 15 | 19 |
| Plastic Laminates - Mostly Non-Recyclable | | 1,117 | 385 | 1,502 | 9 | 7 | 8 |
| Other Rigid Plastic Packaging - Mostly Non-Recyclable | | 925 | 318 | 1,243 | 8 | 5 | 7 |
| Other Plastics - Non-Packaging/Durable - Non-Recyclable | | 1,141 | 393 | 1,534 | 9 | 7 | 9 |
| **Total Plastics** | | **9,371** | **3,217** | **12,589** | **76** | **55** | **70** |
| **Targeted BB Plastics** | | **3,381** | **1,153** | **4,534** | **28** | **20** | **25** |

**Table B6: Estimated 2016 Curbside and Multi-Residential Waste Composition (continued)**

| Material Category | Materials Accepted in London's Program | Estimated Curbside Composition (excludes bulky items) | | | | | |
|---|---|---|---|---|---|---|---|
| | | City | | | Per Household | | |
| | | Curbside tonne/yr | Multi-Res tonne/yr | Total tonne/yr | Curbside kg/hhld/yr | Multi-Res kg/hhld/yr | Average kg/hhld/yr |
| **4. METALS** | | | | | | | |
| Aluminum- Food/Beverage Containers | X | 550 | 203 | 752 | 4 | 3 | 4 |
| Aluminum - Foil and Trays | X | 194 | 72 | 266 | 2 | 1 | 1 |
| Steel - Food and Beverage Containers | X | 963 | 356 | 1,319 | 8 | 6 | 7 |
| Steel/Aluminum - Aerosol Containers (Non-MHSW) | X | 141 | 52 | 193 | 1 | 1 | 1 |
| Other Aluminum - Non-Blue Box | | 11.0 | 4.1 | 15 | 0.1 | 0.1 | 0.1 |
| Other Steel - Non-Blue Box | | 516 | 148 | 664 | 4 | 3 | 4 |
| **Total Metals** | | **2,375** | **836** | **3,211** | **19** | **14** | **18** |
| **Targeted BB Metals** | | **1,848** | **684** | **2,531** | **15** | **12** | **14** |
| **5. GLASS** | | | | | | | |
| Clear Glass | X | 1,956 | 587 | 2,543 | 16 | 10 | 14 |
| Coloured Glass | X | 529 | 111 | 641 | 4 | 2 | 4 |
| Other Glass - Non-Blue Box | | 484 | 277 | 761 | 4 | 5 | 4 |
| **Total Glass** | | **2,969** | **975** | **3,944** | **24** | **17** | **22** |
| **Targeted BB Glass** | | **2,485** | **698** | **3,183** | **20** | **12** | **18** |
| **6. MUNICIPAL HAZARDOUS AND SPECIAL WASTE** | | | | | | | |
| Paint & Stain Containers | X | 57 | 2 | 59 | 0.5 | 0.03 | 0.3 |
| Lubricating Oil Containers | | 12 | 2 | 14 | 0.1 | 0.0 | 0.1 |
| Batteries | | 113 | 16 | 129 | 1 | 0.3 | 1 |
| Other MHSW | | 137 | 20 | 156 | 1 | 0 | 1 |
| **Total MHSW** | | **319** | **39** | **358** | **3** | **1** | **2** |
| **Targeted BB MHSW** | | **57** | **2** | **59** | **0.5** | **0.0** | **0.3** |
| **7. OTHER MATERIALS** | | | | | | | |
| Food Waste | | 23,080.5 | 7,969 | 31,050 | 188 | 136 | 173 |
| Yard Waste | | 1,248 | 359 | 1,607 | 10 | 6 | 9 |
| Diapers & Sanitary Products | | 3,653 | 841 | 4,493 | 30 | 14 | 25 |
| Textiles | | 1,927 | 943 | 2,870 | 16 | 16 | 16 |
| C&D | | 1,986 | 972 | 2,958 | 16 | 17 | 16 |
| Carpeting | | 1,003 | 490 | 1,493 | 8 | 8 | 8 |
| Electronics | | 678 | 331 | 1,009 | 6 | 6 | 6 |
| Other HSW | | 42 | 20 | 62 | 0.3 | 0.3 | 0.3 |
| Other Non-Recyclable Materials | | 9,930 | 4,851 | 14,781 | 81 | 83 | 82 |
| **Total Other Materials** | | **32,896.6** | **11,574** | **44,470** | **268** | **198** | **247** |
| **Total Targeted BB** | | **30,405** | **9,306** | **39,711** | **248** | **159** | **221** |
| **Grand Total** | | **75,254** | **25,015** | **100,270** | **613** | **428** | **558** |

## Table B7: Estimated 2025 Curbside and Multi-Residential Waste Composition

| Material Category | Materials Accepted in London's Program | Estimated Curbside Composition (excludes bulky items) | | | | | |
|---|---|---|---|---|---|---|---|
| | | City | | | Per Household | | |
| | | Curbside tonne/yr | Multi-Res tonne/yr | Total tonne/yr | Curbside kg/hhld/yr | Multi-Res kg/hhld/yr | Average kg/hhld/yr |
| **1. PAPER** | | | | | | | |
| Newsprint | X | 5,293 | 1,626 | 6,919 | 39 | 25 | 35 |
| Magazines and Catalogues | X | 2,323 | 714 | 3,037 | 17 | 11 | 15 |
| Directories / Telephone Books | X | 49 | 15 | 64 | 0.4 | 0.2 | 0.3 |
| Mixed Fine Paper | X | 3,039 | 944 | 3,983 | 22 | 15 | 20 |
| Books | X | 678 | 209 | 887 | 5 | 3 | 4 |
| Other Printed Materials - Non-Recycable | | 532 | 166 | 698 | 4 | 3 | 3 |
| **Total Paper** | | **11,914** | **3,674** | **15,588** | **87** | **57** | **78** |
| **Targeted BB Paper** | | **11,382** | **3,508** | **14,890** | **83** | **54** | **75** |
| **2. PAPER PACKAGING** | | | | | | | |
| Gable Top Containers | X | 538 | 243 | 782 | 4 | 4 | 4 |
| Aseptic Containers | X | 244 | 69 | 312 | 2 | 1 | 2 |
| Spiral Wound Containers | X | 176 | 60 | 236 | 1 | 1 | 1 |
| Corrugated Cardboard | X | 6,966 | 1,571 | 8,537 | 51 | 24 | 43 |
| Boxboard / Cores (Tubes) | X | 4,395 | 1,491 | 5,886 | 32 | 23 | 29 |
| Polycoat Cups/Ice Cream Containers | | 510 | 175 | 685 | 4 | 3 | 3 |
| Other Bleached Long Polycoat Fibre | | 82 | 28 | 111 | 1 | 0.4 | 1 |
| Other Paper Laminate Categories - Non-Recyclable | | 499 | 171 | 670 | 4 | 3 | 3 |
| Tissue/Toweling - Non-Recyclable | | 3,741 | 1,283 | 5,025 | 27 | 20 | 25 |
| **Total Paper Packaging** | | **17,152** | **5,091** | **22,243** | **126** | **79** | **112** |
| **Targeted BB Paper Packaging** | | **12,319** | **3,434** | **15,753** | **90** | **53** | **79** |
| **3. PLASTICS** | | | | | | | |
| #1 PET | X | 2,519 | 852 | 3,370 | 18 | 13 | 17 |
| #2 HDPE | X | 648 | 219 | 868 | 5 | 3 | 4 |
| #3 - #7 Mixed Plastics | X | 1,036 | 353 | 1,389 | 8 | 5 | 7 |
| #6 PS - Expanded Polystyrene | | 160 | 55 | 215 | 1 | 1 | 1 |
| Large HDPE & PP Pails & Lids | X | 51 | 17 | 68 | 0.4 | 0.3 | 0.3 |
| LDPE/HDPE Film | | 2,647 | 907 | 3,554 | 19 | 14 | 18 |
| Plastic Laminates - Mostly Non-Recyclable | | 1,477 | 506 | 1,984 | 11 | 8 | 10 |
| Other Rigid Plastic Packaging - Mostly Non-Recyclable | | 1,389 | 474 | 1,863 | 10 | 7 | 9 |
| Other Plastics - Non-Packaging/Durable - Non-Recyclable | | 1,268 | 434 | 1,702 | 9 | 7 | 9 |
| **Total Plastics** | | **11,195** | **3,817** | **15,012** | **82** | **59** | **75** |
| **Targeted BB Plastics** | | **4,254** | **1,441** | **5,695** | **31** | **22** | **29** |

**Table B7: Estimated 2025 Curbside and Multi-Residential Waste Composition (continued)**

| Material Category | Materials Accepted in London's Program | Estimated Curbside Composition (excludes bulky items) | | | | | |
|---|---|---|---|---|---|---|---|
| | | City | | | Per Household | | |
| | | Curbside tonne/yr | Multi-Res tonne/yr | Total tonne/yr | Curbside kg/hhld/yr | Multi-Res kg/hhld/yr | Average kg/hhld/yr |
| **4. METALS** | | | | | | | |
| Aluminum - Food/Beverage Containers | X | 567 | 208 | 775 | 4 | 3 | 4 |
| Aluminum - Foil and Trays | X | 200 | 74 | 274 | 1 | 1 | 1 |
| Steel - Food and Beverage Containers | X | 913 | 335 | 1,248 | 7 | 5 | 6 |
| Steel/Aluminum - Aerosol Containers (Non-MHSW) | X | 156 | 58 | 214 | 1 | 1 | 1 |
| Other Aluminum - Non-Blue Box | | 12.2 | 4.5 | 17 | 0.1 | 0.1 | 0.1 |
| Other Steel - Non-Blue Box | | 574 | 164 | 738 | 4 | 3 | 4 |
| **Total Metals** | | **2,423** | **844** | **3,266** | **18** | **13** | **16** |
| **Targeted BB Metals** | | **1,837** | **675** | **2,512** | **13** | **10** | **13** |
| **5. GLASS** | | | | | | | |
| Clear Glass | X | 1,677 | 500 | 2,177 | 12 | 8 | 11 |
| Coloured Glass | X | 454 | 95 | 549 | 3 | 1 | 3 |
| Other Glass - Non-Blue Box | | 538 | 306 | 844 | 4 | 5 | 4 |
| **Total Glass** | | **2,669** | **901** | **3,569** | **20** | **14** | **18** |
| **Targeted BB Glass** | | **2,131** | **595** | **2,725** | **16** | **9** | **14** |
| **6. MUNICIPAL HAZARDOUS AND SPECIAL WASTE** | | | | | | | |
| Paint & Stain Containers | X | 64 | 2 | 65 | 0 | 0.0 | 0.3 |
| Lubricating Oil Containers | | 13 | 2 | 15 | 0.1 | 0.0 | 0.1 |
| Batteries | | 126 | 18 | 144 | 1 | 0.3 | 1 |
| Other MHSW | | 152 | 22 | 174 | 1 | 0 | 1 |
| **Total MHSW** | | **355** | **43** | **398** | **3** | **1** | **2** |
| **Targeted BB MHSW** | | **64** | **2** | **65** | **0** | **0.0** | **0.3** |
| **7. OTHER MATERIALS** | | | | | | | |
| Food Waste | | 25,658 | 8,802 | 34,459 | 188 | 136 | 173 |
| Yard Waste | | 1,387 | 397 | 1,783 | 10 | 6 | 9 |
| Diapers & Sanitary Products | | 4,060 | 929 | 4,989 | 30 | 14 | 25 |
| Textiles | | 2,142 | 1,041 | 3,183 | 16 | 16 | 16 |
| C&D | | 2,208 | 1,073 | 3,281 | 16 | 17 | 16 |
| Carpeting | | 1,115 | 542 | 1,656 | 8 | 8 | 8 |
| Electronics | | 753 | 366 | 1,119 | 6 | 6 | 6 |
| Other HSW | | 46 | 23 | 69 | 0.3 | 0.3 | 0.3 |
| Other Non-Recyclable Materials | | 11,038 | 5,358 | 16,396 | 81 | 83 | 82 |
| **Total Other Materials** | | **36,570** | **12,783** | **49,352** | **268** | **198** | **247** |
| **Total Targeted BB** | | **31,986** | **9,655** | **41,640** | **234** | **150** | **209** |
| **Grand Total** | | **82,276** | **27,153** | **109,429** | **603** | **421** | **548** |

**Table B8: Assumed Change 2016 to Per Household Generation**

| Material | Assumed Change 2016 to Per Household Generation[a] | Assumed Change 2025 to Per Household Generation[b] |
|---|---|---|
| Newspaper | -12% | -40% |
| Telephone Books | -23% | -75% |
| Old Magazines | -8% | -25% |
| Other Printed Paper | 3% | 10% |
| OCC | 11% | 35% |
| Gable Top | 12% | 40% |
| Paper Laminates | 8% | 25% |
| Aseptic | 12% | 40% |
| OBB | 0% | 0% |
| PET | 9% | 30% |
| HDPE | -3% | -10% |
| PS | -15% | -50% |
| Film | -3% | -10% |
| Plastic Laminates | 9% | 30% |
| Other Plastics | 18% | 60% |
| Aluminum Food & Beverage Cans | -3% | -10% |
| Foil and Other Aluminum | -3% | -10% |
| Steel Cans | -6% | -20% |
| Aerosol | 0% | 0% |
| Paint Cans | -9% | -30% |
| Food & Beverage Glass Clear | -9% | -30% |
| Food & Beverage Glass Coloured | -9% | -30% |

**Notes**

(a) Assumed to be 30% of the estimated change for the year 2025.

(b) From *Executive Summary a Study of the Optimization of the Blue Box Material Processing System in Ontario Final Report (Waste Diversion Organization, 2012)*

**Table B9: Estimated 2016 Garbage and Blue Box Composition – Base Case**

| Material Category | Materials Accepted in London's Program | Estimated 2016 Garbage and Blue Box Composition | | | |
|---|---|---|---|---|---|
| | | Blue Box tonne/yr | Garbage tonne/yr | Total tonne/yr | Capture Rate |
| **1. PAPER** | | | | | |
| Newsprint | X | 8,502 | 1,215 | 9,717 | 88% |
| Magazines and Catalogues | X | 2,986 | 427 | 3,412 | 88% |
| Directories / Telephone Books | X | 188 | 27 | 214 | 88% |
| Mixed Fine Paper | X | 1,373 | 1,678 | 3,051 | 45% |
| Books | X | 570 | 178 | 748 | 76% |
| Other Printed Materials - Non-Recyclable | | 0.0 | 588 | 588 | 0% |
| **Total Paper** | | **13,618** | **4,111** | **17,729** | **77%** |
| **Targeted BB Paper** | | **13,618** | **3,523** | **17,141** | **79%** |
| **2. PAPER PACKAGING** | | | | | |
| Gable Top Containers | X | 304 | 164 | 467 | 65% |
| Aseptic Containers | X | 101 | 87 | 188 | 54% |
| Spiral Wound Containers | X | 69 | 89 | 159 | 44% |
| Corrugated Cardboard | X | 4,282 | 1,070 | 5,352 | 80% |
| Boxboard / Cores (Tubes) | X | 3,219 | 1,733 | 4,952 | 65% |
| Polycoat Cups/Ice Cream Containers | X | 202 | 259 | 461 | 44% |
| Other Bleached Long Polycoat Fibre | X | 0.0 | 74 | 74 | 0% |
| Other Paper Laminate Categories - Non-Recyclable | | 0.0 | 451 | 451 | 0% |
| Tissue/Toweling - Non-Recyclable | | 0.0 | 4,226 | 4,226 | 0% |
| **Total Paper Packaging** | | **8,176** | **8,154** | **16,330** | **50%** |
| **Targeted BB Paper Packaging** | | **7,975** | **3,143** | **11,118** | **72%** |
| **3. PLASTICS** | | | | | |
| #1 PET | X | 1,527 | 654 | 2,181 | 70% |
| #2 HDPE | X | 568 | 243 | 811 | 70% |
| #3 - #7 Mixed Plastics | X | 374 | 562 | 936 | 40% |
| #6 PS - Expanded Polystyrene | X | 0.0 | 361 | 361 | 0% |
| Large HDPE & PP Pails & Lids | X | 20 | 37 | 57 | 35% |
| LDPE/HDPE Film | | 141 | 3,180 | 3,321 | 4% |
| Plastic Laminates - Mostly Non-Recyclable | | 0.0 | 1,283 | 1,283 | 0% |
| Other Rigid Plastic Packaging - Mostly Non-Recyclable | | 0.0 | 980 | 980 | 0% |
| Other Plastics - Non-Packaging/Durable - Non-Recyclable | | 0.0 | 1,432 | 1,432 | 0% |
| **Total Plastics** | | **2,630** | **8,733** | **11,363** | **23%** |
| **Targeted BB Plastics** | | **2,489** | **1,496** | **3,985** | **62%** |

**Table B9: Estimated 2016 Garbage and Blue Box Composition – Base Case (continued)**

| Material Category | Materials Accepted in London's Program | Estimated 2016 Garbage and Blue Box Composition | | | |
|---|---|---|---|---|---|
| | | Blue Box tonne/yr | Garbage tonne/yr | Total tonne/yr | Capture Rate |
| **4. METALS** | | | | | |
| Aluminum- Food/Beverage Containers | X | 507 | 217 | 724 | 70% |
| Aluminum - Foil and Trays | X | 27 | 229 | 256 | 11% |
| Steel - Food and Beverage Containers | X | 917 | 393 | 1,311 | 70% |
| Steel/Aluminum - Aerosol Containers (Non-MHSW) | X | 63 | 117 | 180 | 35% |
| Other Aluminum - Non-Blue Box | | 0.0 | 14 | 14 | 0% |
| Other Steel - Non-Blue Box | | 218 | 404 | 622 | 35% |
| **Total Metals** | | **1,732** | **1,375** | **3,107** | **56%** |
| **Targeted BB Metals** | | **1,514** | **957** | **2,470** | **61%** |
| **5. GLASS** | | | | | |
| Clear Glass | X | 1,835 | 786 | 2,621 | 70% |
| Coloured Glass | X | 523 | 141 | 664 | 79% |
| Other Glass - Non-Blue Box | | 0.0 | 703 | 703 | 0% |
| **Total Glass** | | **2,358** | **1,631** | **3,988** | **59%** |
| **Targeted BB Glass** | | **2,358** | **927** | **3,285** | **72%** |
| **6. MUNICIPAL HAZARDOUS AND SPECIAL WASTE** | | | | | |
| Paint & Stain Containers | X | 15 | 41 | 56 | 28% |
| Lubricating Oil Containers | X | 6 | 7 | 13 | 48% |
| Batteries | | 0.0 | 122 | 122 | 0% |
| Other MHSW | | 0.0 | 148 | 148 | 0% |
| **Total MHSW** | | **22** | **317** | **339** | **6%** |
| **Targeted BB MHSW** | | **15** | **41** | **56** | **28%** |
| **7. OTHER MATERIALS** | | | | | |
| Food Waste | | 0.0 | 28,983 | 28,983 | 0% |
| Yard Waste | | 0.0 | 1,504 | 1,504 | 0% |
| Diapers & Sanitary Products | | 0.0 | 4,222 | 4,222 | 0% |
| Textiles | | 0.0 | 2,660 | 2,660 | 0% |
| C&D | | 0.0 | 2,742 | 2,742 | 0% |
| Carpeting | | 0.0 | 1,384 | 1,384 | 0% |
| Electronics | | 0.0 | 935 | 935 | 0% |
| Other HSW | | 0.0 | 58 | 58 | 0% |
| Other Non-Recyclable Materials | | 0.0 | 13,704 | 13,704 | 0% |
| **Total Other Materials** | | **0.0** | **41,497** | **41,497** | **0%** |
| **Total Targeted BB** | | **27,969** | **10,088** | **38,056** | **73%** |
| **Grand Total** | | **28,535** | **65,818** | **94,353** | **30%** |

**Table B10: Estimated 2025 Garbage and Blue Box Composition – Base Case**

| Material Category | Materials Accepted in London's Program | Estimated 2025 - Natural Cap. Garbage and Blue Box Composition | | | |
|---|---|---|---|---|---|
| | | Blue Box tonne/yr | Garbage tonne/yr | Total tonne/yr | Capture Rate |
| **1. PAPER** | | | | | |
| Newsprint | X | 6,227 | 692 | 6,919 | 90% |
| Magazines and Catalogues | X | 2,733 | 304 | 3,037 | 90% |
| Directories / Telephone Books | X | 57 | 6 | 64 | 90% |
| Mixed Fine Paper | X | 1,992 | 1,992 | 3,983 | 50% |
| Books | X | 710 | 177 | 887 | 80% |
| Other Printed Materials - Non-Recyclable | | 0.0 | 698 | 698 | 0% |
| **Total Paper** | | **11,719** | **3,869** | **15,588** | **75%** |
| **Targeted BB Paper** | | **11,719** | **3,171** | **14,890** | **79%** |
| **2. PAPER PACKAGING** | | | | | |
| Gable Top Containers | X | 547 | 235 | 782 | 70% |
| Aseptic Containers | X | 187 | 125 | 312 | 60% |
| Spiral Wound Containers | X | 118 | 118 | 236 | 50% |
| Corrugated Cardboard | X | 7,256 | 1,281 | 8,537 | 85% |
| Boxboard / Cores (Tubes) | X | 3,826 | 2,060 | 5,886 | 65% |
| Polycoat Cups/Ice Cream Containers | X | 342 | 342 | 685 | 50% |
| Other Bleached Long Polycoat Fibre | X | 0.0 | 111 | 111 | 0% |
| Other Paper Laminate Categories - Non-Recyclable | | 0.0 | 670 | 670 | 0% |
| Tissue/Toweling - Non-Recyclable | | 0.0 | 5,025 | 5,025 | 0% |
| **Total Paper Packaging** | | **12,277** | **9,966** | **22,243** | **55%** |
| **Targeted BB Paper Packaging** | | **11,935** | **3,818** | **15,753** | **76%** |
| **3. PLASTICS** | | | | | |
| #1 PET | X | 2,359 | 1,011 | 3,370 | 70% |
| #2 HDPE | X | 607 | 260 | 868 | 70% |
| #3 - #7 Mixed Plastics | X | 625 | 764 | 1,389 | 45% |
| #6 PS - Expanded Polystyrene | X | 0 | 215 | 215 | 0% |
| Large HDPE & PP Pails & Lids | X | 27 | 41 | 68 | 40% |
| LDPE/HDPE Film | | 178 | 3,376 | 3,554 | 5% |
| Plastic Laminates - Mostly Non-Recyclable | | 0.0 | 1,984 | 1,984 | 0% |
| Other Rigid Plastic Packaging - Mostly Non-Recyclable | | 0.0 | 1,863 | 1,863 | 0% |
| Other Plastics - Non-Packaging/Durable - Non-Recyclable | | 0.0 | 1,702 | 1,702 | 0% |
| **Total Plastics** | | **3,796** | **11,216** | **15,012** | **25%** |
| **Targeted BB Plastics** | | **3,619** | **2,076** | **5,695** | **64%** |

**Table B10: Estimated 2025 Garbage and Blue Box Composition – Base Case (continued)**

| Material Category | Materials Accepted in London's Program | Estimated 2025 - Natural Cap. Garbage and Blue Box Composition | | | |
|---|---|---|---|---|---|
| | | Blue Box tonne/yr | Garbage tonne/yr | Total tonne/yr | Capture Rate |
| **4. METALS** | | | | | |
| Aluminum- Food/Beverage Containers | X | 543 | 233 | 775 | 70% |
| Aluminum - Foil and Trays | X | 41 | 233 | 274 | 15% |
| Steel - Food and Beverage Containers | X | 874 | 374 | 1,248 | 70% |
| Steel/Aluminum - Aerosol Containers (Non-MHSW) | X | 86 | 129 | 214 | 40% |
| Other Aluminum - Non-Blue Box | | 0.0 | 17 | 17 | 0% |
| Other Steel - Non-Blue Box | | 295 | 443 | 738 | 40% |
| **Total Metals** | | **1,838** | **1,428** | **3,266** | **56%** |
| **Targeted BB Metals** | | **1,543** | **969** | **2,512** | **61%** |
| **5. GLASS** | | | | | |
| Clear Glass | X | 1,741 | 435 | 2,177 | 80% |
| Coloured Glass | X | 439 | 110 | 549 | 80% |
| Other Glass - Non-Blue Box | | 0.0 | 844 | 844 | 0% |
| **Total Glass** | | **2,180** | **1,389** | **3,569** | **61%** |
| **Targeted BB Glass** | | **2,180** | **545** | **2,725** | **80%** |
| **6. MUNICIPAL HAZARDOUS AND SPECIAL WASTE** | | | | | |
| Paint & Stain Containers | X | 20 | 46 | 65 | 30% |
| Lubricating Oil Containers | X | 8 | 8 | 15 | 50% |
| Batteries | | 0.0 | 144 | 144 | 0% |
| Other MHSW | | 0.0 | 174 | 174 | 0% |
| **Total MHSW** | | **27** | **371** | **398** | **7%** |
| **Targeted BB MHSW** | | **20** | **46** | **65** | **30%** |
| **7. OTHER MATERIALS** | | | | | |
| Food Waste | | 0.0 | 34,459 | 34,459 | 0% |
| Yard Waste | | 0.0 | 1,783 | 1,783 | 0% |
| Diapers & Sanitary Products | | 0.0 | 4,989 | 4,989 | 0% |
| Textiles | | 0.0 | 3,183 | 3,183 | 0% |
| C&D | | 0.0 | 3,281 | 3,281 | 0% |
| Carpeting | | 0.0 | 1,656 | 1,656 | 0% |
| Electronics | | 0.0 | 1,119 | 1,119 | 0% |
| Other HSW | | 0.0 | 69 | 69 | 0% |
| Other Non-Recyclable Materials | | 0.0 | 16,396 | 16,396 | 0% |
| **Total Other Materials** | | **0.0** | **49,352** | **49,352** | **0%** |
| **Total Targeted BB** | | **31,016** | **10,625** | **41,640** | **74%** |
| **Grand Total** | | **31,838** | **77,591** | **109,429** | |

**Table B11: Estimated 2025 Garbage and Blue Box Composition – High Increase in Capture Rate**

| Material Category | Materials Accepted in London's Program | Estimated 2025 - High Cap. Garbage and Blue Box Composition | | | |
|---|---|---|---|---|---|
| | | Blue Box tonne/yr | Garbage tonne/yr | Total tonne/yr | Capture Rate |
| **1. PAPER** | | | | | |
| Newsprint | X | 6,227 | 692 | 6,919 | 90% |
| Magazines and Catalogues | X | 2,733 | 304 | 3,037 | 90% |
| Directories / Telephone Books | X | 57 | 6 | 64 | 90% |
| Mixed Fine Paper | X | 2,390 | 1,593 | 3,983 | 60% |
| Books | X | 799 | 89 | 887 | 90% |
| Other Printed Materials - Non-Recyclable | | 0.0 | 698 | 698 | 0% |
| **Total Paper** | | **12,206** | **3,382** | **15,588** | **78%** |
| **Targeted BB Paper** | | **12,206** | **2,684** | **14,890** | **82%** |
| **2. PAPER PACKAGING** | | | | | |
| Gable Top Containers | X | 586 | 195 | 782 | 75% |
| Aseptic Containers | X | 234 | 78 | 312 | 75% |
| Spiral Wound Containers | X | 165 | 71 | 236 | 70% |
| Corrugated Cardboard | X | 7,683 | 854 | 8,537 | 90% |
| Boxboard / Cores (Tubes) | X | 4,120 | 1,766 | 5,886 | 70% |
| Polycoat Cups/Ice Cream Containers | X | 411 | 274 | 685 | 60% |
| Other Bleached Long Polycoat Fibre | X | 55 | 55 | 111 | 50% |
| Other Paper Laminate Categories - Non-Recyclable | | 0.0 | 670 | 670 | 0% |
| Tissue/Toweling - Non-Recyclable | | 0.0 | 5,025 | 5,025 | 0% |
| **Total Paper Packaging** | | **13,255** | **8,988** | **22,243** | **60%** |
| **Targeted BB Paper Packaging** | | **12,789** | **2,964** | **15,753** | **81%** |
| **3. PLASTICS** | | | | | |
| #1 PET | X | 2,528 | 843 | 3,370 | 75% |
| #2 HDPE | X | 651 | 217 | 868 | 75% |
| #3 - #7 Mixed Plastics | X | 694 | 694 | 1,389 | 50% |
| #6 PS - Expanded Polystyrene | X | 0.0 | 215 | 215 | 0% |
| Large HDPE & PP Pails & Lids | X | 34 | 34 | 68 | 50% |
| LDPE/HDPE Film | | 178 | 3,376 | 3,554 | 5% |
| Plastic Laminates - Mostly Non-Recyclable | | 0.0 | 1,984 | 1,984 | 0% |
| Other Rigid Plastic Packaging - Mostly Non-Recyclable | | 0.0 | 1,863 | 1,863 | 0% |
| Other Plastics - Non-Packaging/Durable - Non-Recyclable | | 0.0 | 1,702 | 1,702 | 0% |
| **Total Plastics** | | **4,084** | **10,928** | **15,012** | **27%** |
| **Targeted BB Plastics** | | **3,907** | **1,788** | **5,695** | **69%** |

**Table B11: Estimated 2025 Garbage and Blue Box Composition – High Increase in Capture Rate (continued)**

| Material Category | Materials Accepted in London's Program | Estimated 2025 - High Cap. Garbage and Blue Box Composition | | | |
|---|---|---|---|---|---|
| | | Blue Box tonne/yr | Garbage tonne/yr | Total tonne/yr | Capture Rate |
| **4. METALS** | | | | | |
| Aluminum- Food/Beverage Containers | X | 582 | 194 | 775 | 75% |
| Aluminum - Foil and Trays | X | 82 | 192 | 274 | 30% |
| Steel - Food and Beverage Containers | X | 936 | 312 | 1,248 | 75% |
| Steel/Aluminum - Aerosol Containers (Non-MHSW) | X | 107 | 107 | 214 | 50% |
| Other Aluminum - Non-Blue Box | | 0.0 | 17 | 17 | 0% |
| Other Steel - Non-Blue Box | | 369 | 369 | 738 | 50% |
| **Total Metals** | | **2,076** | **1,191** | **3,266** | **64%** |
| **Targeted BB Metals** | | **1,707** | **805** | **2,512** | **68%** |
| **5. GLASS** | | | | | |
| Clear Glass | X | 1,850 | 326 | 2,177 | 85% |
| Coloured Glass | X | 466 | 82 | 549 | 85% |
| Other Glass - Non-Blue Box | | 0.0 | 844 | 844 | 0% |
| **Total Glass** | | **2,316** | **1,253** | **3,569** | **65%** |
| **Targeted BB Glass** | | **2,316** | **409** | **2,725** | **85%** |
| **6. MUNICIPAL HAZARDOUS AND SPECIAL WASTE** | | | | | |
| Paint & Stain Containers | X | 33 | 33 | 65 | 50% |
| Lubricating Oil Containers | X | 8 | 8 | 15 | 50% |
| Batteries | | 0.0 | 144 | 144 | 0% |
| Other MHSW | | 0.0 | 174 | 174 | 0% |
| **Total MHSW** | | **40** | **358** | **398** | **10%** |
| **Targeted BB MHSW** | | **33** | **33** | **65** | **50%** |
| **7. OTHER MATERIALS** | | | | | |
| Food Waste | | 0.0 | 34,459 | 34,459 | 0% |
| Yard Waste | | 0.0 | 1,783 | 1,783 | 0% |
| Diapers & Sanitary Products | | 0.0 | 4,989 | 4,989 | 0% |
| Textiles | | 0.0 | 3,183 | 3,183 | 0% |
| C&D | | 0.0 | 3,281 | 3,281 | 0% |
| Carpeting | | 0.0 | 1,656 | 1,656 | 0% |
| Electronics | | 0.0 | 1,119 | 1,119 | 0% |
| Other HSW | | 0.0 | 69 | 69 | 0% |
| Other Non-Recyclable Materials | | 0.0 | 16,396 | 16,396 | 0% |
| **Total Other Materials** | | **0.0** | **49,352** | **49,352** | **0%** |
| **Total Targeted BB** | | **32,958** | **8,682** | **41,640** | **79%** |
| **Grand Total** | | **33,978** | **75,451** | **109,429** | **31%** |

## Table B12: Capture Rates

| Materials | Estimated 2012 Capture Rates for London | | | Estimated Capture Rates for Ontario from *A study of the Optiza of Blue Box Material Processing System in Ontarion* (June, 2012) | | | Projected Short Term Change London's Capture Rate (2016) | | | Projected Long Term Change to Overall London's Capture Rate | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Curbside | Multi-Residential | Overall | 2010 | Natural Growth 2025 | High Growth 2025 | Curbside | Multi-Residential | Overall | Natural Growth 2025 | HIgh Growth 2025 |
| **1. PAPER** | | | | | | | | | | | |
| Newsprint | 95% | 56% | 87% | 97% | 98% | 98% | 95% | 65% | 88% | 90% | 90% |
| Magazines and Catalogues | 94% | 55% | 85% | 97% | 98% | 98% | 95% | 65% | 88% | 90% | 90% |
| Directories / Telephone books | 82% | 48% | 75% | 97% | 98% | 98% | 95% | 65% | 88% | 90% | 90% |
| Mixed Fine Paper | 50% | 29% | 45% | 56% | 60% | 75% | 50% | 30% | 45% | 50% | 60% |
| Books | 75% | 44% | 68% | - | - | - | 85% | 50% | 76% | 80% | 90% |
| Other Printed Materials -Non recycable | 29% | 17% | 26% | - | - | - | | | | | |
| **Total Paper** | 84% | 49% | 76% | | | | | | | | |
| **Targeted BB Paper** | 86% | 50% | 78% | | | | | | | | |
| **2. PAPER PACKAGING** | | | | | | | | | | | |
| Gable Top Containers | 75% | 29% | 61% | 34% | 50% | 75% | 76% | 32% | 65% | 70% | 75% |
| Aseptic Containers | 55% | 21% | 48% | 12% | 30% | 75% | 60% | 35% | 54% | 60% | 75% |
| Spiral wound containers | 44% | 17% | 37% | 1% | 5% | 30% | 50% | 25% | 44% | 50% | 70% |
| Corrugated Cardboard | 86% | 33% | 77% | 87% | 88% | 95% | 90% | 50% | 80% | 85% | 90% |
| Boxboard / cores (tubes) | 70% | 27% | 60% | 55% | 60% | 80% | 75% | 35% | 65% | 65% | 70% |
| Polycoat cups/Ice Cream Containers | 15% | 6% | 13% | 1% | 5% | 30% | 50% | 25% | 44% | 50% | 60% |
| Other bleached long polycoat fibre | 6% | 2% | 5% | 1% | 5% | 30% | 0% | 0% | 0% | 0% | 50% |
| Other paper laminate categories - Non recyclable | 7% | 3% | 6% | - | - | - | | | | | |
| Tissue/Toweling - Non recyclable | 0% | 0% | 0% | - | - | - | | | | | |
| **Total Paper Packaging** | 54% | 19% | 47% | | | | | | | | |
| **Targeted BB Paper Packaging** | 78% | 29% | 68% | | | | | | | | |
| **3. PLASTICS** | | | | | | | | | | | |
| #1 PET | 76% | 34% | 66% | 61% | 65% | 75% | 80% | 40% | 70% | 70% | 75% |
| #2 HDPE | 74% | 33% | 65% | 57% | 60% | 75% | 80% | 40% | 70% | 70% | 75% |
| #3 - #7 Mixed Plastics | 43% | 19% | 37% | 19% | 40% | 60% | 45% | 25% | 40% | 45% | 50% |
| #6 PS - Expanded polystyrene | 7% | 3% | 6% | 4% | 10% | 50% | 0% | 0% | 0% | 0% | 0% |
| Large HDPE & PP Pails & Lids | 25% | 11% | 22% | - | - | - | 40% | 20% | 35% | 40% | 50% |
| LDPE/HDPE Film | 6% | 2% | 5% | 6% | 15% | 40% | 5% | 2% | 4% | 5% | 5% |
| Plastic Laminates - mostly non recyclables | 3% | 1% | 3% | 1% | 1% | 10% | 0% | 0% | 0% | | |
| Other Rigid Plastic Packaging - mostly non recyclable | 23% | 10% | 20% | - | - | - | | | 0% | | |
| Other Plastics - non-packaging/durable - Non recyclable | 14% | 6% | 12% | - | - | - | | | | | |
| **Total Plastics** | 30% | 13% | 26% | | | | | | | | |
| **Targeted BB Plastics** | 67% | 30% | 58% | | | | | | | | |

## Table B12: Capture Rates (continued)

| Materials | Estimated 2012 Capture Rates for London | | | Estimated Capture Rates for Ontario from *A study of the Optiza of Blue Box Material Processing System in Ontarion* (June, 2012) | | | Projected Short Term Change London's Capture Rate (2016) | | | Projected Long Term Change to Overall London's Capture Rate | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Curbside | Multi-Residential | Overall | 2010 | Natural Growth 2025 | High Growth 2025 | Curbside | Multi-Residential | Overall | Natural Growth 2025 | HIgh Growth 2025 |
| **4. METALS** | | | | | | | | | | | |
| Aluminum- food/Beverage Containers | 79% | 31% | 67% | 50% | 55% | 75% | 80% | 40% | 70% | 70% | 75% |
| Aluminum - foil and trays | 14% | 5% | 12% | 9% | 20% | 50% | 12% | 6% | 11% | 15% | 30% |
| Steel - food and beverage containers | 77% | 30% | 66% | 61% | 65% | 75% | 80% | 40% | 70% | 70% | 75% |
| Steel/aluminum - aerosol containers (non-MHSW) | 19% | 7% | 16% | 28% | 30% | 50% | 40% | 20% | 35% | 40% | 50% |
| Other Aluminum - non-Blue Box | 0% | 0% | 0% | - | - | - | | | | | |
| Other steel - Non-Blue Box | 7% | 3% | 6% | - | - | - | 40% | 20% | 35% | 40% | 50% |
| **Total Metals** | 54% | 22% | 47% | | | | | | | | |
| **Targeted BB Metals** | 67% | 26% | 57% | | | | | | | | |
| **5. GLASS** | | | | | | | | | | | |
| Clear Glass | 77% | 34% | 68% | 89% | 90% | 95% | 80% | 40% | 70% | 80% | 85% |
| Coloured Glass | 93% | 40% | 84% | 71% | 72% | 80% | 90% | 45% | 79% | 80% | 85% |
| Other Glass - non-Blue Box | 28% | 12% | 22% | - | - | - | | | | | |
| **Total Glass** | 73% | 29% | 63% | | | | | | | | |
| **Targeted BB Glass** | 81% | 35% | 71% | | | | | | | | |
| **6. MUNICIPAL HAZARDOUS AND SPECIAL WASTE** | | | | | | | | | | | |
| Paint & Stain containers | 19% | 17% | 19% | - | - | - | 30% | 20% | 28% | 30% | 50% |
| Lubricating Oil Containers | 40% | 37% | 40% | - | - | - | 50% | 40% | 48% | 50% | 50% |
| Batteries | 2% | 1% | 2% | - | - | - | | | | | |
| Other MHSW | 23% | 21% | 23% | - | - | - | | | | | |
| **Total MHSW** | 15% | 13% | 15% | | | | | | | | |
| **Targeted BB MHSW** | 19% | 17% | 19% | | | | | | | | |
| **7. OTHER MATERIALS** | | | | | | | | | | | |
| Food Waste | 0% | 0% | 0% | - | - | - | | | | | |
| Yard Waste | 0% | 0% | 0% | - | - | - | | | | | |
| Diapers & Sanitary Products | 0% | 0% | 0% | - | - | - | | | | | |
| Textiles | 0% | 0% | 0% | - | - | - | | | | | |
| C&D | 0% | 0% | 0% | - | - | - | | | | | |
| Carpeting | 0% | 0% | 0% | - | - | - | | | | | |
| Electronics | 0% | 0% | 0% | - | - | - | | | | | |
| Other HSW | 0% | 0% | 0% | - | - | - | | | | | |
| Other non-recyclable materials | 3% | 3% | 3% | - | - | - | | | | | |
| **Total Other Materials** | 1% | 1% | 1% | | | | | | | | |
| **Total Targeted BB** | 80% | 39% | 71% | | | | | | | | |
| **Grand Total** | 30% | 13% | 26% | | | | | | | | |

# Appendix C
# Potential Materials to be Added to the Blue Box Program

**Introduction**

The City of London accepts 14 categories of recyclable materials in its Blue Box program: 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, tubs & trays; milk & juice cartons; drink boxes and cardboard cans.

The existing Blue Box program includes all "low hanging fruit", materials that can be managed at a reasonable cost or constitute a large portion of the waste stream. A review of other municipalities in Ontario found six "more difficult" to recycle materials that are being recycled by at least one municipality. These materials are:

1. Mixed Polycoat (e.g., coffee cups, cold beverage cups, ice cream containers)
2. Batteries (limited to single use batteries)
3. Metal Cookware (e.g., pots, pans)
4. Blister Packaging (e.g., rigid plastic around toys, hardware)
5. Film plastic (e.g., plastic bags)
6. Expanded Polystyrene (e.g., meat trays, foam cups, packaging materials)

The financial, environmental and social considerations as well as technical issues of adding these materials to the City's Blue Box recycling program are presented in Tables C-1 and C-2.

In summary, the following materials require further investigation before a final recommendation can be made with respect to adding them to the Blue Box Program: mixed polycoat (e.g., coffee cups, cold beverage cups, ice cream containers); batteries (limited to single use batteries); metal cookware (e.g., pots, pans); and blister packaging (e.g., rigid plastic around toys, hardware).

The following materials are not recommended to be added to the Blue Box Program: film plastic (e.g., plastic bags) and expanded polystyrene (e.g., meat trays, foam cups, packaging materials).

***Table C-1: Overview of Key Environmental, Social & Financial Considerations and Technical Issues of Materials that Need Further Investigation***

| Consideration | | Material Recommended for Further Investigation | |
|---|---|---|---|
| | | **Mixed Polycoat (e.g., coffee cups, ice cream containers)** | **Blister Packaging (e.g., rigid packaging around toys)** |
| **Environmental** | *Estimated Annual Tonnes Diverted* | *190* | *40* |
| | *Estimated Annual Units Diverted (a)* | *15,000,000* | *1,000,000* |
| | *Annual GHG Savings Equivalent to (b)* | *400 tonnes*<br>*100 cars removed from the road* | *80 tonnes*<br>*24 cars removed from the road* |
| | *Annual Energy Savings Equivalent to (c)* | *3,300 GJ*<br>*100 homes supplied with electricity* | *2,400 GJ*<br>*70 homes supplied with electricity* |
| **Social** | *Public Support* | • *Strong*<br>• *10% to 20% of material already being placed in Blue Box* | • *Average*<br>• *5% of material already being placed in Blue Box* |
| | *Resident Issues* | • *May be confusion where to place (paper products or containers)*<br>• *Light weight materials may increase street litter on windy days* | • *Removes some confusion of which plastics are recyclable*<br>• *Light weight materials may increase street litter on windy days* |
| **Financial** | *Additional Collection Cost (d)* | *$0* | *$5,000* |
| | *Estimated Processing Cost (d)* | *$30,000 to $40,000* | *$3,000* |
| | *Market/Revenue* | • *Limited markets but growing*<br>• *$60 to $120/tonne ($7,000 to $15,000/yr)* | • *Limited markets but growing*<br>• *$30 to $50/tonne ($1,000 to $2,000/yr)*<br>• *Some municipalities staring to collect* |
| **Technical** | *Collection Issues* | • *None* | • *None* |
| | *Processing Issues* | • *Regional MRF capable of processing*<br>• *Possible contamination issues from lids being left on or food placed inside container* | • *Regional MRF capable of processing*<br>• *Possible contamination issues if resident does not remove paper inside plastic packaging* |

***Notes***

*(a) Based on average size of units.*

(b) *Estimated Greenhouse Gas (GHG)* savings are the emissions avoided equivalent to the specified number of cars being removed from the road per year (i.e., the recycling of these materials has avoided the GHG emissions equivalent to the identified number of vehicles per year). GHG savings were estimated using the *EPA Warm Model*.

(c) Estimated energy savings equivalent to the amount of electricity not being used by the specified number of homes per year (i.e., the recycling of these materials has avoided the equivalent electricity consumption requirements of the identified number of homes per year). Energy savings were estimated using the *EPA Warm Model*.

(d) Estimates provided by current contractor (Miller Waste Systems).

Table C-1 continued on next page

**Table C-1: Overview of Key Environmental, Social & Financial Considerations and Technical Issues of Materials that Need Further Investigation**

| Consideration | | Material Recommended for Further Investigation | |
|---|---|---|---|
| | | **Batteries (e.g., single use batteries)** | **Metal Cookware (e.g., pots, pans)** |
| **Environmental** | Estimated Annual Tonnes Diverted | 35 | 80 |
| | Estimated Annual Units Diverted (a) | 1,500,000 | 50,000 |
| | Annual GHG Savings Equivalent to (b) | Not available | 140 tonnes<br>30 cars removed from the road |
| | Annual Energy Savings Equivalent to (c) | Not available | 1,700 GJ<br>50 homes supplied with electricity |
| **Social** | Public Support | • Strong | • Average |
| | Resident Issues | • Communication plan required to reach residents about how to use program (program only for single use batteries and collection only twice per year) | • Residents may place other metal items (non-cookware) in Blue Box in error |
| **Financial** | Additional Collection Cost (d) | $15,000 | $10,000 |
| | Estimated Processing Cost (d) | $0 | $30,000 to $40,000 |
| | Market/Revenue | • Ontario<br>• Stable<br>• $300 to $700/tonne ($10,000 to $25,000/yr) | • Ontario<br>• Stable<br>• $200 to $350/tonne ($8,000 to $15,000/yr) |
| **Technical** | Collection Issues | • Residents may set out batteries on non-collection weeks by mistake | • None |
| | Processing Issues | • No processing issues<br>• Regional MRF capable of processing | • No processing issues<br>• Modifications required to MRF to handle larger metal pieces ($60,000) |

**Notes**

(a) Based on average size of units.

(b) Estimated Greenhouse Gas (GHG) savings are the emissions avoided equivalent to the specified number of cars being removed from the road per year (i.e., the recycling of these materials has avoided the GHG emissions equivalent to the identified number of vehicles per year). GHG savings were estimated using the *EPA Warm Model*.

(c) Estimated energy savings equivalent to the amount of electricity not being used by the specified number of homes per year (i.e., the recycling of these materials has avoided the equivalent electricity consumption requirements of the identified number of homes per year). Energy savings were estimated using the *EPA Warm Model*.

(d) Estimates provided by current contractor (Miller Waste Systems).

**Table C-2: Overview of Key Environmental, Social, Financial Considerations &Technical Issues of Materials not Recommended to be Added to the Blue Box Recycling Program**

| Consideration | | Material not Recommended to be Added | |
|---|---|---|---|
| | | **Film Plastic (e.g., grocery bags)** | **Expanded Foam Polystyrene (e.g., meat trays)** |
| **Environmental** | Estimated Annual Tonnes Diverted | 400 | 60 |
| | Estimated Annual Units Diverted (a) | 50,000,000 | 7,500,000 |
| | Annual GHG Savings Equivalent to (b) | 400 tonnes<br>100 cars removed from the road | 60 tonnes<br>15 cars removed from the road |
| | Annual Energy Savings Equivalent to (c) | 18,000 GJ<br>500 homes supplied with electricity | 2,600 GJ<br>80 homes supplied with electricity |
| **Social** | Public Support | • Strong | • Strong |
| | Resident Issues | • Light weight materials may increase street litter on windy days<br>• Residents can already recycle plastic bags at many retail outlets | • Light weight materials may increase street litter on windy days<br>• Some packaging is too large to collect |
| **Financial** | Additional Collection Cost (d) | $200,000 to $225,000 | $125,000 to $150,000 |
| | Estimated Processing Cost (d) | $400,000 to $450,000 | $150,000 to $200,000 |
| | Market/Revenue | • North American<br>• Stable<br>• Revenue significantly less than processing cost<br>• 0 to $30/tonne ($0 - $15,000/yr) | • Limited Markets<br>• Unstable<br>• Revenue significantly less than processing cost<br>• $300 to $700/tonne ($10,000 - $25,000/yr) |
| **Technical** | Collection Issues | • None | • None |
| | Processing Issues | • Regional MRF capable of processing<br>• May cause cross-contamination<br>• May increase equipment maintenance requirements | • Regional MRF capable of processing<br>• May cause cross-contamination and increase equipment maintenance<br>• Low capture (majority breaks up goes to residue); only 180 tonnes recycled from 3.0 million homes with program in 2012 |

**Notes**

(a) Based on average size of units.

(b) Estimated Greenhouse Gas (GHG) savings are the emissions avoided equivalent to the specified number of cars being removed from the road per year (i.e., the recycling of these materials has avoided the GHG emissions equivalent to the identified number of vehicles per year). GHG savings were estimated using the *EPA Warm Model.*

(c) Estimated energy savings equivalent to the amount of electricity not being used by the specified number of homes per year (i.e., the recycling of these materials has avoided the equivalent electricity consumption requirements of the identified number of homes per year). Energy savings were estimated using the *EPA Warm Model.*

(d) Estimates provided by current contractor (Miller Waste Systems).

# Appendix D
# Green Bin Information

## D.1 Green Bin Pilot Project

Background

Details of the Green Bin Pilot Project are provided in Table D-1 (next page) and summarized below.

Residents were given the option of participating in the Green Bin program and offered a choice of three different size bins to use to hold their household organics (e.g., food scraps). Residents were also provided a kitchen catcher and educational material.

The Pilot Project was also used to test a "seasonal" garbage collection schedule. The seasonal garbage collection schedule consisted of weekly, same day, garbage collection during the summer (April to September) and bi-weekly, same day, collection during the winter (October to March). Testing the seasonal collection schedule helped to determine public acceptance of the program, and the cost savings/increases resulting from this type of collection schedule.

Pilot Project - Resident Demographics

The data presented here is a summary of demographic information on the Green Bin Pilot Area. The source of this data is Environics Analytics which is available to staff under an existing contract with Environics Analytics. The data are compiled from Statistics Canada's census data and from other private and public surveys.

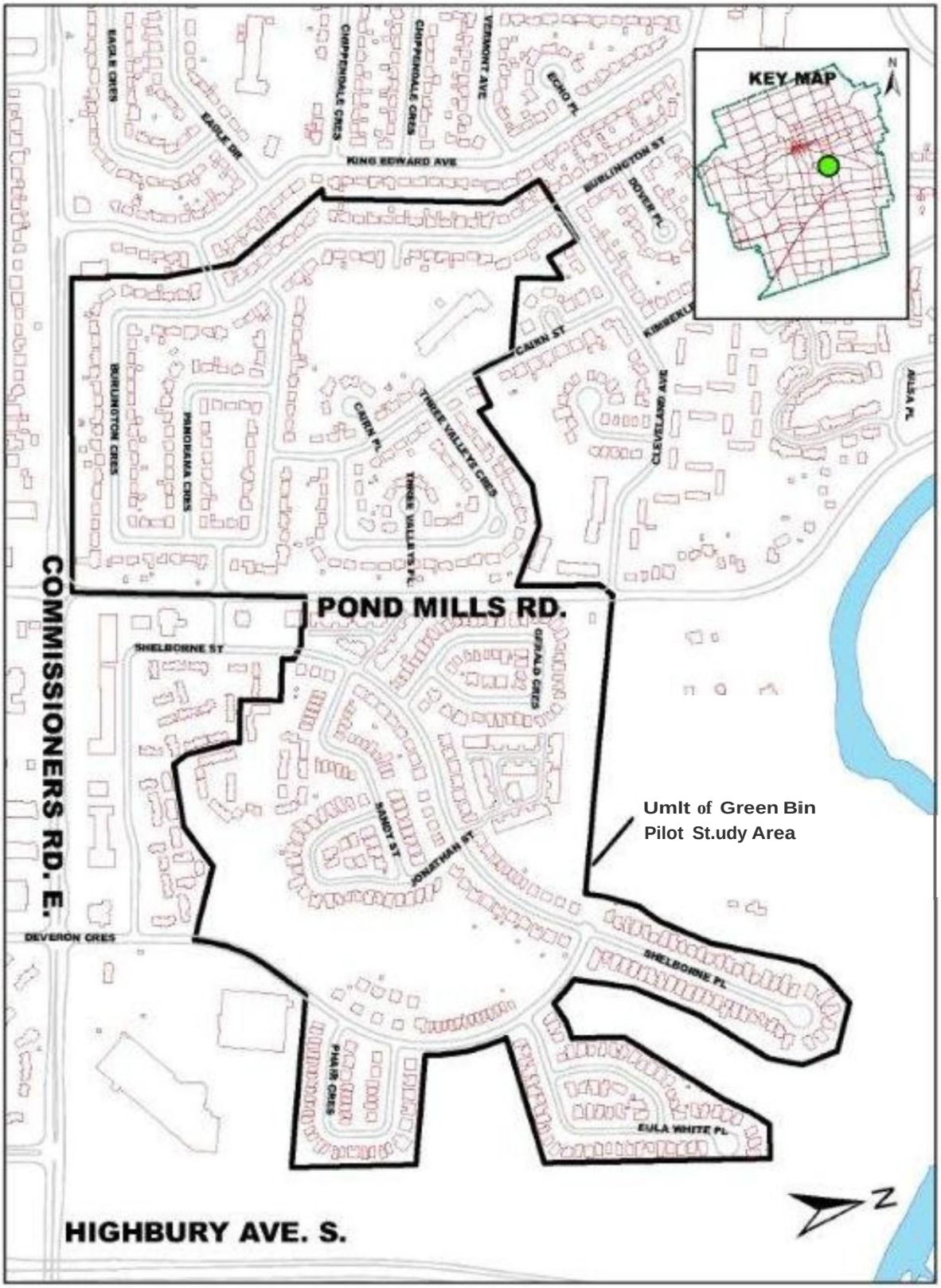
The Green Bin Pilot Area includes 763 households (population of approximately 2,010). The Area accounts for approximately 0.6 % of London curbside households and approximately 0.6% of London's curbside population.

In general, the area has many similar demographic characteristics as other parts of London. It should be noted however, that London is comprised of many neighbourhoods which have their own unique demographic characteristics, which when blended together produce a 'mathematical average.' In addition to representing many attributes of a typical London neighbourhood, the Green Bin neighbourhood was selected in part because it provided a range of housing types which would allow us to experience all collection issues that may occur (hills, large and small yards, homes with and without garages, row housing, etc.).

**Table D-1 : Overview of Green Bin Pilot/Modified Collection Schedule Project**

| *Component* | *Comment* |
|---|---|
| Collection Area | Location – Ponds Mills (see Figure D-1)<br>Number of Homes - 762 |
| Collection Frequency | Recycling – Weekly (52 pickups per year)<br>Green Bin – Weekly (52 pickups per year)<br>Garbage - Summer (April to September), Weekly (26 pickups per year)<br>- Winter (October to March), Weekly (13 pickups per year) |
| Cart Selection | Residents could choose from a 45 litre, 80 litre or 120 litre cart based on their needs and room to store the cart. Approximately half of the residents requested a specific cart size as follows:<br>• 45 litre – 150 (40%)<br>• 80 litre – 186 (50%)<br>• 120 litre – 41 (10%) |
| Kitchen Catcher Selection | Residents could choose from three types of kitchen catcher based on their needs. Approximately half the residents requested a specific kitchen catcher as follows:<br>• Orbis (standard) – 115 (30%)<br>• Sure-Close (air holes) – 217 (60%)<br>• Busch (small) – 45 (10%) |
| Liners | Paper liners or certified compostable liners are allowed.<br>Plastic bags are not allowed as liners. |
| Materials Collected | Materials collected include:<br>• Food waste<br>• Paper products that cannot go in the Blue Box (e.g. paper towels and napkins, other soiled paper)<br>• Animal bedding<br>• Can be topped up with yard materials |
| Materials Not Collected | Materials not collected include but are not limited to:<br>• Diapers and sanitary products<br>• Kitty litter and pet waste |
| Educational Material | All residents were provided with educational materials at the start of the pilot project including:<br>• Booklet detailing the project<br>• Fridge magnet showing the materials accepted in the Green Bin Pilot Project<br>• Waste Reduction & Conservation Calendar for the pilot area |

Figure D-1 : Green Bin Pilot Project Area



Demographically, when compared with average values for London, the demographics below are highlighted as they represent the largest variance from the average for London. Other demographic information is not included as it was the same as the average for London.

- There are fewer households with a single occupant (19% compared to 30%) and more households with 4 or more persons (27% compared to 21%).
- There are more households headed by younger people. The difference is greatest in two age groupings - those 35 to 44 years of age (21% compared to 17%) and in the 65 and older age group (14% compared to 22%).
- 44% have post-secondary qualifications, compared to 54% for London and 13% have a university degree compared to 23% for London.
- The average household income for the area is $69,500, which is 16% below the London average of $82,600.
- There is a higher percent of visible minorities (22% compared to 18%).

Pilot Project – Participation, Green Bin Quantities and Total Waste Diversion

*Participation*

- 92% of households in the Green Bin Pilot Project area agreed to participate.
- 100% of the households were required to participate in the bi-weekly garbage pickup portion of the project
- actual Green Bin participation rate averaged between 50 to 55% in single family homes (with some periods of the year showing slightly higher rates) and 10 to 20% in townhome complexes
- participation rates in London were typical of most other full scale Green Bin programs in Ontario. Higher participation rates are typically associated with programs with operational adjustments (e.g., garbage pickup every two weeks) and/or advanced education and awareness programs.

*Green Bin Quantities*

- on average 1.7 tonnes to 1.9 tonnes of Green Bin materials were collected each week
- the amount of Green Bin materials diverted from all single family households in the Green Bin area, on average, was about 2.4 to 2.7 kg per week (130 to 140 kg/yr) and about 0.7 to 1.0 kg per week (35 to 50 kg/yr) from townhomes. This suggests that a participating household would be diverting about 240 to 280 kg/yr

- the amount diverted per household is within the range collected in other programs in Ontario that limit yard waste and do not allow use of plastic bags. Municipalities that encourage the placement of grass clippings and yard waste into the curbside carts have higher diversion rates for Green Bin. In addition, the few communities that permit the use of plastic bags and a broader range of materials into the Green Bin appear to have higher diversion rates.
- the contamination rate of the Green Bin materials from the pilot area was measured twice and is about 3%. This is significantly "cleaner" than Green Bin programs that allow plastic bags
- incoming Green Bin materials met feedstock (chemical/physical) characteristics required to make top quality compost (e.g., unrestricted use in Ontario.)

*Total Waste Diversion*

- total waste diversion for the pilot project was estimated at 60% to 65% when all quantities of Green Bin materials, recyclable materials and estimates for other services (e.g., yard materials collection, electronics recycling, etc.) are included
- the diversion rate of 60% to 65% can be compared with the overall 50% diversion rate experienced across London for single family homes.

Pilot Project – Survey Results

Residents were formally surveyed by Nordex Research (October, 2012) about their views on the Green Bin Pilot Project. The full survey results can be found at the end of Appendix D. Below are some results of the survey:

- the program was supported by 73% of respondents and opposed or criticized by 21% respondents (6% did not offer answer or were ambivalent); It is important to note that this survey question (result) came before the survey question associated with Green Bin program costs
- 80% placed materials in the Green Bins daily
- 12% reported cleaning the Green Bins was a problem
- 70% found the size of the containers (Green Bin/kitchen catcher) was just right
- 39% reported they would pay extra for the program, 23% said maybe, 35% said they would not, and 3% were unsure

Pilot Project – Other Resident Feedback

Staff received many informal comments (calls, emails) during the Pilot Project which are summarized below:

- resident feedback (non-solicited) included both positive and negative comments regarding the Green Bin:
    - Positive comments: same day collection, Green Bin reduces waste, and able to compost materials not acceptable for backyard composters (e.g. meats)
    - Negative comments: not interested because of age, managing wet waste without plastic bags was problematic – the YUK factor; no room to store bin
- there were few negative complaints expressed directly to staff about bi-weekly garbage collection in the winter. It is interesting to note that not one household, including those that did not participate in the Green Bin Pilot Project, demanded the normal collection service during winter months.

Pilot Project - Operational Learnings

Operational learnings from the pilot project are summarized below:

- at the start of the Pilot Project, 40% of residents selected the smaller Green Bins that can be emptied by hand; 60% of residents selected the larger Green Bins carts which require a cart tipper on the truck. Very few households changed their Green Bin for a different size during the Pilot Project
- collection time for the sanitation operators increased by 40% for garbage and Green Bin compared to garbage only
- most residents did not use liners

### D.3 Estimated Quantity of Compostable Material

Appendix B contains estimated waste composition data based on audits conducted in London in 2012/2013. These data were used to estimate the quantity of compostable waste material in garbage that is collected curbside. It is estimated there is approximately 26,000 tonnes of compostable material in curbside garbage (See Table D-2, next page)

***Table D-2 Residential Curbside Waste Composition – Focus on Compostables***

| ***Material*** | ***Quantity*** | | ***Comments*** |
|---|---|---|---|
| | ***(tonnes)*** | ***%*** | |
| *Food Waste* | *22,000* | *37* | |
| *Yard Waste* | *1,000* | *3* | |
| *Compostable Paper* | *3,000* | *5* | *e.g. Tissue, towels, etc.* |
| Subtotal Compostables | 26,000 | 45 | Total curbside organics available |
| Other Curbside Materials | 32,000 | 55 | Excludes bulky items |
| Total Curbside Garbage | 58,000 | 100 | |
| Total Residential Waste | 154,000 | | Includes curbside & multi-residential garbage and recyclables, yard materials and on-site management (e.g. backyard composting) |

## D.4 Program Benefits and Opportunities

The environmental, social and financial benefits of a city-wide Green Bin program can be estimated based on experience from other Ontario and North American jurisdictions coupled with experience from the Green Bin Pilot Project. These are summarized below.

Environmental Benefits

1. *Reduced Greenhouse Gases*

Diverting organic waste has the benefit of reducing greenhouse gas production and associated climate change impacts. It is estimated that greenhouse gases could be reduced by 10,000 tonnes per year or the amount equivalent to removing 2,500 cars from the road.

2. *Closer to Provincial Goal of 60% Waste Diversion*

Implementing the Green Bin program and other waste diversion initiatives will be necessary for London to reach the provincial 60% waste diversion target. It is estimated that the Green Bin program will increase our diversion rate by 8% to 9%.

Reaching the provincial goal of 60% will be an important consideration in the MOE approval of expanding London's landfill and it is anticipated that approval would not be granted unless programs to reach 60% waste diversion are implemented.

3. *Additional Landfill Capacity*

It is estimated that if a Green Bin program was implemented it would divert 12,000 to 14,500 tonnes each year. This would extend the life of the W12A Landfill by approximately 8 months. This delays the need for a new landfill and taking additional farmland out of production.

4. *Reduced Landfill Impacts*

Reducing the amount of waste to the landfill would reduce nuisance impacts from the W12A landfill such as reduced truck traffic, litter, noise and odours.

5. *Better Use of Material*

Materials collected from the Green Bin Program would be turned into useful products instead of being landfilled. If the material were composted, it would result in the production of approximately 350,000 bags of compost with a market value of between $700,000 and $1.1 million. Other technologies (e.g. anaerobic digestion) allows for the production of energy and a compost like product from the collected materials.

<u>Social benefits</u>

6. *Jobs*

A Green Bin program would create jobs locally and outside London, compared to landfilling. It is estimated that the Green Bin program would result in a net increase of 10 to 20 jobs as compared to landfilling organics.

7. *Consistent with other Municipalities*

London and Windsor are the only remaining larger Ontario municipalities that have not approved or already implemented a Green Bin program. It must be recognized that neither of these jurisdictions have faced a waste disposal crisis due to well planned integrated waste management systems in place.

Financial Benefits

8. *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 is estimated to be approximately $35 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 that 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 $180,000 to $290,000 per year. The majority of these savings would be in capital costs which would reduce the annual contribution from general taxes required for the Sanitary Landfill Reserve Fund.

9. *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 Ministry of the Environment would be unlikely unless the City has programs in place to reach the provincial goal of 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 $6,000,000 to $10,000,000 per year.

## D.5 Potential Issues and Challenges

1. *Low Participation Rate*

Green Bin programs typically have low participation rates (about 50 to 60%) compared to the Blue Box programs (90%). This has resulted in some municipalities (e.g., Ottawa, Waterloo) not collecting the quantity of material they were expecting from households after they started Green Bin programs.

2. *Processing Facility Problems*

Some processing facilities accepting Green Bin material in Ontario and other parts of Canada have experienced processing issues such as odours. The problems can reflect badly on the Green Bin program.

3. *Yuk Factor*

Participants in the pilot project area were asked why they were satisfied or dissatisfied. Many who reported they were dissatisfied said it was because of odours/maggots/flies associated with keeping the food waste for a week.

4. Lack of Provincial or Industry Funding to Offset Program Costs

Unlike the Blue Box program there is no provincial or industry funding to offset program costs.

The Blue Box program receives funding equal to approximately 50% of net program costs. No such program exists for organics nor is one expected in the future. The proposed MOE Waste Reduction Strategy highlights that Green Bin Programs are going to be addressed in year 4 or beyond of the strategy but provides no indication if funding is part of a future strategy.

5. Cost of Green Bin Program

A Green Bin program will cost approximately $2.9 million per year. Organics will need to be collected weekly so a further $1.2 million will be required to provide matching weekly garbage and recycling collection. These additional costs will be borne by all taxpayers (single family, multi-residential, commercial, industrial, agricultural, etc.) and not just the homes receiving the service.

Some homes receiving the Green Bin service may be opposed as they already home compost and will not want to pay for a program they do not need.

**D.6 Summary of Green Bin Programs in Ontario**

Status of Green Bin Programs in Ontario

Most Green Bin programs in Ontario are similar to London's pilot project in that they:

- do not allow pet waste, diapers or sanitary products
- do not allow Green Bin materials to be placed in plastic bags

**2011 Ontario Green Bin Programs**

(2012 data from Waste Diversion Ontario is not available until late 2013)

- 20 plus programs in Ontario
- Service provided to 3.5 million homes or 70% of Ontario households
- 400,000 tonnes diverted in 2011

- provide weekly collection

The most common issues/concerns with the programs in other municipalities are:

- Liquids leaking from collection vehicle
- Green Bin material freezes in bin
- Strong odours from Green Bin materials
- Broken Green Bins in winter
- Trouble accessing Green Bins because of parked cars
- Pests (maggots, flies)
- Operational problems (e.g., odours) with processors

Details of all Green Bin programs in the Ontario are provided in Tables D-3 and D-4.

**D-3: Ontario Green Bin Programs – Operational Detail**

| Municipality/ # Households Eligible for Service | Container Size (litres) | Allowable liners | Collection Details | | | Collection Issues |
|---|---|---|---|---|---|---|
| | | | SSO | Garbage | Leaf/Yard Top Up | |
| **Municipalities allowing plastic bags, sanitary products and pet waste** | | | | | | |
| Toronto 529,000 | 46 litre | Plastic | Weekly | Bi-Weekly | No | • Leachate leaks from collection vehicle |
| York Region 287, 000 | 46 litre | Paper or certified compostable mandatory; currently no enforcement (no leave behind policy) | Weekly | Bi-Weekly | No | • Leachate leaks from collection vehicle<br>• SSO freezes in bin<br>• Loose organics in bin not emptying<br>• Broken bins in winter |
| **Municipalities not allowing plastic bags or sanitary products** | | | | | | |
| Barrie 45,200 | 46 litre | Paper or certified compostable | Weekly | Weekly | No | • Leachate leaks from collection vehicle<br>• SSO freezes in bin |
| Durham 189,000 | 46 litre | Paper or certified compostable | Weekly | Bi-Weekly | No | • Leachate leaks from collection vehicle<br>• SSO freezes in bin<br>• Overweight bins |
| Guelph 37,000* | 80 litre | Paper or certified compostable | Weekly | Bi-Weekly | Yes | • None |

Table D-3 continued on next page

### D-3: Ontario Green Bin Programs – Operational Detail (continued)

| Municipality/ # Households Eligible for Service | Container Size (litres) | Allowable liners | Collection Details | | | Collection Issues |
|---|---|---|---|---|---|---|
| | | | SSO | Garbage | Leaf/Yard Top Up | |
| Hamilton 152,000 | 46 litre downtown 120 litre | Paper or certified compostable | Weekly | Weekly | Yes | • Leachate leaks from collection vehicle<br>• SSO freezes in bin<br>• Strong odours from SSO<br>• Broken bins in winter<br>• Parked cars<br>• Pests (maggots, flies) |
| Halton Region 146,000 | 46 litre & 360 litre for some townhouses | Paper or certified compostable | Weekly | Bi-Weekly | No | • Leachate leaks from collection vehicle<br>• SSO freezes in bin<br>• Broken bins in winter |
| Kingston 43,000 | 46 litre downtown residential 80 litre | Paper bags | Weekly | Weekly | Yes | • SSO freezes in bin |
| Niagara Region 166,000 | 46 litre (single and multifamily) 80 litre (small business) | Paper or certified compostable | Weekly | Weekly | Yes | • Leachate leaks from collection vehicle<br>• SSO freezes in bin<br>• Broken bins in winter |
| Ottawa 263,000 | 80 litre some 47 litre | Paper | Weekly Summer Bi-Weekly Winter | Weekly | Yes | • SSO freezes in bin<br>• Broken bins in winter |
| Ottawa Valley 16,000 | 120 litre | Paper | Weekly | Bi-Weekly | Yes | None |
| Peel Region 323,000 | 46 litre | Paper or certified compostable | Weekly | Weekly Bi-Weekly pilot | Yes | • Leachate leaks from collection vehicle |
| Simcoe County 126,000 | 46 litre | Paper or certified compostable | Weekly | Weekly | No | • Leachate leaks from collection vehicle |
| City of St. Thomas 16,000 | 240 litre | Paper or certified compostable | Bi-Weekly | Weekly | Yes | • Overweight bins |
| Waterloo 134,000 | 46 litre | Paper | Weekly | Weekly | No | • Leachate leaks from collection vehicle<br>• SSO freezes in bin |

## D-4: Ontario Green Bin Programs – Collection and Processing Details

| Municipality/ # Households Eligible for Service | SSO Quantity Collected (2011) (tonnes) | SSO Collected per Household (2011) (kg/household) | Participation Rate % (at least 2 setouts/month) | Processing Facility (Location) |
|---|---|---|---|---|
| **Municipalities allowing plastic bags, sanitary products and pet waste** | | | | |
| Toronto 529,000 | 118,000 | 229 | 89% | Orgaworld (London) LaFleche (Moose Creek) All Treat Farms (Arthur) |
| York Region 287, 000 | 92,000 (only 59,000 sent for processing as processors experienced challenges resulting in a portion of SSO not being processed). | 205 (processed) 320 (generated) | Region wide-85% | Orgaworld (London) LaFleche (Moose Creek) |
| **Municipalities not allowing plastic bags or sanitary products** | | | | |
| Barrie 45,200 | 2,697 | 60 | Average - 34% Established areas -47% New areas – 27% | All Treat Farms (Arthur) |
| Durham 189,000 | 26,866 | 142 | 65-70% | Durham Region (Miller Compost) |
| Guelph 37,000* | 10,700 | 288 | 100% City of Guelph has a bylaw making it mandatory to separate waste into 3 streams | City of Guelph |
| Hamilton 152,000 | 34,957 | 230 | 75% | City of Hamilton |
| Halton Region 146,000 | 25,933 | 178 | 70% | City of Hamilton |
| Kingston 43,000 | 3,590 | 84 | 2011-53.6% 2012-56.1% Sept 2012 reduced garbage bag limit by one participation 64.3% | Norterra (Kingston) |

Table D-4 continued on next page

## D-4: Ontario Green Bin Programs – Collection and Processing Details (continued)

| Municipality/ # Households Eligible for Service | SSO Quantity Collected (2011) (tonnes) | SSO Collected per Household (2011) (kg/household) | Participation Rate % (at least 2 setouts/month) | Processing Facility (Location) |
|---|---|---|---|---|
| Niagara Region 166,000 | 11,219 (food waste only) 31,545 (food and yard) | 68 (food waste only) 190 (food and yard) | 2010-2011-41.7% | Walker Brothers (Thorold) |
| Ottawa 263,000 | 55,063 | 209 | 2010-40% | Orgaworld (Ottawa) |
| Ottawa Valley 16,000 | 4,161 | 267 | Participation less than 2x per month due to large bin size | Ottawa Valley Waste Recovery Centre (Pembroke) |
| Peel Region 323,000 | 32,390 | 100 | 2012-37.2% | Peel Region (Brampton, Caledon) |
| Simcoe County 126,000 | 10,968 | 87 | 2011 Winter-65% Spring-61% Summer-56% Fall-59% | City of Hamilton |
| City of St. Thomas 16,000 | 3,239 | 202 | Not available | Orgaworld (London) |
| Waterloo 134,000 | 9,521 | 71 | Not available | City of Guelph |

**Nordex Research Report**

*Introduction*

Nordex Research was commissioned in October 2012 by the Environmental Programs & Solid Waste division of the City of the London to carry out two surveys: 1) a survey of participants in a pilot program of green bin (compost collection) services in the Glen Cairn area of the City (southeast London), and 2) a survey of non-participating, default respondents who had rejected participating in the green bin program. The second group would be surveyed on a new seasonally-adjusted schedule of regular garbage collection highlighting weekly summertime, same day, collections and wintertime, same day, 2-week collections also in Glen Cairn. The pilot program lasted from October 2011 to early November 2012 (Nov. 6th). Nordex surveyed respondents in the last week of the program on October 29, 30 and November 1.

The purpose of the surveys was to tap into the experience, behaviour and preferences of respondents on both services. Since the client felt comfortable about base-level knowledge on the behaviour of program participants, there was some attempt to move to the next step in these surveys i.e. to canvass explanations for such behaviour. And so, there was an experimental quality to some questions in these surveys that is normally not pursued i.e. we asked questions about causal behaviour. For the most part, when these questions were reined in and we asked for concrete, easily knowable linkages by respondents we achieved the expected moderately good results from our efforts.

*Methodology & Sampling*

The client's targeted population in Glen Cairn area numbered 763 households. Of this group, 442 households – according to the client's data -- agreed to participate in the green bin pilot project (57.9%) and 321 became default participants in the seasonal garbage scheduling program (42.1%).

Up to **338 green bin participants** offered the client telephone contact information or it was obtained by Nordex through resort to a community directory. It turned out that Nordex was able to secure 35 additional telephone numbers beyond the client's initial telephone list. Upon completing the green bins survey, it also turned out that 40 telephone numbers were non-operational for various reasons. This left us with an actual sample frame

of 298 households. We **interviewed 163 individuals** for the green bins survey and thus achieved a response rate of 54.6%.[1]

On the scheduling survey, **229 default participants** offered telephone numbers for contact purposes, but 30 of these numbers were invalid for several reasons, thus granting us a sample frame of 199. We **interviewed 80 individuals**, thus granting us a 40.2% response rate.[2]

Methodologically, the client's sample frame and targeted survey population indicated that a "selected" sample of respondents was available to Nordex for both surveys. Random sampling was not called for, nor available to us. With selected samples, sampling errors cannot be calculated. Only random sampling produces sampling errors. On the other hand, the proposed selected sample frames produced data sets that represented 55% of available green bin participants, and 40% of available, default seasonal scheduling program participants. These figures made both surveys highly representative of their target populations.

*Demographic Profiles*

In typical fashion for surveys of municipal services, baby boomers (ages: 45-64) dominated our surveys. In both surveys, 44% of respondents were baby boomers, 27-29% were Gen X'ers and Generation Y (26-44), and 24-26% were seniors (>65). Women also dominated both surveys, 59-65%, as did retirees, 28-31%, working occupations, 26-35%, and professionals & managers, 22-28%. Almost all green bin respondents were homeowners, and 88% of scheduling respondents were homeowners. The dominant household size for both surveys is 2-4 persons (76-81%). *Almost a majority of green bin respondents come from middle income ($45-*

[1] In our RFP proposal, we suggested to the client that an aggregate target sample size of 200 and a response rate of 60% might be possible for the green bins survey, assuming lots of things went right. We actually obtained 157 initial round completions and 8 additional completions from 35 extra telephone numbers retrieved by Nordex. On our aggregate target sample size of 200, we reached 82% of our target.

[2] In our RFP reply we suggested an aggregate sample size of 100 in this survey and a 38% response rate. As noted we received a 40% response rate. We were able to obtain only one additional number from our supplemental search, which ended up being an out of service number. As a result we did not reach our initial target of N=87 + 13 supplemental completions = N=100, but we did reach N=80 and thus 80% of our target.

*85k/yr.) households (49%), and the leading plurality of scheduling respondents come from lower income (<$45k/yr.) households (40%).*

## Green Bins Survey

*General Satisfaction/Dissatisfaction with the Green Bin Program*

As a general introductory observation, respondents appeared to endorse the green bin pilot program enthusiastically, granting it just less than a 10:1 positive rating. Fully two-thirds of respondents said they were "very satisfied;" up to 9 per cent were dissatisfied. See Table 1.

**Table 1**. In general, how satisfied or dissatisfied are you with the green bin program i.e. the regular activity of depositing food scraps and other material into the green bins for City of London collection and composting? (N=163)

| | | | |
|---|---|---|---|
| very satisfied | 67.5% | N=110 | Ratio: <10:1 |
| somewhat satisfied | 22.7 | 37 | |
| not so satisfied | 3.7 | 6 | |
| not satisfied at all | 5.5 | 9 | |
| don't know/refuse | 0.6 | 1 | |

*It should be noted that this question produced "top of mind" results; respondents were not yet focused on the details of the survey and so they produced an "instant answer" on satisfaction or dissatisfaction – not an unusual outcome given that this query was positioned at the beginning of the interview schedule.*

*Reasons for Satisfaction or Dissatisfaction with the Green Bin Pilot Program*

We then asked the follow-up and open-ended question: "why do you say that?". For this open-ended query, we produced a series of coded responses based on the array of unfiltered raw responses offered to us by respondents. See Table 2. The dominant response supporting those satisfied with the pilot program was the reduction of regular garbage loads (37% of the sample as a whole or 49% of those able to offer an answer). Informally, respondents many times reported they had 50-75% less regular garbage to put out at the curb under

program conditions. Respondents also indicated that green bins and the separation exercise was an "easy" exercise (15% or 20% of those offering an answer); the bins were "easy to use." That something was being done "for the environment" also appealed to some respondents (10% of the whole or 13% of those answering), and so were the "weekly" and "regular" pick-ups of greens bins (8% or 11% or those answering ) – at least in the warm months during the program period.

For those answering in Table 2, almost 21% of responses (34 of 159 responses) were exclusively negative on green bins.[3] Those dissatisfied were most inclined to identify fatigue in coping with and the handling of green bins (7%), particularly on sorting materials and cleaning the green bins. Related to this was dissatisfaction with the stench/odours of rotting food and the sight of maggots (5%). A few others found the whole program a big expense for not much benefit, or simply a waste of time for all concerned (3%). Fewer still cited wildlife intrusions (2%). And even fewer found the green bin containers to be too large or too small.

**Table 2**. Why do you say that? (satisfaction or dissatisfaction (N=163) Ratio: >3:1 on responses (122:37) 7:2, respondents (119:34)[4]

| *Satisfied* | | r | *Dissatisfied* | | r |
|---|---|---|---|---|---|
| 1) (significantly) less garbage | 36.8% | 60 | 1) tired of sorting/cleaning/too much work | 7.4% | 12 |
| 2) easy to use | 14.7 | 24 | 2) rotten food/odours/maggots | 4.9 | 8 |
| 3) good for the environment | 9.8 | 16 | 3) program too expensive/waste of effort | 3.1 | 5 |
| 4) weekly/regular pick-ups | 8.0 | 13 | 4) wildlife intrusions | 2.4 | 4 |
| 5) secure from wildlife | 1.2 | 2 | 5) improper containers/too large/too small | 1.2 | 2 |
| 6) helps recycling | 0.6 | 1 | 6) insects/flies | 0.6 | 1 |
| 7) other | 3.7 | 6 | 7) other | 3.1 | 5 |
| 8) don't know | 4.9 | 8 | 8) don't know | 0.6 | 1 |
| 9) n/a | 20.3 | 33 | 9) n/a | 76.7 | 125 |

When we counted the actual number of concrete positives in Table 2 compared to actual concrete negatives, the program was clearly supported by 119 respondents (73% of respondents), and opposed or criticized

[3] See footnote # 5.
[4] See footnote # 6.

by 34 respondents (21%). Thus, this second-round ratio on satisfaction versus dissatisfaction came in at a 7:2 instead of 10:1.[5] This meant the program still has popular support among respondents, but not overwhelming support as the 10:1 ratio would indicate. And while a 7:2 support is quite good for public policy purposes, demonstrating normally sufficient public legitimacy from a public opinion point of view, it ought to be modestly concerning that 21% of respondents who offered a concrete opinion about the pilot program were not happy with it.

*Integrating the Results from Table 1 and Table 2*

The client has raised the issue of why respondents who seem so satisfied in Table 1 effectively "changed their minds" in Table 2 to reveal that they were less satisfied. The answer is a comparatively large number were not actually "satisfied" in the first place when we scratched the surface or they did not know why they were satisfied, particularly in the "very satisfied" category. And so, while we acknowledge the results of Table 1 the facts are this was a top of mind introductory inquiry positioned as the very first question of the survey and lot of respondents apparently casually responded with "satisfaction" responses that they did not really mean. While we do not intend probe social psychological rationales for this kind of unreliability in first-question responses, we can report that the phenomenon is not entirely atypical in survey research, although in this case the scope of the phenomenon is certainly broader.

Let us now get down to facts and figures. Ten respondents who said they were "very satisfied" in Table 1 could not offer concrete positive reasons for their choices in Table 2 (e.g see the "other" category in Table 2 and those said "don't know.) This meant that 9% of those who said they were "very satisfied" with the green bin could not come up with a good reason for their high satisfaction. This is an unusual result in survey research since respondents typically know very well why they are "very satisfied."

[5] These ratios were calculated by comparing the concrete positive responses to concrete negative responses. We removed from the calculation the "don't knows" and obviously the "not applicable." And so the ratios came in at just over 3:1 on the responses (r=122 vs. r-37) and 7:2 from respondents (N=119 vs N=34), which meant green bins, even when stripped of faux positives and those going negative out of the Table 1 "somewhat satisfied" column still offered the program emergent popular acceptance. As a stand-alone program, without considering questions on the direction and level of financing, green bins remained on the cusp of solid public legitimacy. Later, when we introduced the financing questions, things changed.

In addition, 19 respondents who said they were "somewhat satisfied" Table 1 also could not come up with positive reasons in Table 2; indeed quite the contrary, all 19 respondents actually offered exclusive negatives -- as we describe above. This is the classic "good, but ..." response we often observe in survey research. Respondents say they are "somewhat" satisfied, and what they really mean is the program or service is "ok, but I want to tell you what's wrong with it." And so, on the second round of questioning in response to the "why do say that?" open-ended question the negatives entered the picture in greater numbers. Again, 19 respondents out of 37 respondents who said "somewhat satisfied" in Table 1 offered exclusive negatives in Table 2.[6]

Frequency of Use: Kitchen Container

Up to 80% of respondents indicated they used their kitchen containers designed for the green bin program on a daily basis. Up to 11% used these containers less frequently. See Table 3.

**Table 3**. How often do you use your kitchen (green bin) container for food scraps, if you do? (N=163)

| | |
|---|---|
| daily | 79.7% |
| every couple of days | 7.4 |
| weekly | 3.1 |
| less than weekly | 6.1 |
| don't know or refuse | 2.5 |
| don't use | 1.2 |

[6] Three respondents who said "somewhat satisfied" in Table 1 and who offered negative responses in Table 2 also offered positives in Table 2. We classify these respondents as "ambivalent" and remove them from the list of exclusively positive or negative respondents. Thus we see a reduction on the numbers from total positive and negative responses to total positive and negative respondents and corresponding adjustments on the ratios in Table 2. Two who said green bins were "good for the environment" also said they were "tired of sorting/cleaning greens" [or the whole process was] "too much work," and one respondent said his/her green bin was "secure from wildlife" but the program was "too expensive or a waste of effort."

*Retail (Wholesale) Purchase of Compostable Bags*

A solid majority of respondents purchased compostable bags for their kitchen containers in the retail or wholesale market -- after they received sample bags from the City. A large minority said they did not. See Table 4.

**Table 4**. Have you purchased any compostable bags for your kitchen (green bin) container? (N=163)

| | |
|---|---|
| yes | 55.8% |
| no | 43.6 |
| no green bin | 0.6 |

*Cleaning and Maintenance of Kitchen Containers*

Up to 12% of respondents indicated that they had a problem with cleaning and maintaining their kitchen containers regularly or occasionally; 85% did not have a problem. See Table 5.

**Table 5**. Is regular cleaning and maintenance of the kitchen (green bin) container a problem for you? (N=163)

| | |
|---|---|
| yes | 7.9% |
| no | 84.7 |
| sometimes | 4.3 |
| don't know/refuse | 2.5 |
| no green bin | 0.6 |

*Size of Curbside Green Bins*

Since respondents chose the size of green bins they wanted at the beginning of the program, it stands to reason that most would be satisfied with the size they received. On the other hand, almost one-quarter said their green bin was too big, and 7 respondents said it was too small. See Table 6.

**Table 6**. In terms of the size of the curbside/outside green bin you received, do you find it to be: too big, just the right size, or too small? (N=163)

| | |
|---|---|
| too big | 24.0% |
| just right | 70.5 |
| too small | 4.3 |
| no opinion | 0.0 |
| can't say/refuse | 1.2 |

*Green Bins for Yard Materials or Food Scraps?*

The purpose of the question in Table 7 was to explore how many respondents used their green bins for yard materials "exclusively." It turned out exclusive use of green bins for yard materials was reported by only one respondent. Just over one-third of respondents placed yard materials in their green bins "sometimes." Otherwise, close to two thirds of respondents used the greens bins exclusively for food scraps, which was the primary purpose of the program.

**Table 7.** Some people use the curbside/outside green bin exclusively for yard materials e.g. grass clippings, leaves and yard materials? Do you do the same thing or do you use it exclusively for food scraps? (N=163)

| | |
|---|---|
| yard materials, exclusively | 0.6% |
| yard materials, sometimes | 35.6 |
| exclusively food scraps | 62.6 |
| don't know/refuse | 1.2 |

*Cleaning the Curbside Green Bins*

Up to 18% of respondents cited regular or occasional problems with cleaning and maintaining the green bins; otherwise there were no problems. See Table 8.

**Table 8**. Is regular cleaning and maintenance of the curbside/outside green bin a problem for you? (N=163)

| | |
|---|---|
| yes | 12.3% |
| no | 81.0 |
| sometimes | 5.5 |
| dk/refuse | 1.2 |

*Frequency of Curbside Collections & Obstacles*

More than four-fifths of respondents took their green bins to the curb on a weekly basis. However, in spite of weekly pick-ups, close to one-fifth set out their greens bins less frequently. See Table 9. No respondents indicated that they faced any difficulty taking their green bins to the curb. See Table 10. And so we are left the question: why were one-fifth of respondents resorting to less than weekly pick-ups?

**Table 9.** Do you take your curbside/outside green bin out for City collections on a weekly basis, or less often? (N=163)

| | |
|---|---|
| weekly | 81.6% |
| every 2 weeks | 11.7 |
| every 3 weeks | 3.7 |
| monthly or less often | 2.4 |
| don't know/refuse | 0.6 |

**Table 10**. (If less than weekly in Q 9) Do you experience any difficulty taking your outside green bin to the curb for collections?

| | |
|---|---|
| no | 17.8 |
| n/a | 82.2 |

Difficulty on Curbside Collections Last Winter?

Up to 99% of respondents said they had no problem taking their green bins to the curb last winter. It was, as we recall, a light winter. One respondent indicates there was a "snow" problem. See Table 11.

**Table 11**. Last winter – even though it was a light winter -- did you experience any difficulties taking the outside green bin to the curb? (N=163)

| | |
|---|---|
| no | 98.8% |
| yes | 0.6 |
| no green bin | 0.6 |
| (If yes) What problem? | "snow" |

*Pay Extra for Green Bins?*

By a split 11:10 ratio on the "yes:no" response, respondents were ambivalent about paying extra money for a green bin service. When folding in their "maybe" responses in with the "no's" on the negative side, their opposition comes in at a 3:2 negative ratio. When folding in the "maybe" responses with the "yes" responses, there is a near 2:1 positive ratio for paying extra.

Thus, there was at best modest support in favour of paying extra for green bins and at worst, negative 3:2 opposition. On a straight yes:no response, opinion was split. See Table 12.

**Table 12**. Is there sufficient extra value in a new green bin program to pay extra money for this service? (N=163)

| | | | |
|---|---|---|---|
| yes | 38.6% | yes:no | 11:10 positive |
| no | 35.0 | yes: no+maybe | 3:2 negative |
| maybe | 23.3 | yes+maybe:no | < 2:1 |
| don't know/refuse | 3.1 | | |

*How Much Extra for Green Bins?*

We asked respondents who thought green bins were definitely or possibly worth extra payment in Table 12 to select a price range that would be attractive to them. Two-thirds (64%) of those answering "yes" or "maybe" in Table 12 said they would be willing to pay less than $50.00 annually; more than one-third (37%) said less than $40.00 annually; 20% would pay more than $50.00 annually, and 8% more than $60.00 annually. See Table 13.

Even those saying "yes" in Table 12 tended to be somewhat parsimonious when it came to choosing a payment level; out 63 respondents in this category, 21 said <$40, 18 said $40-50, 8 said $50-60 and 6 could not

form an impression.

On those saying "maybe" in Table 12, they were also quite frugal: of the 38 "maybe" respondents, 10 said <$40, 5 said "nothing," 9 said $40-50, and 10 could not offer a selection.

**Table 13**. (If "yes" or "maybe" in Table 12) How much would you be willing to pay on an annual basis for a permanent green bin program, if you are willing?

| | N=163 | N=100 |
|---|---|---|
| nothing/not willing | 3.7% | 6% |
| <$40.00 | 19.0 | 31 |
| $40-50 | 16.6 | 27 |
| $50-60 | 7.4 | 12 |
| $60-70 | 1.8 | 3 |
| >$70.00 | 3.1 | 5 |
| don't know/refuse | 9.8 | 16 |
| n/a | 38.6 | |

What Service Cuts to Receive Green Bins?

With the question in Table 14, we experienced the ill-effects of calling for causal linkages.[7] Whereas we asked in Table 12 whether there was "sufficient extra value" in the green bins program, would respondents pay

[7] Causal interrogatives are not often pursued in telephone surveys because respondents are not typically capable of answering such questions. It is simply too much to ask them to perform spontaneous "if ... then" calculations, on the spot, in the immediacy of 5-6 minute telephone conversation, particularly when they do not have any time for preparation or are not psychologically prepared to be tested on a question that requires some reflection and perhaps calculations. "If ... then" questions, in effect, ask respondents to link mental objects between two points in time and then explain their "cause and effect." Often the links between objects being considered are too distant or too abstract for ordinary respondents to formulate an answer. They are also often not prepared because do not have the cognitive capability to answer. Again, causal questions in the main ask too much of an ordinary respondent. Further, when respondents are asked to respond to or estimate the "why?" of their own motivations, such queries typically fail. Why? Ordinary individuals are not in a position to judge their own motivations. Subjective estimations of motivation rarely can successfully replace the act of posing objectively-crafted "what" questions on "determinants" of behaviour. From these determinants, often disaggregated, we can make more useful estimates of actual collective motivation or even comparatively-rendered group motivation. However, while questions about subjective motivation rarely work in (telephone) survey research, they can be useful for guidance purposes when looking for qualitative, exploratory research results, and thus they are sometimes used in focus group research. In summary, As Thaler and Sunstein have pointed out in their popular book, Nudge, on this matter of using causal questions, it is knowing the difference between two kinds of thinking that ought to act as our guide: 1) intuitive and automatic thinking and 2) reflective and rational thinking. Automatic responses about known interests and preferences form the typical cognitive architecture for telephone survey research respondents. See also Daniel Kahneman, Thinking, Fast and Slow, 2011.

extra, in the question inside Table 14 we asked as an alternative to paying extra money for green bins, would respondents "give up other city services?"

We received two reactions to this question; neither of them very useful. First, there was a low response to the question in specific terms: did they favour or oppose such an alternative? Instead of answering directly, respondents effectively gave us non-responses and dumped their answers into the highly ambivalent and circumspect "it depends" response category. See below. In fact, two-thirds of those who answered the question dumped their answers into this residual category; they simply dodged the question. As a result, as statisticians say, we got mush, perhaps valid mush, but mush nonetheless. The results of this question are not useful for analytical purposes.

**Table 14**. (If Table 12 "yes") As an alternative to paying extra money for green bin collections, to what extent do you favour or oppose giving up other city service(s) in order to have a green bin program permanently? (N=163)

| | |
|---|---|
| very much favour | 1.8% |
| somewhat favour | 3.1 |
| somewhat oppose | 3.1 |
| very much oppose | 4.9 |
| depends on the service elimination | 25.1 |
| don't know/refuse | 0.6 |
| n/a | 61.4 |
| (What service elimination, if any? | 1) no children's services |
| | 2) police force |
| | 3) libraries |
| | 4) 3-week garbage pick up with green bin |
| | 5) sidewalk plowing in winter |

*Backyard Composting?*

About one-quarter of respondents said they engaged in backyard composting. See Table 15.

**Table 15**. Do you currently engage in backyard composting at your home? (N=163)

| | |
|---|---|
| yes | 25.8% |
| no | 74.2 |

Influence of Green Bins on Backyard Composting

Here we have another causal question, in this case, asking for respondents' subjective responses on how green bins changed behaviour in relation to backyard composting. For the 25% (N=42) who said they pursued backyard composting, just under 60% of this group (N=24) said the green bin program did not change their behaviour. See Table 16. For this to be true, it meant none of these respondents ever previously, for example, placed food scraps in their backyard compost bin or compost pile. However, this conclusion contradicts the evidence we have in Table 10 of the scheduling survey.

**Table 16.** (If yes above in Table 15) How has the green bin program changed the way you do backyard composting, if it has? (N=163)

| | |
|---|---|
| some change | 10.5% |
| no change | 14.7 |
| dk/refuse | 0.6 |
| n/a | 74.2 |

Suggested Changes Occurring:

1) use my own composter
2) now can get rid of bones in green bin
3) stopped using backyard composting (3)
4) yard waste goes to my composter
5) proteins now go in green bin; before in garbage
6) more goes in the green bin
7) no food scraps in compost (2)
8) less garbage
9) use backyard composter less (2)

10) grass in compost; food in green bins

11) less composting in winter (2)

12) compost in summer; green bin in winter

*Future Options for Regular Garbage Pick Up*

In keeping with Londoners' typical preferences for low-priced, low-taxed public services, respondents in this survey favoured inexpensive garbage services. Indeed, a clear majority (51.5%) were happy to accept the new seasonally-adjusted, weekly summertime and biweekly wintertime garbage collection service if it "did not cost the taxpayer any additional money." Similarly, close to 3 in 10 (28.8%) would accept returning to the more established 8-day cycle, representing the base current expenditure for regular garbage services. And, when asked about the more expensive all-year-round, weekly, same day service that would be more expensive, less than one in ten (8.6%) favoured this option. Up to 11% could not decide which option was most appealing. See Table 17.

Table 17. Finally, the City will shortly be considering three scheduling options for regular garbage pick up. Which option do you prefer? (N=163)

- First, weekly summertime and every two week wintertime service that doesn't cost the taxpayers any additional money.
- Second, an all-year round weekly, same day service that is more expensive than the seasonally adjusted one.
- Third, staying with the more established 8-day pick up cycle, which also doesn't cost anything extra?

| | |
|---|---|
| seasonally adjust pick up | 51.5% |
| weekly pick up | 8.6 |
| previous 8-day pick up | 28.8 |
| can't decide | 11.1 |

*Demographics for Green Bins*

We profiled the key demographics in our introductory remarks. The tables below offer more detail on this information.

| Age | | Gender | | Family Income | | Occupation | |
|---|---|---|---|---|---|---|---|
| 18-25 | 3.1% | male | 35.0% | <$45k/yr | 24.5% | prof'l/mgr | 21.5% |
| 26-44 | 28.8 | female | 65.0 | $45-85k/yr | 49.1 | sales | 5.5 |
| 45-65 | 44.2 | | | >$85k/yr | 24.5 | service | 11.6 |
| 66-80 | 20.8 | | | don't know | 1.9 | office | 8.6 |
| >80 | 3.1 | | | | | constr'n/trades | 3.7+ |
| | | | | | | factory | 2.5 |
| Residence | owner | 97.5% | renter | 2.5 | | technical | 3.1 |
| | | | | | | student | 1.8 |
| Household Size | one= 11.0% | two=38.7 | 3-4=42.3 | >4=8.0 | | homemaker | 7.4 |
| *Thirty per cent of retirees are baby boomers | | | | | | retired | 28.2* |
| +Thirty-five per cent of respondents are in non-prof'l, non-mgt working occ's | | | | | | unemployed | 2.5 |
| | | | | | | disabled | 1.2 |
| | | | | | | other | 1.8 |
| | | | | | | dk/refuse | 0.6 |

*Cross-tabulations on General Satisfaction*

We decided to cross-tabulate data from Table 1, the satisfaction/dissatisfaction question with all other questions. This exercise produced the following statistically significant results. Those who were "very satisfied" with the green bins program were inclined to:

- be daily users of kitchen containers;
- not distinguish on the size of curbside green bin between "too large" and "just right";
- be weekly and every 2-week distributors to the curb;
- make no distinction on the extra value of green bins in order to pay extra money;

- favour the low-end $40-50 and <$40 annual payments categories for a new green bin program;
- say "it depends" on the matter of cutting services to obtain a green bin program, and
- be baby boomers primarily, but also Gen X'rs and early seniors, 66-80.

*Summary Analysis*

There were four critical questions posed in this survey, the results of which centrally aided our knowledge about the potential for a green bin program in London. See Tables 1, 2, 12 and 13.

Table 1 results indicated that there was a 10:1 approval ratio on general satisfaction with the green bins pilot program. This was an early and tentative demonstration of very high support.

When we asked about the specifics of satisfaction and dissatisfaction in Table 2, the approval for the program based on specific answers on both sides dropped to slightly over a 7:2 ratio; a demonstration of popular support, but not overwhelming support, as suggested by the 10:1 ratio.

Table 12 then raised the issue of "sufficient extra value" for a greens bin program in order "to pay extra money for the service," and on this score "yes:no" responses dropped to a split 11:10 ratio. When the "maybe" responses were combined with "yes" responses the ratio rose to just less than 2:1. When "maybe" responses are combined with "no" responses the ratio declines to a 3:2 negative. And so, we experience some modest ambiguity.

Finally, we asked the "rubber meets the road" question in Table 13. For those saying "yes" or "maybe" in Table 12, we asked what dollar amount respondents would be willing to pay extra for green bins on an annual basis. The choices ranged from nothing and less than $40/yr. to more than $70/yr.. Up to two-thirds of those answering "yes" or "maybe" said they would pay less than $50/yr.; 37% said <$40/yr[8]; 27% said $40-50/yr.. The remainder i.e. 15% would be willing to pay $50-70/yr., and 5% would be willing to pay more $70/yr..

[8] When respondents said "<$40/yr." they meant it; <$40 meant something negligible; closer to "zero dollars" than $40.00.

Even for those saying "yes" in Table 12, they tended to be somewhat parsimonious when it came to choosing a payment level. Out of 63 respondents in this category, 21 said <$40, 18 said $40-50, 8 said $50-60, and 6 could not offer an answer. For those who said "maybe" in Table 12, they were also quite frugal. Of the 38 "maybe" respondents, 10 said <$40, 5 said "nothing", 9 said $40-50 and 10 could not offer a choice.

In summary, respondents were happy to offer good intentions up-front, saying yes to a "free" service – actually paid for by other taxpayers – but then became very frugal on the business of personally and directly paying for the service.

## Garbage Scheduling Survey

*Satisfaction/Dissatisfaction with Seasonally-Adjusted Regular Garbage Collections*

In general, respondents were quite satisfied with the seasonally-adjusted garbage pick up schedule they experienced from October 2011 to November 2012. By a 4:1 ratio, they offered their stamp of approval; indeed, a solid majority were "very satisfied," while just under 19% said they were dissatisfied. See Table 1.

**Table 1**. Your area of the city is a test case for determining the acceptability of weekly, summertime, same day garbage pick up and every two week, wintertime, same day pick up. In general, how satisfied or dissatisfied are you with this seasonally adjusted garbage pick-up schedule? (N=80)

| | | |
|---|---|---|
| very satisfied | 55.0% | Ratio: 4:1 positive |
| somewhat sat. | 25.0 | |
| not so satisfied | 12.5 | |
| not sat. at all | 6.25 | |
| don't know | 1.25 | |

However, again, it must be noted that this response is "top of mind;" it does not offer anything other than a quick and unreflective introductory response.

*Reasons for Satisfaction/Dissatisfaction on Seasonally-Adjusted Garbage Collection*

As in the green bins survey, we asked the follow-up, open-ended question: "why do you say that?" in Table 2 on the matter of satisfaction and dissatisfaction. We again coded the raw responses coming from respondents.

Upon entering the positive and negative categories in Table 2, we compared the number of concrete positive descriptors to the number of concrete negative descriptors. Respondent support dropped from a 4:1 approval in Table 1 to slightly less than a 3:2 approval (N=32:22) in Table 2.

Moreover, each of the single factors indicating positive support or negative criticism registered at low orders of magnitude, most being in the single digits. There was also a high "don't know" factor on the positive side of "reasons for satisfaction." And an additional 29% of responses were categorized as "unspecified positives," or their answers had to be placed in the "other" category given their vagueness or irrelevance. So, close to three-quarters of respondents on the positive side of this query gave us non-responses, no discernible or unclear responses. The rest said "same day service, weekly service and the seasonal cycle" was just fine.

In the negative column appearing in Table 2, 17 respondents could offer a clear expression of their dissatisfaction, and no respondent said "don't know." The whole group of those offering negatives was 28% of the sample. See Table 2.

**Table 2**. Why do you say that? (N=80) Ratio: <3:2 of responses

| Positive | | r | Negative | | r |
|---|---|---|---|---|---|
| 1) same day service | 8.75% | 7 | 1) want weekly year round service | 7.5% | 4 |
| 2) liked weekly, summer service | 5.0 | 4 | 2) 2/wk cycle too long in winter | 7.5 | 6 |

| | | | | | |
|---|---|---|---|---|---|
| 3) 1/wk & 2/wk cycles fine | 5.0 | 4 | 3) odours/stench | 2.5 | 2 |
| 4) unspecified positive | 8.75 | 7 | 4) City keeps changing schedule | 2.5 | 2 |
| 5) other | 12.5 | 10 | 5) winter wildlife intrusions | 2.5 | 2 |
| 6) don't know | 33.75 | 27 | 6) space problems in 2/wk cycle | 1.25 | 1 |
| 7) n/a | 26.25 | 21 | 7) unspecified negative | 1.25 | 1 |
| | | | 8) other | 5.0 | 4 |
| | | | 9) n/a | 70.0 | 58 |

From our detailed review of the data, the top of mind responses recorded in Table 1 began to soften in Table 2, and so the 4:1 rating suffered some debilitation. For example, for those who said they were "very satisfied" (N=44) in Table 1, 18 of these respondents in Table 2 could not offer other than a non-response (e.g. "don't know") on why they were "very satisfied." Thus, 41% of the so-called "very satisfied" found themselves bereft of reasons for their satisfaction. Similarly, 8 respondents out the 20 who said they were "somewhat satisfied" in Table 1offered a negative response in Table 2. And 2 of these respondents indicated they were overall ambivalent as they offered a positive descriptor along with their negative descriptor in Table 2. Thus, 30% (N=6) of the so-called "somewhat satisfied" revealed themselves to be exclusively dissatisfied when we probed further in Table 2.

*Experience with the 2-Wk Cycle: Length of Time on Pick Ups Last Winter*

A clear majority of respondents found the 2-week cycle on garbage pick ups last winter to be "just right." On the other hand, a large minority found the 2-week cycle to be "too long" (41%). The positive ratio on "just right" or "too long" is about 4:3. See Table 3.

**Table 3**. How did you find the two week cycle for garbage pick up last winter? Would you say the two-week wintertime cycle was: (N=80)

| | |
|---|---|
| too long | 41.25% |
| just right | 56.25 |
| too short | 1.25 |

don't know/refuse 1.25

*Problems with Odours?*

Three-quarters of respondents declared "no problem" on the issue of odours in relation to 2-week collections last winter.[9] Up to 7% said there were "major problems"; 11% said there were "moderate problems," and 9% said there were "small problems." See Table 4.

**Table 4.** Do you recall if you had problems with odours coming from your garbage during the two-week cycle last winter? Were these odours a major problem, a modest problem, a small problem, or no problem at all? (N=80)

| | |
|---|---|
| major problem | 7.5 |
| modest problem | 11.25 |
| small problem | 8.75 |
| no problem | 72.5 |

Sources of Odours

As expected, the primary source of odours came from food scraps. See Table 5. But as noted, close to three-quarters of respondents said they faced no odour problem last winter, a data result that is likely contaminated by historical memory error.[10] See Table 5.

**Table 5.** (If Q 4 1-3 above) During the 2-week cycle in the winter months, on the problem of odours, what was usually the source(s) of that problem? (N=80)

| | |
|---|---|
| diapers | 3.75% |
| food scraps | 18.75 |
| kitter litter | 0.0 |

[9] While we have no direct, empirical evidence to challenge the quiescence of respondents on this matter, the client needs to be reminded that historical memories are somewhat to very unreliable.

[10] It is always a challenge in telephone survey research to capture anything approaching reliable data when respondents are asked to recall some obscure condition or apprehension of an event months after it has occurred. Historical memories are never going to be sufficiently reliable, and they appear not to be reliable in this case.

| | |
|---|---|
| dog waste | 0.0 |
| can't say | 3.75 |
| no odour problem | 1.25 |
| n/a | 72.5 |

Importance of Weekly, Same Day Blue Box Pick Ups

A solid majority of respondents considered the more frequent weekly pick up of blue boxes to be "very important." Indeed, they offered just less than a 4:1 salience ratio on this more frequent service. About one-fifth of respondents did not think weekly pick ups were important. See Table 6.

**Table 6.** Your blue box (recycling) pick up is now once a week on Thursdays. How important to you is this more frequent pick up service? (N=80)

| | | |
|---|---|---|
| very important | 55.0% | Ratio: < 4:1 |
| somewhat important | 23.75 | |
| not so important | 12.5 | |
| not important at all | 8.75 | |

Frequency Change for Recycling Influence by Week Pick Ups

Twenty-five per cent of respondents said they recycled more with the weekly blue box service; 75% said their use of the blue box(es) did not change.[11] See Table 7.

Table 7. Do you find that you recycle more, less, or just same amount of materials into the blue box when it is picked up on the more frequent weekly schedule? (N=80)

[11] Here we have another causal question. In this case, the client wanted to know if the frequency of recycling involving blue boxes changed because of the weekly schedule. Typically respondents are not fully capable of objectively observing their own "change" behaviour. Better to have asked them about their current behaviour at two or more points in time i.e. before and after some event or turning point. The problem arises because any attempt to ask them to make observations for which vested personal interests may be in play cannot be successful. In this case, it is not entirely clear why more materials would be "blue-boxed" just because the service is on a 7-day cycle versus an 8-day cycle, which the rest of the city experienced. Presumably, the rationale for more recycling would be the motivation and action on distributing more recyclables from the regular garbage to the blue box. But again, why would significant numbers of dedicated or disciplined blue-boxers deliberately place recyclables in the regular garbage – unless they regularly ran out of space in the blue box, and maybe that was so. However, if this is reason, would this apply to a full 25% of respondents as indicated in Table 7 -- unless some version of Hawthorne Effect is in operation. Nordex is sceptical of the 25% figure in Table 7.

| | |
|---|---|
| more | 25.0% |
| less | 0.0 |
| just the same | 75.0 |

*Paying Extra for Weekly Garbage & Blue Box, Same Day Pick Up?*

Respondents were essentially split (5:4) in the negative against paying more for weekly, same day, regular garbage pick ups. They were also somewhat more negative, by a 2:1 ratio, against paying more for weekly, same day, blue box service.

Our results in Table 8 on paying more for weekly, same day garbage collection are reflected almost precisely in the results of a similar question in Table 12, favouring more expensive weekly, same day garbage service. We draw equivalence between the "very much favour" results in Table 8 and the "weekly pick up" results in Table 12.

Returning to the aggregate data in Table 8, we also note that opinion is polarized on paying more for weekly, same day service; respondents are inclined to be strongly in favour or strongly opposed to extra payments.

**Table 8**. To what extent do you favour or oppose paying an extra $10.00, annually, for weekly, same day, regular garbage pick up, and another $10.00 extra for weekly, same day blue box pick up? (N=80)

| | Very much favour | Somewhat fav | Somewhat Oppose | Very much opp. | DK | Ratio |
|---|---|---|---|---|---|---|
| garbage pick up | 32.5% | 11.25 | 25.0 | 31.25 | 0.0 | >5:4 neg |
| blue boxes | 23.75% | 8.75 | 33.75 | 33.75 | 0.0 | >2:1 neg |

*Backyard Composting?*

Up to 30% of respondents said they engaged in backyard composting at their homes. See Table 9.

It is curious to note that in percentage terms more respondents in the non-green bin, default group, i.e. those refusing to participate in the green bin pilot program, said they composted in their backyards, compared to green bin participants. Presumably, some backyard composters prefer the do-it-yourself approach over the more organized, perhaps institutional, city service.

**Table 9.** Do you currently engage in backyard composting at your home? (N=80)

| | |
|---|---|
| yes | 30.0% |
| no | 70.0 |

Protein in the Compost Pile

Nine respondents said they placed meat and bones in their backyard compost pile. See Table 10.

**Table 10.** (If yes above in Q 9) Do you discard meat and bones in the compost pile? (N=80)

| | |
|---|---|
| yes | 7.5% |
| no | 17.5 |
| sometimes | 3.75 |
| don't know/refuse | 1.25 |
| n/a | 70.00 |

Composting in Winter?

Seventeen respondents said they pursued backyard composting in winter. See Table 11.

**Table 11**. (If yes in Q 9) Do you compost in the winter?

| | |
|---|---|
| yes | 21.25% |
| no | 1.25 |
| don't know/refuse | 7.5 |
| n/a | 70.0 |

*Future Options for Regular Garbage Pick Up*

Surprisingly, more default/scheduling respondents (34%) who also have lower incomes are more likely to favour the more expensive weekly, same day, garbage service compared to their green bin counterparts. See Table 12. Having noted this, the leading plurality of respondents in this question (44%) favoured the less expensive seasonally-adjusted garbage collection service. The more established 8-day service was favoured by just over 20%. Only one respondent could not decide which service s/he favoured.

**Table 12**. The City will shortly be considering three options for garbage pick up. Which option do you prefer?

- First, weekly summertime and every two week, wintertime service that doesn't cost the taxpayers any additional money.
- Second, an all-year round weekly, same day service that is more expensive than the seasonally adjusted one.
- Third, staying with the more established 8-day pick up cycle, which also doesn't cost anything extra?

| | |
|---|---|
| seasonally adjust pick up | 43.75% |
| weekly pick up | 33.75 |
| previous 8-day pick up | 21.25 |
| can't decide | 1.25 |

*Why Not Green Bins?*

Since our question in this section concerns: "why not green bins?", we must acknowledge that more than 20% of "default" scheduling respondents in this survey claimed they occasionally engaged in green bin activities during the pilot program. Presumably, this means that the weight we place on the other factors should be leveraged up. When we do so, we gain some interesting insight into the kind of opposition presented against the green bin program. See Table 13.

As expected, about one-quarter (24.2%) of objectors were extant backyard composters. Up to 17% of those who did not use green bins said they were distracted by busy lifestyles (17%). And while, "not having kitchen scraps" seems like an implausible excuse for 16% of respondents; on the other hand, large numbers of people in the City dine out at restaurants on a near-daily basis. Not wishing to separate out "unpleasant garbage" is offered by 8% of respondents. (We estimate that the real number is higher.) And a residual group of defiant objectors turned thumbs down on saving the environment and coincidentally submitting to the green bins program (19%).

**Table 13.** Can you tell us why you did not use the City's green bin service for composting over the course of the last year?

| | Actual | Weighted |
|---|---|---|
| already compost in the backyard | 18.75% | 24.2% |
| do not produce kitchen scraps | 12.5 | 16.1 |
| too busy | 13.75 | 17.7 |
| separating garbage is too unpleasant | 6.25 | 8.1 |
| not interested in composting, no real environmental benefit | 15.0 | 19.4 |
| other | 8.75 | 11.3 |
| did use green bins occasionally | 22.5 | |
| can't say | 2.5 | 3.2 |

Demographics

Default respondents in the scheduling survey were more likely to have lower incomes than respondents in the green bins survey, but they were less likely to be employed in non-professional, non-management working occupations. And, there were more professionals & managers in the scheduling survey. There were fewer women in this survey and yet women dominated both surveys. This survey also had more renters than the green bins survey, and so some of these folks would have been ineligible for the green bins survey.

| Age | | Gender | | Family Income | | Occupation | |
|---|---|---|---|---|---|---|---|
| 18-25 | 1.25% | male | 41.25% | <$45k/yr | 40.0% | prof'l/mgr | 27.5% |
| 26-44 | 27.5 | female | 58.75 | $45-85k/yr | 36.25 | sales | 3.75 |
| 45-65 | 43.75 | | | >$85k/yr | 21.25 | service | 8.75 |
| 66-80 | 20.0 | | | don't know | 2.5 | office | 1.25 |
| >80 | 6.25 | | | | | constr'n/trades | 7.5 |
| refuse | 1.25 | | | | | factory | 3.75 |
| Residence | owner | 87.5% | renter | 12.5 | | technical | 1.25 |
| | | | | | | student | 0.0 |
| Household Size | one= | 13.75% | two=38.75 | 3-4=37.5 | >4=7.5 dk=2.5 | homemaker | 11.25 |
| | | | | | | retired | 31.25 |
| | | | | | | unemployed | 1.25 |
| | | | | | | disabled | 1.25 |
| | | | | | | dk/refuse | 1.25 |

*Salient Demographic Cross-tabulations*

Gen X'rs/Gen Y (26-45) and baby boomers (45-65) were notably inclined to think weekly blue box collections as "important." However, baby boomers were statistically significant in opposing extra annual fees for blue boxes.

Professionals, managers and retirees were more inclined than the sample as whole to think garbage odours were not a problem last winter during the 2-week garbage collection cycle. They were similarly more inclined than the sample as whole to think weekly blue box pick ups as "important." However, retirees were statistically inclined to be "very much opposed" to paying extra for blue box service on an annual basis.

*Summary Analysis*

Consistent with the green bins summary analysis, there were also four critical questions posed in the scheduling survey. See Tables 1, 2, 8a and 12 featuring evaluation results on the seasonally-adjusted regular garbage schedule.

Again, we started with a general satisfaction question, the results of which were somewhat more modest coming in at a 4:1 approval ratio on the seasonally-adjusted garbage schedule (Table 1). Next, we acknowledge the results in Table 2, which offered concrete aspects of satisfaction and dissatisfaction. And, at this juncture in our developmental research we observed a reduction in support down to a 3:2, which cannot be regarded as "passable" support. Table 8a is next, on favouring or opposing a payment of an extra $10/yr. for weekly, same day, garbage collection, and respondents settled in at just over a 5:4 negative ratio. So at this point the seasonal garbage schedule program is "under water," at least on the matter of paying extra for weekly, same day service. Finally, Table 12 indicated that respondents in the aggregate would not accommodate "additional tax or user fee increase" options. They favoured, by a 2:1 margin, the seasonally-adjusted service (44%) or the more established 8-day service -- with statutory holiday interruptions (22%) -- versus the more expensive weekly, same day service (34%). (It is notable, nonetheless, that our less affluent default respondents – those mainly occupying the lower middle class -- were more 4 times more bullish about spending money on the weekly, same day, garbage service than green bin respondents, who mainly occupy the more affluent middle class.)

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# Appendix E
# Home Composting Pilots

**Table E-1 – Home Composting Pilot Project**

| Location | Northridge (south of Fanshawe, east of Adelaide) | Old South (east of Wellington) |
|---|---|---|
| Households | 1,200 | 700 |
| Timing | Summer 2010 | Fall 2011 (one-time-only event) |
| Strategy | Convenience, a very low cost and 'meet and greet' discussions with residents:<br>• Assembled & delivered to the home<br>• Direct encouragement and interaction | Local community sale of 3 different units at low cost<br>• Pre-order and pick up at local community school (convenient location, but one-time-only sale)<br>• Not assembled |
| Compost Units & price | • 'Earth Machine' same unit as supplied at City Depots<br>• $10 | • 'Earth Machine', Rotating unit, 'Green Cone' (digester)<br>• $20 |
| Promotion | • Flyer delivered door-to-door<br>• Promoted again during the door-to-door visit (mid-summer) | • Flyer delivered door-to-door |
| Participation | • 13% (160 households) purchased composters | • 3% (25 households) purchased composters<br>• Approximately 50% of the units sold were the rotating barrel units |

The Northridge Pilot also included door-to-door visits of residents in August 2010 to obtain feedback. The approach used was not designed to be statistically valid nor was it designed to be a survey. The desire was for direct engagement with a City representative about their home composting routines.

Feedback information was compiled from 40% of the households (about 500 homes). Summary findings included:

- 60% indicated they had home composters (on average 1.5 composter per household)

- 45% indicated they were actively composting (i.e., using their composter at least weekly)
- 5% of the homes that participated were new to home composting the remaining 8% were already home composting

Initial estimates suggest that an additional 500 to 2,000 tonnes of food scraps could be diverted (up to 1.5% increase in overall diversion) with an aggressive home composting program modeled on the Northridge pilot project. Similarly, initial estimates suggest that less than 1,000 additional tonnes would be diverted (less than 1.0% increase in overall diversion) with a home composting program modeled on the Old South pilot project.

# Appendix F
# Potential Materials to be Added to the EnviroDepots

**Introduction**

The existing EnviroDepots are popular destinations which provide a convenient "one stop drop" location for residents to dispose of a variety of materials.

A review of other municipalities in Ontario found eight materials that could potentially also be managed at the depots.

These materials are:

1. Vegetable Oil (expand from one to three locations)
2. Used Motor Oil (expand from one to three locations)
3. Expanded Polystyrene (e.g., meat trays, foam cups, packaging materials)
4. Unused Paint (expanded from one to three locations)
5. Mattress
6. Carpets
7. Film plastic (e.g., plastic bags)

The financial, environmental and social considerations as well as technical issues of adding these materials to the City's Depot program are presented in tables F-1, F-2 and F-3.

In summary, the following materials should be considered to be added to the Oxford and Clarke Road EnviroDepots in 2014 given these initiatives are relatively low cost and are expected to have public support: vegetable oil and used motor oil.

The following materials require further investigation before a final recommendation can be made with respect to adding them to the EnviroDepot Program: paint; expanded foam polystyrene (e.g., meat trays, foam cups, packaging materials, furniture and mattresses.

The following materials are not recommended to be added to the Blue Box Program: film plastic (e.g., plastic bags.

**Table F-1: Overview of Key Environmental, Social & Financial Considerations and Technical Issues of Materials Recommended to be Added to the EnviroDepots**

| Consideration | | Material Recommended to be Added | |
|---|---|---|---|
| | | **Vegetable Oil** | **Used Oil** |
| **Environmental** | Estimated Annual Volume Diverted | 4,000 litres (new volume) | 20,000 litres (new volume) |
| | Estimated Annual Units Diverted (a) | Not applicable | Not applicable |
| | Annual GHG Savings Equivalent to (b) | Not available | Not available |
| | Annual Energy Savings Equivalent to (c) | Not available | Not available |
| **Social** | Public Support | • Average | • Average |
| | Resident Issues | • Limited locations | • Limited locations |
| **Financial** | Additional Collection Cost (d) | $0 | $500 |
| | Estimated Processing Cost (d) | $0 | $0 |
| | Market/Revenue | • Ontario<br>• Stable<br>• $50 per $m^3$ (about $200 per year) | • Ontario<br>• Stable<br>• $0.25 per litre (about $5,000 per year) |
| **Technical** | Collection Issues | • One time capital cost of $6,000<br>• Need to ensure only vegetable placed in container | • One time capital cost of $10,000<br>• Need to ensure only used oil placed in container |
| | Processing Issues | • No processing issues | • No processing issues |

**Notes**

(a) Based on average size of units.

(b) Estimated Greenhouse Gas (GHG) savings are the emissions avoided equivalent to the specified number of cars being removed from the road per year (i.e., the recycling of these materials has avoided the GHG emissions equivalent to the identified number of vehicles per year). GHG savings were estimated based on *EPA Warm Model*.

(c) Estimated energy savings equivalent to the amount of electricity not being used by the specified number of homes per year (i.e., the recycling of these materials has avoided the equivalent electricity consumption requirements of the identified number of homes per year). Energy savings were estimated using the *EPA Warm Model*.

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

**Table F-2: Overview of Key Environmental, Social & Financial Considerations and Technical Issues of Materials for the EnviroDepots that Need Further Investigation**

| Consideration | | Material Recommended for Further Investigation | |
|---|---|---|---|
| | | **Paint** | **Expanded Polystyrene (e.g., meat trays)** |
| **Environmental** | Estimated Annual Amount Diverted | 150,000 litres (new volume) | 40 tonnes |
| | Estimated Annual Units Diverted (a) | Not applicable | 4,500,000 |
| | Annual GHG Savings Equivalent to (b) | Not available | 40 tonnes<br>10 cars removed from the road |
| | Annual Energy Savings Equivalent to (c) | Not available | 1,700 GJ<br>50 homes supplied with electricity |
| **Social** | Public Support | • Strong<br>• Many residents already bring paint to depots in error | • Strong<br>• 5% to 10% of material already being placed in Blue Box |
| | Resident Issues | • EnviroDepots will provide convenience as some retailers that collected unwanted paint have recently stopped | • May result in increase street litter as materials are light and can blow away |
| **Financial** | Additional Collection Cost (d) | $20,000 | $20,000 |
| | Estimated Processing Cost (d) | $0 | $10,000 |
| | Market/Revenue | • Ontario, stable<br>• Paint collected & recycled at no cost as part of stewardship program | • Ontario, stable<br>• $400 to $900/tonne ($10,000 to $15,000/year) |
| **Technical** | Collection Issues | • Will require modifications to existing EnviroDepots; One time capital cost of $100,000 (approximate) | • None |
| | Processing Issues | • No processing issues<br>• Regional MRF capable of processing | • One time capital cost of $80,000 for densifer; will need to kept EPS separate from other recyclables |

**Notes**

(a) Based on average size of units.

(b) Estimated Greenhouse Gas (GHG) savings are the emissions avoided equivalent to the specified number of cars being removed from the road per year (i.e., the recycling of these materials has avoided the GHG emissions equivalent to the identified number of vehicles per year). GHG savings were estimated using the *EPA Warm Model*.

(c) Estimated energy savings equivalent to the amount of electricity not being used by the specified number of homes per year (i.e., the recycling of these materials has avoided the equivalent electricity consumption requirements of the identified number of homes per year). Energy savings were estimated using the *EPA Warm Model*.

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

Table F-2 continued on next page

**Table F-2: Overview of Key Environmental, Social & Financial Considerations and Technical Issues of Materials for the EnviroDepots that Need Further Investigation (continued)**

| Consideration | | Material Recommended for Further Investigation | |
|---|---|---|---|
| | | **Mattresses** | **Carpets** |
| **Environmental** | Estimated Annual Tonnes Diverted | 200 (if curbside ban implemented & 20% capture rate) | 200 (if curbside ban implemented & 10% capture rate) |
| | Estimated Annual Units Diverted (a) | 10,000 | 3,400 |
| | Annual GHG Savings Equivalent to (b) | Not available | Not available |
| | Annual Energy Savings Equivalent to (c) | Not available | Not available |
| **Social** | Public Support | • Low<br>• Most residents will use/ prefer existing free curbside collection | • Low<br>• Most residents will use/ prefer existing free curbside collection |
| | Resident Issues | • Will likely need to charge fee to cover cost of program (approximately $20 per mattress or box spring) | • Will likely need to charge fee to cover cost of program |
| **Financial** | Additional Collection Cost (d) | $5,000 | $5,000 |
| | Estimated Processing Cost (d) | $200,000 | $30,000 |
| | Market/Revenue | • Ontario<br>• Limited (1 recycler)<br>• $0 | • Ontario<br>• Limited (2 recyclers)<br>• $0 |
| **Technical** | Collection Issues | • May require modifications (& Capital costs) to existing EnviroDepots | • May require modifications (& Capital costs)to existing EnviroDepots |
| | Processing Issues | • Will need to transport to recycling facilities in Toronto | • Will need to transport to recycling facilities in Toronto |

**Notes**

(a) Based on average size of units.

(b) Estimated Greenhouse Gas (GHG) savings are the emissions avoided equivalent to the specified number of cars being removed from the road per year (i.e., the recycling of these materials has avoided the GHG emissions equivalent to the identified number of vehicles per year). GHG savings were estimated using the *EPA Warm Model.*

(c) Estimated energy savings equivalent to the amount of electricity not being used by the specified number of homes per year (i.e., the recycling of these materials has avoided the equivalent electricity consumption requirements of the identified number of homes per year). Energy savings were estimated using the *EPA Warm Model.*

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

**Table F-3: Overview of Key Environmental, Social & Financial Considerations and Technical Issues of Materials not Recommended to be Added to the EnviroDepot Program**

| Consideration | | Material not Recommended to be Added |
|---|---|---|
| | | **Film Plastic (e.g., grocery bags)** |
| **Environmental** | Estimated Annual Tonnes Diverted | 40 |
| | Estimated Annual Units Diverted (a) | 5,000,000 |
| | Annual GHG Savings Equivalent to (b) | 40 tonnes<br>10 cars removed from the road |
| | Annual Energy Savings Equivalent to (c) | 1,800 GJ<br>50 homes supplied with electricity |
| **Social** | Public Support | • Strong<br>• Many residents already place some film plastic in Blue Box |
| | Resident Issues | • Residents can already recycle plastic bags at many retail outlets<br>• Potential exists to enhance retail take back programs to include more locations and types of film plastic accepted |
| **Financial** | Additional Collection Cost (d) | $20,000 |
| | Estimated Processing Cost (d) | $5,000 |
| | Market/Revenue | • North American<br>• Stable<br>• Revenue significantly less than processing cost<br>• Revenue = 0 to $30/tonne ($0 to $1,200/yr) |
| **Technical** | Collection Issues | • None |
| | Processing Issues | • Regional MRF capable of processing<br>• May cause cross-contamination<br>• May increase equipment maintenance requirements |

**Notes**

(a) Based on average size of units.

(b) Estimated Greenhouse Gas (GHG) savings are the emissions avoided equivalent to the specified number of cars being removed from the road per year (i.e., the recycling of these materials has avoided the GHG emissions equivalent to the identified number of vehicles per year). GHG savings were estimated using the *EPA Warm Model*.

(c) Estimated energy savings equivalent to the amount of electricity not being used by the specified number of homes per year (i.e., the recycling of these materials has avoided the equivalent electricity consumption requirements of the identified number of homes per year). Energy savings were estimated using the *EPA Warm Model*.

(d) Estimates based industry estimates, literature review and data from other municipalities.

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