



Brockville All Bottles Plus Campaign

Summary and Report of Waste Audits

1. Introduction

1.1 Background

Stewardship Ontario in conjunction with the City of Brockville is developing, testing and measuring the impact of an all bottles plus communications campaign.

1.2 Terminology

The all bottles campaign included posters, radio ads and TV commercials that targeted the following materials:

- **PET Bottles:** Include #1 clear and coloured bottles, #1 food and non-beverage bottles and jars – namely cooking oil, peanut butter, dish soap, etc.
- **HDPE Bottles:** Include #2 beverage bottles and jugs, juice, milk, etc., and #2 laundry detergent, shampoo, windshield washer fluid, etc.
- **Other Bottles:** Include #3 PVC bottles and jars – in particular lotions, soaps, bug repellents, shampoos, etc. Also included are #4 LDPE, #5 Polypropylene and #7 mixed resins which include mustard, ketchup and select juices.
- **Wide Mouth Tubs and Lids:** Include #2 HDPE, #4 LDPE and #5 Polypropylene pails, lawn, garden, kitty litter, paint containers, etc.

2. Scope of Work

2.1 Purpose and Objectives

The main objective is to collect accurate single-family waste composition and generation data before and after the advertising campaign, and to determine the impact of the campaign on recycling recovery rates of plastics bottles and tubs and overall container recycling in general.

2.2 Methodology

The sample material came from 100 randomly selected single-family homes (10 homes in a row in 10 sample areas) that together represent the municipality's single-family waste generation/recovery behaviour.

The sample consists of 2 separate independent and identical audits of 4 weeks in order to capture the fibre and container streams from Brockville's recycling program.

The baseline and tracking audits consisted of 4 weeks of data calculated in kilograms per household per week at the same addresses to encourage consistency within the dataset.

Although all efforts were put forward to collect samples from all 100 households, only 90 single-family homes had verifiable data, as one street in particular had not set out any containers for pick-up.

2.3 Reporting and Audit Results

The waste audit results are summarized into 2 worksheets consisting of collection results and sort results.

- *Sort Results:* Hold the weights (in kg/hhld/week) of each street and the summary of overall generation per street. The data consists of garbage, recycling and total waste (the sum of garbage and recycling) for calculating capture rates.
- *Collection Results:* Hold the results attributed to number of set outs, blue box equivalents and average set out per week per street. This will confirm that residents are setting out waste/recycling boxes.

3. Highlights

3.1 Sort Results

Although capture rates for the materials of interest are already high, the following points are highlighted:

- PET bottles increased by 0.93 kg/hhld/week approximately 25%,
 - resulting in a 10% increase in capture rate.
- HDPE bottles decreased by 3% with respect to generation, while capture rate increased by 1% over the study.
- Other bottles, which are not targeted by Brockville's program, decreased by 0.07 kg/hhld/week approximately 12%,
 - resulting in a 2% decrease in capture rate.
- Tubs and lids increased by an average of 0.06 kg/hhld/week – a 6% increase,
 - resulting in an 8% increase in capture rate.
- Corrugated paper packaging increased by an average of 0.19 kg/hhld/week – a 78% increase.
- Aluminum food and beverage cans increased in recovery by 55%,
 - resulting in a 13% increase in capture rate.
- Total glass, which includes all clear and coloured glass increased by 21% in recovery,
 - resulting in a 5% increase in capture rate.
- With 90% certainty, the tracking data shows a statistical difference from the baseline data.

3.2 Collection Results

- The total number of Blue Box set-outs increased by 20% for fibres and 2% for containers.
- The average number of full Blue Boxes per household increased 36% for fibres and 13% for containers.
- An average of 58% of households on a given street set out Blue Boxes during the baseline month, which increased to 61% after the tracking month.

4. Detailed Results

4.1 Targeted Materials

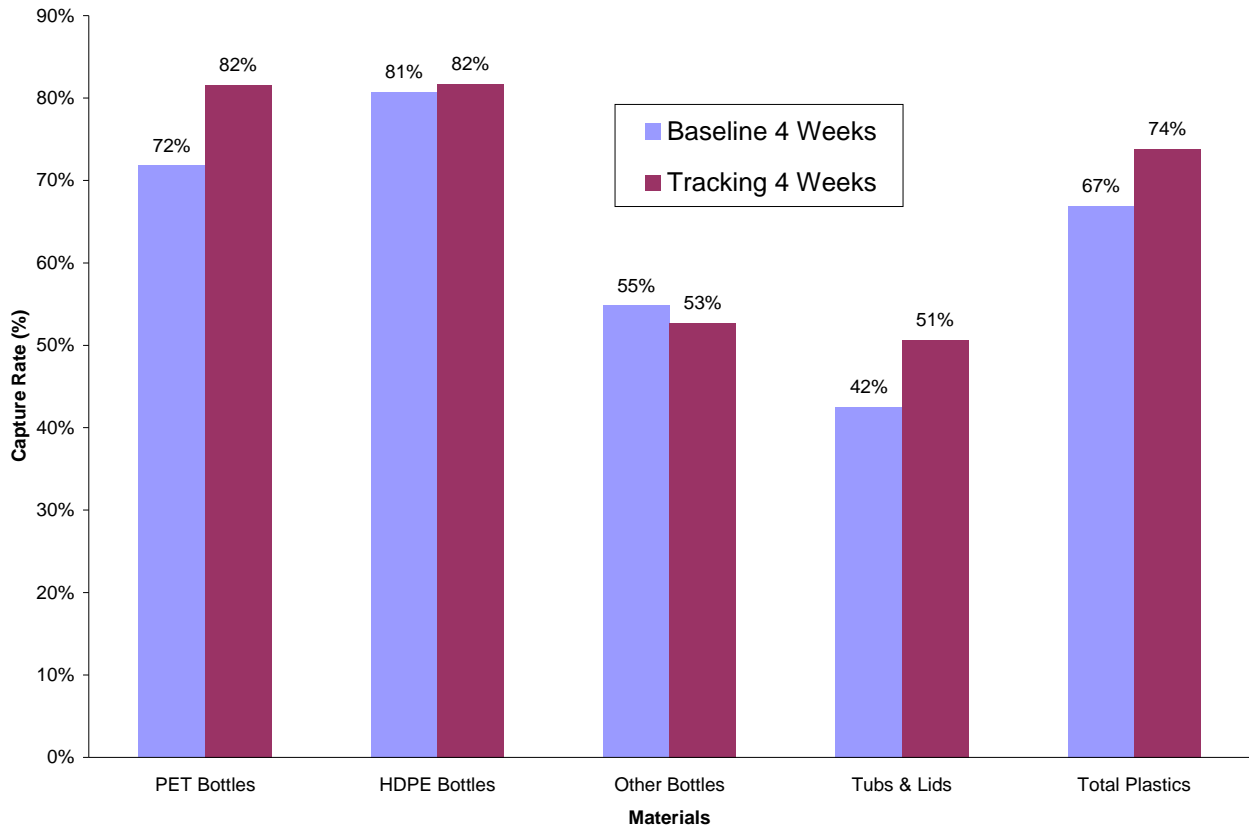
The materials of particular interest are PET bottles, HDPE bottles, other bottles and wide mouth tubs and lids. As PET bottles, HDPE bottles and wide mouth tubs and lids increased with respect to capture rate, total other bottles decreased. Although the decrease in capture rate of other bottles may seem like a negative, the overall percentage of other bottles in total plastics recovered was 5%, and the data showed no particular trend towards a decrease. Table 4.1.1 summarizes these findings from pre-campaign to post campaign including the changes to capture rates for the materials of interest.

Table 4.1.1: Summary of generation, recovery and capture rate of the materials of interest

	Garbage			Recycling			All Waste			Capture Rates (%)		
	Baseline	Tracking	% Change	Baseline	Tracking	% Change	Baseline	Tracking	% Change	Baseline	Tracking	Absolute Change
	(kg/hhld/year)	(kg/hhld/year)		(kg/hhld/year)	(kg/hhld/year)		(kg/hhld/year)	(kg/hhld/year)		4 Weeks	4 Weeks	
PET Bottles	1.44	1.04	-28%	3.67	4.60	25%	5.11	5.64	10%	72%	82%	10%
HDPE Bottles	0.67	0.61	-9%	2.81	2.74	-3%	3.48	3.35	-4%	81%	82%	1%
Other Bottles	0.45	0.43	-4%	0.55	0.48	-12%	1.00	0.92	-9%	55%	53%	-2%
Tubs & Lids	1.44	1.10	-24%	1.06	1.13	6%	2.51	2.22	-11%	42%	51%	8%
Total Plastics	4.01	3.18	-21%	8.10	8.95	11%	12.11	12.13	0.22%	67%	74%	7%

Figure 4.1.1 below shows the increase in capture rates from pre-campaign to post campaign of the materials of interest. The final two bars show the increase in total plastics capture rate. At a 90% confidence level, the tracking data shows a statistically significant difference in capture rates compared to that of the baseline data. Also, since the data was collected during the same weather season, there are no discrepancies in mean generation estimates that could be affected by waterlog.

Figure 4.1.1: Capture rates before and after campaign of targeted materials



4.2 Other Recoverable Materials

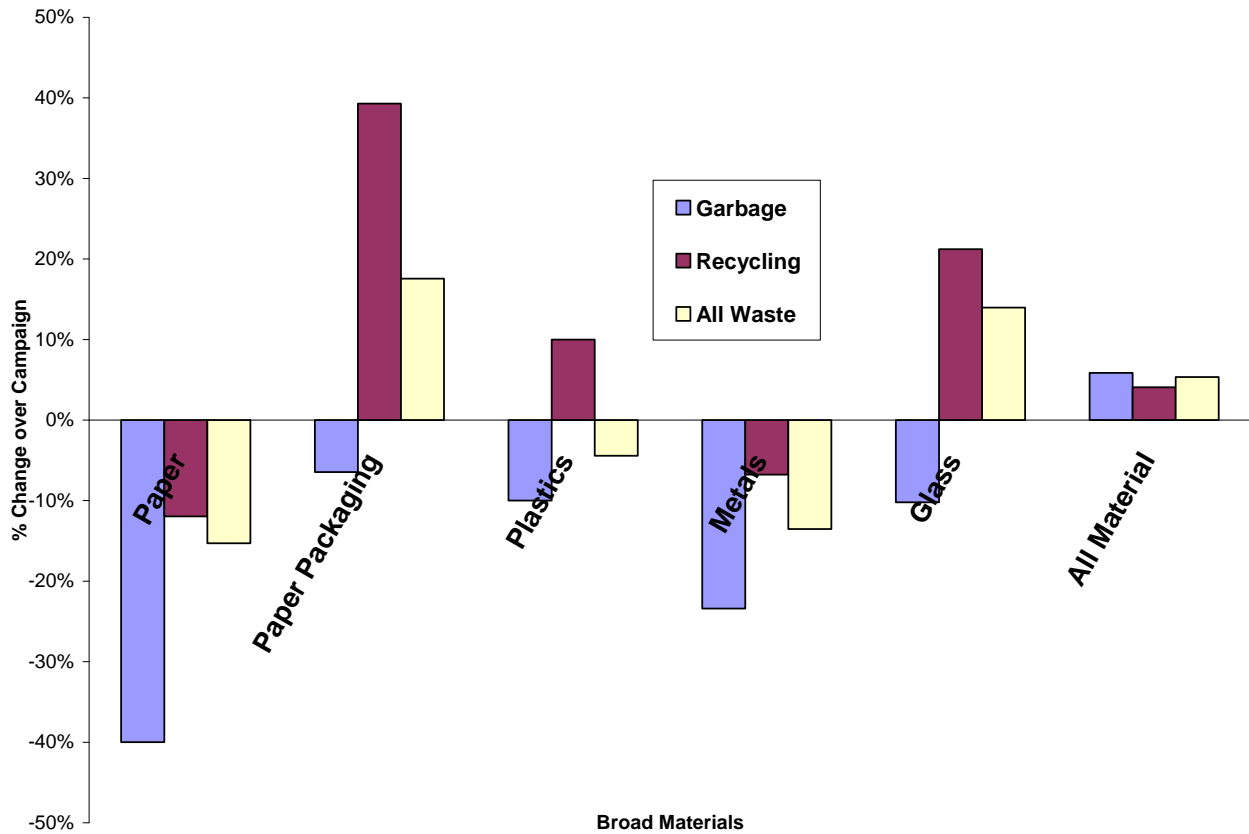
The all-bottles campaign primarily targeted four plastics categories, PET bottles, HDPE bottles, other bottles and tubs & lids. This section describes the other materials collected in a broader scope. The capture rate of broad material categories was calculated and summarized in Table 4.2.1. Total paper increased in recovery by 3.5%, of which books and other paper were the large increases. Paper-packaging increased by approximately 10% largely due to increases in recovery of polycoat and aseptic containers. Total metals and total glass increased by 5%, mainly attributed to increases in aluminum food and beverage cans and other coloured glass. It should be noted that Table 4.2.1 is a consolidated list of all materials measured in the audit.

Table 4.2.1: Consolidated Capture rates of selected materials pre and post campaign

Specific Material	Pre Campaign Capture Rate	Post Campaign Capture Rate	Absolute Change
PAPER			
Newspaper – Dailys and Weeklys	98.4%	98.4%	0.0%
Newspaper - Other	97.5%	98.4%	1.0%
Magazines & Catalogues	96.0%	97.2%	1.2%
Books	22.7%	61.4%	38.7%
Other Paper	45.5%	61.1%	15.6%
Total Paper	88.0%	91.5%	3.5%
PAPER PACKAGING			
Corrugated Total	92.9%	90.7%	-2.2%
Boxboard / Cores	73.8%	76.2%	2.4%
Polycoat Total	48.9%	100.0%	51.1%
Aseptic Containers Total	2.1%	28.7%	26.6%
Total Paper Packaging	52.5%	62.2%	9.7%
PLASTICS			
PET Beverage Bottles Total	73.4%	84.9%	11.5%
PET Other Bottles & Jars	68.7%	74.3%	5.6%
PET Other Packaging	53.1%	62.3%	9.2%
HDPE Beverage Bottles	91.1%	88.2%	-2.9%
HDPE Other Bottles & Jugs	78.5%	80.2%	1.7%
PVC Bottles & Jars	47.1%	79.7%	32.5%
Other Bottles, Jars & Jugs	56.6%	44.5%	-12.1%
Other Plastic Containers Total	56.6%	44.0%	-12.6%
Polystyrene Packaging	21.2%	24.3%	3.1%
Wide Mouth Tubs & Lids	42.5%	50.6%	8.1%
Large HDPE & PP Pails & Lids	87.6%	92.8%	5.2%
Total Plastics	27.8%	32.0%	4.2%
METALS			
Aluminum Food & Beverage Cans Total	70.5%	83.8%	13.3%
Aluminum Foil & Foil Trays	16.4%	18.6%	2.1%
Steel Food & Beverage Cans Total	85.5%	87.4%	1.9%
Total Metals	59.5%	64.1%	4.6%
GLASS			
Clear Glass Alcohol Beverage Total	87.9%	77.0%	-10.9%
Coloured Glass Alcohol Beverage Total	84.7%	78.3%	-6.4%
Clear Glass Other Beverage and Food	84.9%	88.1%	3.2%
Coloured Glass Other Beverage and Food	89.6%	100.0%	10.4%
Total Glass	76.9%	81.8%	4.9%
Grand Total	64.3%	68.4%	4.1%

Figure 4.2.1 shows the percentage change in kilograms per household per week of all broad material categories. For recyclable materials, the general trend shows that garbage generation decreased while recycling averages increased. The large increase in paper packaging was largely attributed to an increase in recovered aseptic containers found on certain streets.

Figure 4.2.1: Percent change over campaign for mean generation of broad categories



4.3 Contaminants

The pre-campaign total contamination levels grew by 16% over the 8 week period. The contaminants included laminated paper packaging, gable top cartons, aseptic containers, PET other packaging, polyethylene plastic bags and film, durable plastics and other rigid plastic packaging. Table 4.3.1 below summarizes these results.

Table 4.3.1: Contamination composition in Blue Box of all materials

	Pre-Campaign (kg/hhld/week)	Post Campaign (kg/hhld/week)	Growth (%)
Total Contamination	0.1204	0.1402	16.5%
% of Total Recovered	4.3%	4.8%	11.9%

If we restrict the tonnages to just look for plastic contaminants – namely the plastic packaging including blister packs, and the plastic bags and film, the contamination decreases from baseline data to tracking data, while the contamination in tonnages stayed relatively constant.

Table 4.3.1: Contamination composition in Blue Box of all materials

	Pre-Campaign (kg/hhld/week)	Post Campaign (kg/hhld/week)	Growth (%)
Plastic Contamination	0.0869	0.0938	7.9%
% of Total Recovered Plastic	35.0%	34.3%	-1.9%

5. Conclusions

Of the materials targeted – PET bottles, HDPE bottles, wide mouth tubs and lids, and other bottles, the overall capture rate over the campaign increased by 7%. Although recovery rates for these materials were already high, they did grow in tonnages as well. PET bottles increased by 25% over the campaign while tubs and lids increased by 6%. Other bottles not collected by Brockville decreased in capture rate – even though the campaign encouraged recycling of all bottles.

The collection results show the average number of set outs on a given street increased by 3% to 61%, while the average number of full blue boxes per house increased by 13% on the container set out and 36% on the fibre set out.

Other materials did relatively well throughout the campaign. Notable increases were polycoat containers and aseptic containers which contributed to a 10% increase in total paper packaging.

All material contamination rates in the Blue Box grew by approximately 17% throughout the campaign, although the percent of contamination is considered relatively small at around 5%. When plastics are only considered, the contaminants grew by roughly 8%, however the percent of plastic contaminants decreased over the campaign.