

# Final Report: CIF Project 558.3 - City of London – Supply & Distribution of Large Curbside Containers



**Table #1: Project Overview & Highlights**

Number of Blue Boxes delivered:	117,300 We added materials to our program at the same time: more plastics, aerosol cans, spiral wound cans
Dates delivered:	August 2011 to October 2011
Cost of Blue Box:	<ul style="list-style-type: none"> <li>• \$4.60 per box + \$0.52 per box for delivery + \$20,000 additional delivery costs<sup>1</sup> = \$5.12 per box</li> <li>• CIF grant = \$305,573 based on 50% of costs (including taxes)</li> </ul>
Impact on quantity of materials	<p>All materials:</p> <ul style="list-style-type: none"> <li>• Tonnes collected – decreased by 4%</li> <li>• Tonnes marketed – increased by 3%</li> <li>• Volume marketed – increased by 12%</li> </ul> <p>Paper stream:</p> <ul style="list-style-type: none"> <li>• Tonnes marketed – decreased by -1%</li> <li>• Volume marketed – increased by 2%</li> </ul> <p>Container stream:</p> <ul style="list-style-type: none"> <li>• Tonnes marketed – increased by 18%</li> <li>• Volume marketed – increased by 23%</li> </ul>

<sup>1</sup>. Miller Waste delivered the blue boxes and incurred additional costs because of a two week break in production, and reduced speed of production that resulted because of the need to change the resin composition.

## Background

The following details provide an overview on London’s program:

- 117,300 curbside households (plus approx 50,000 multi-res households)
- Two-stream program
- Curbside participation rate is approximately 90% and above 95% in some collection zones
- London provides blue boxes to newly constructed households. We deliver to new subdivisions and new streets as homes are built.

- Staff will be preparing a report to council to seek direction on how to provide blue boxes going forward. Some options to be considered: no change, provide at cost/free from depots, collectors to distribute as needed (at stops with broken, overflowing or no blue boxes).

## Program launch

A number of initiatives were launched in conjunction with the roll out of 'Big Blue' these included:

- Expanding our Blue Box program to include new materials. The new Blue Box provided additional capacity for the new container materials added (e.g., plastic clamshells, remaining plastic bottles #3, #6 and #7, aerosol cans, spiral wound cardboard cans)
- Discourage the use of plastic bags as containers for recyclables, because of the negative operational issues on managing film plastic at the MRF
- Emphasize the need for residents to sort recyclables into two streams. . .containers and paper products
- A drive to increase material going to the new MRF. In August 2011, London began processing Blue Box materials at a new City owned MRF (Manning Drive Regional MRF)

## Promotion

We worked with a consultant (Barb McConnell) to develop the campaign key message: *'Recycling makes a difference. Thank you!'* This was developed based on information from the consultant that residents want to know that their daily efforts of recycling result in a positive difference and they would like to be thanked for their efforts.



'Recycling makes a difference.

Thank you!' is hot-stamped on one side of the box, with images of the container stream materials accepted on the second side. A secondary campaign message was 'keep the two streams separated' This message was reinforced by the visual image of using two Blue Boxes in every visual element of any Blue Box P&E.

Promotion elements included:

- An insert into each Blue Box. This was inserted at the point of production
- News release
- Media spots (radio, TV, print)
- Print ads

London worked with the six MRF partner municipalities to assist with the launch of their CIF LCC projects in the spring of 2012. The municipalities took advantage of using the materials that London had developed and the resulting P&E development savings.

## Distribution of Blue Boxes



London released an RFP for the distribution of the Blue Boxes. Several bids were received ranging from less than \$1 to over \$7 per box delivered.

Miller Waste Systems, the contractor for London collection & processing operations, was the low bidder.

Blue Boxes were delivered to each home. The contractor was required to place the Blue Box at the front door.

## Results

Table 2 provides data on tonnes collected in the twelve-month period following the distribution of Blue Boxes (November 2011- October 12), compared to the previous twelve month period. Tables 3a & 3b provide information on the tonnes marketed in the twelve-month period following the distribution of Blue Boxes (2011-12). This is compared with data for prior years. The discussion in this report will focus on comparing the two periods 2011 to 2011-12, however a full five year period is provided to show trends, and to help us understand to what extent an observed change is the result of the Large Blue Box campaign, or part of a larger trend underway. Tables 4a & 4b provide information on the volume of materials marketed. Each of these will be discussed in detail below.

### Tonnes Collection: Discussion of Table 2

Table 2 provides information on the tonnes collected prior to and following the distribution of the large Blue Boxes. The data indicates that the amount collected decreased by 4% in the period following the distribution.

There are two factors, which may have as significant an impact on tonnes collected:

- The prolonged economic decline following the 2009 downturn: Noting the that total tonnes marketed (Table 3a) has not yet returned to the pre-2009 quantities of 2007 and 2008 we can assume that their continues to be a negative impact of the economy on Blue Box materials collected (i.e. generated).
- Changing composition of the Blue Box materials: in general we are seeing an increase of the lightweight & high volume materials (plastics & polycoats) and a decrease in the heavier, dense materials (glass, printed paper). This means trucks are collecting more volume and less weight.

The 4% decrease in tonnes collected was an unexpected result. By adding materials to our program (all plastics, aerosols, spiral wounds) and by delivering a new Blue Box to each curbside home we anticipated an increase in tonnes collected. It can be concluded that without these program enhancements the tonnes collected would have decreased by more than the 4%. To understand other factors of program effectiveness we we examined tonnes marketed and volume marketed (below).

Table 2: Tonnes Collected – Curbside Program

Periods before & after Blue Box Delivery <sup>1</sup>	November 2010 to October 2011	November 2011 to October 2012	Percent Change
Tonnes Collected	25,210	24,312	-4%

<sup>1</sup> Blue Boxes were delivered by November 2011

## Tonnes Marketed: Discussion of Tables 3a and 3b:

Table 3a (below) shows that the total tonnes marketed increased by 3% in the period following the Blue Box distribution compared to 2011 tonnes marketed. This increase compared to the decrease of tonnes collected is a result of the higher capture rate at the City of London's new Materials Recovery Facility (MRF) which opened in August 2011. As a new state-of-the-art, two-stream facility the London MRF has a very low residual rate which means we are capturing more of the Blue Box materials collected. We believe the new Blue Box contributed to this high capture. In addition to providing extra capacity to recycle more, the second Blue Box helped residents to do a better job of two-streaming their recyclables, which improves both the effectiveness and efficiency of the MRF operation.

Table 3a: Tonnes Marketed

Material	2007	2008	2009	2010	2011	2011-12	% Change
Printed Paper	14,367	14,420	13,546	10,958	12,960	14,850	15%
OCC/OBB	6,826	7,350	6,837	9,184	7,478	5,453	-27%
Poly Coat	0	0	295	215	176	242	38%
Aluminum	303	339	303	317	307	387	26%
Steel	1,006	1,032	1,005	973	995	1,025	3%
Flint	819	834	869	741	449	0	
Coloured Glass	2,205	1,785	1,348	1,381	1,662	2,445	16%
PET	965	1,047	1,000	974	994	1,301	31%
HDPE	507	594	559	533	519	484	-7%
Tubs and Lids	147	179	0	208	223	0	
Mixed Plastic	0	0	0	0	168	522	34%
Plastic Film/HDPE	0	0	0	0	70	183	162%
Polystyrene	0	0	0	0	0	0	
Comingled	24	10	2	0	0	0	
All materials	27,170	27,589	25,764	25,484	26,001	26,892	3%
Percent Change		2%	-7%	-1%	2%	3%	

As noted previously, the changing composition of the Blue Box means we are seeing an increase of the lightweight & high volume materials (plastics & polycoats) and a decrease in the heavier, dense materials (glass, fibre). In Table 3b (below), we have summarizing the materials groups to highlight this trend. There are some clear trends and impacts resulting from London's 2011 program enhancements:

- Minimal decrease (1%) in the paper stream (excludes polycoats as it is collected in London's container stream)
- Large increase (1,130 tonnes or 18%) in the container stream, the largest percentage increase being within the plastic recyclables. In addition to the impact of providing more curbside capacity to capture 'containers' other reasons for this increase include:

- Higher MRF capture rate of all materials, but especially container stream materials, due to new MRF (e.g., glass marketed increased by 300 tonnes)
- New program materials: aerosols, spiral wounds, PET clamshells, all plastics (excluding film & Styrofoam)
- Capture of film plastic received at the MRF. While not officially accepted within our program it is pulled off the line at the MRF and marketed, instead of sending it to residual

Table 3b: Tonnes Marketed – by material groups

Material	2007	2008	2009	2010	2011	2011-12
<b>All paper (excluding polycoat)</b>	21,193	21,769	20,383	20,142	20,439	20,302
<b>Percent Change</b>		<b>3%</b>	<b>-6%</b>	<b>-1%</b>	<b>1%</b>	<b>-1%</b>
<b>Poly, Metal, Glass</b>	4,333	3,990	3,820	3,627	3,588	4,100
<b>Percent Change</b>		<b>-8%</b>	<b>-4%</b>	<b>-5%</b>	<b>-1%</b>	<b>14%</b>
<b>All Plastics</b>	1,619	1,820	1,559	1,715	1,974	2,490
<b>Percent Change</b>		<b>12%</b>	<b>-14%</b>	<b>10%</b>	<b>15%</b>	<b>26%</b>
<b>All containers</b>	5,977	5,820	5,381	5,342	5,562	6,590
<b>Percent Change</b>		<b>-3%</b>	<b>-8%</b>	<b>-1%</b>	<b>4%</b>	<b>18%</b>

#### Volume Marketed: Discussion of Tables 4a and 4b:

To review the impact of the changing composition of the Blue Box from heavier, denser materials to lighter, higher volume materials Table 4a and 4b provide information about the estimated volume of materials marketed. The volume is estimated based on actual tonnes marketed and density factors (kilograms per cubic meter, kg/m<sup>3</sup>) for each material type. This is shown in Table 4a (below). With the exception of the economic downturn of 2009 there is a consistent trend of increasing volume of Blue Box materials marketed, with a significantly larger increase of 12% noted in the period following the distribution of large Blue Boxes. Some observations from Table 4a include:

- All container stream materials, except HDPE, have increased
- The biggest of these increases is in Polycoat (38%), Mixed Plastics (34%) and PET (31%).
- As noted above the capture of film plastic has increase significantly (160%). While not officially accepted within our program it is pulled off the line at the MRF and marketed, instead of sending it to residual. This increase is a function of MRF operations rather than any curbside change.

Only two materials are noted to show a decrease in volume. OCC/OBB and HDPE. The decrease in OCC/OBB can be explained by the increase in printed paper. Due to the improved operation of the new MRF, each paper grade is purer. Previously, the OCC/OBB and hardpack grades would have contained a higher portion of ONP. The reason for the decrease of HDPE is not known. It is speculated that there is a trend away from this material by manufacturers into some of the other plastic resin types. Waste audit data from the SO/CIF 2012-2013 waste audit will confirm this.

Table 4a: Volume Marketed – cubic meters (estimated using density factors)<sup>a</sup>

Material	kg/m <sup>3</sup> <sup>a</sup>	2007	2008	2009	2010	2011	2011-12 <sup>b</sup>	% Change
Printed Paper	250	57,500	57,700	54,200	43,800	51,800	59,400	15%
OCC/OBB	76 to 118a	57,800	62,300	57,900	77,800	77,200	71,900	-7%
Poly Coat	35	0	0	8,400	6,100	5,000	6,900	38%
Aluminum	30	10,100	11,300	10,100	10,600	10,200	12,900	26%
Steel	90	11,200	11,500	11,200	10,800	11,100	11,400	3%
Flint	300	2,700	2,800	2,900	2,500	1,500	0	
Coloured Glass	300	7,400	6,000	4,500	4,600	5,500	8,200	17%
PET	25	38,600	41,900	40,000	39,000	39,800	52,000	31%
HDPE	25	20,300	23,800	22,400	21,300	20,800	19,400	-7%
Tubs and Lids	25	5,900	7,200	0	8,300	8,900	0	
Mixed Plastic	25	0	0	0	0	6,700	20,900	34%
Plastic Film	28	0	0	0	0	2,500	6,500	160%
Polystyrene	15	0	0	0	0	0	0	
All materials		211,500	224,500	211,600	224,800	241,000	269,500	12%
Percent Change			6%	-6%	6%	7%	12%	
OCC/OBB density kg/m <sup>3</sup> <sup>c</sup>		118	118	118	118	97	76	

Notes

- Volume is estimated using based on tonnes marketed, and the density for each material type as listed. Density for OCC/OBB changed due to improved processing at new MRF
- 2011-12 is a twelve-month period following the distribution of the Blue Boxes, from November 2011 to October 2012. It is compared to 2011 data. Data from 2007 to 2010 is also included to provide further comparator data and information about trends that may be occurring
- The density of OCC/OBB was estimated be 118 kg/m<sup>3</sup> prior 2011, 97 kg/m<sup>3</sup> for 2011 and 76 kg/m<sup>3</sup> after 2011. The change in density is because of the change in processing facility in 2011. The composition of hardpack shipped from the two facilities was different.

Table 4b (below) confirms the trend observed in Table 3b with respect to the changing composition of Blue Box materials towards lighter-weight, high-volume materials:

- the volume of the paper stream increased by 2%
- the volume of the container stream increased by 23% and within this plastics had the highest increase of 26%

This data validates the direction of CIF and London to provide a large volume Blue Box to capture more of these high volume materials.

Table 4b: Volume of materials marketed – Summary Groupings

<b>Material</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2011-12</b>
<b>All Paper</b>	115,300	120,000	112,100	121,600	129,000	131,300
<b>Percent Change</b>		<b>4%</b>	<b>-7%</b>	<b>8%</b>	<b>6%</b>	<b>2%</b>
<b>Poly, Metal, Glass</b>	31,400	31,600	37,100	34,600	33,300	39,400
<b>Percent Change</b>		<b>1%</b>	<b>17%</b>	<b>-7%</b>	<b>-4%</b>	<b>18%</b>
<b>All Plastics</b>	64,800	72,900	62,400	68,600	78,700	98,800
<b>Percent Change</b>		<b>13%</b>	<b>-14%</b>	<b>10%</b>	<b>15%</b>	<b>26%</b>
<b>All Containers</b>	96,200	104,500	99,500	103,200	112,000	138,200
<b>Percent Change</b>		<b>9%</b>	<b>-5%</b>	<b>4%</b>	<b>9%</b>	<b>23%</b>

- There has been an improvement in the quality of materials arriving at MRF
- More Londoners are using better two stream separation at the curb which assists the collection and recycling process
- There has been a noticeable reduction in the use of plastic bags to contain recyclables which improve the efficiency of MRF operations

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