

Final Report

CIF 174

Multi-residential Recycling: Implementing Best Practices *City of Peterborough*



City of
Peterborough

Final Project Report, October 2010
City of Peterborough
CIF 174

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Funded in part by



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October 2010

Note to reader: Project 174 was underway before the development of the [CIF Best Practices Guidelines for Multi-residential](#) and the final report was written well before the [CIF Final Report Template for Multi-res](#) practices was developed. While many procedures of CIF 174 are similar to the Best Practice Guideline and report sections have been borrowed from the Template Report, overall this report does not follow the procedure and formatting set in the CIF Guidelines and the Report Template.

1. Executive Summary

This is the final report of a project implemented by City of Peterborough between May and December 2009. The project goal was to increase recycling rates by implementing best practices in the municipal multi-residential recycling program. The project work was completed by Peterborough staff. Waste Diversion Ontario - Continuous Improvement Fund (WDO - CIF) provided financial and technical assistance.

In 2009 the City of Peterborough provided blue box recycling to approximately 34,000 households, of which approximately 20% were in multi-residential buildings. The number of multi-residential buildings provided with municipal recycling service was approximately 150. The best practices that were implemented during this project included:

- creating a database of multi-residential properties
- evaluating the recycling performance of individual buildings
- estimating the overall program recycling rate
- increasing the number of recycling containers at buildings
- development and distributing new promotion and education materials to residential and building staff

Additional work included in this project included: outreach activities at some buildings and distribution of in-unit recycling bags to all buildings.

The average baseline-recycling rate at buildings was estimated at 115 kg per unit and the total amount recycled for all buildings was estimated at 725 tonnes per year. After a promotion and education campaign, the provision of recycling bags and more recycling totes, it is estimated the recycling rate increased to 125 kg per unit, representing an increase in the range of 5 to 8%.

The project budget was \$47,000. The Continuous Improvement Fund contribution to the city of Peterborough was \$13,250. Additional funding (not included in this project budget) valued at approximately \$7,500 was contributed by CIF for the development of generic multi-residential promotion and education materials, which were used by Peterborough.

2. Introduction

The City of Peterborough undertook, through the Continuous Improvement Fund, Application #174, a project entitled “Multi-Residential Benchmarking, Database Development and Communications”.

The City of Peterborough provides blue box collection to 33,700 households. Approximately, nineteen percent (19%), or 6,400 are multi-residential households that require depot-style recycling systems. The City of Peterborough provides 95-gallon capacity rollout carts to these buildings and estimates that close to 100% of all buildings participate in the City’s recycling program.

In 2008, the City of Peterborough changed to a two-stream recycling program. Due to limited staff resources, there was very little promotion and education (P&E) done at that time which was specific to the multi-residential sector. This project provided an opportunity to visit all buildings, update our database and provide new P&E about the two-stream program and multi-residential recycling in general. Recycling bags were distributed to all residents and out-reach activities were conducted at some buildings.

3. Background: multi-residential recycling program overview

This section will provide a descriptive overview of the Peterborough’s multi-residential program. The program can be described as follows:

- Multi-residential recycling is provided at buildings with eight (8) or more units
- Approximately 20% of all households are in multi-residential buildings
- Recycling program details:
 - Collection is weekly and is based on a two-stream recycle sort (since 2008)
 - Residents place their recyclables in 360 litre (95 gallon) carts (totes)

- Carts have been traditionally provided at no charge by the City of Peterborough. Beginning in 2009 the City has begun to charge property owners for carts. The cost to purchase the carts is \$75.00 including tax and they are replaced free of charge if they are damaged or broken.
- Recyclables are collected on a four-day schedule and on the same route as curbside households. As a result there is no tonnage data specific to this program, or other key performance indication data (i.e., cost per tonne, kg per unit).
- Buildings may set garbage out to the curb in bags for curbside collection. They are required to comply with the City's 2-bag-limit per apartment unit.
- Peterborough does not provide front-end bulk bin garbage collection to multi-residential buildings

The following tables provide summary information on the number of households and percent that receive blue box service:

Table 3.1: Number of households in municipality (2008)

	Households	Percent
Curbside	27,300	81%
Multi-res	6,400	19%
Total	33,700	100%

Table 3.2: Number of households with municipal blue box program (2008)

	Curbside	Multi-Res	Total
All households	27,300	6,400	33,700
Households with municipal blue box program	27,300	6,400	33,700
% with blue box program	100%	100%	100%

Over the period of the project the number of multi-residential units decreased as buildings that did not meet the requirements of the definition of a residential unit were found. This is illustrated in Table 3.3 below. The decrease was 7 buildings and 613 units. The reason for this decrease is that the units are not residential units (do not have a kitchen) and do not have their own recycling, therefore, these buildings were removed. These buildings were removed because the staff look after the recycling and the residents have very little to nothing to recycle in their rooms. If they have recycling, they take it to the staff to add to the building recycling.

Table 3.3: Multi-residential units before and after project (May – Dec 2009)

	Before project	After project	% change
Buildings with recycling	150	143	-5%
Units with recycling	6,830	6,217	-9%
Unit/building	46	43	-5%

Note: See Appendix 1, for details of how buildings were counted in Phase 1 and Phase 3 site visits.

4. The project scope

The project scope included three main phases:

Phase 1: Benchmarking, Database Development and Baseline Site Visits

Phase 2: Deliver In-unit Bags, Carts, P&E Materials

Phase 3: Out-Reach Activities Completed, Site visits to collect post-implementation data

Table 4.1 provides an overview of the work completed by each Phase. Each of the phases is discussed in the following sections, Section 4.1, 4.2 and 4.3.

Table 4.1: Project Work, Phases 1 to 3

Project Work	Phase 1 June 2009	Phase 2 Sept – Oct	Phase 3 Oct – Dec
Visit all buildings to complete a program inventory to include: <ul style="list-style-type: none"> • Performance indicators (how full are the carts) • Areas for improvement • Number of buildings and units • Building contact information • Number of carts • Data input 	✓		✓
New Promotion and education to focus on two-stream recycling, to include: <ul style="list-style-type: none"> • Producing and re-labelling carts with new stickers • Producing and posting posters for all buildings 	✓	✓	✓
Purchase and distribution of in-unit recycling bags to all units		✓	
Purchase and distribution of 100 new carts to buildings that need more capacity for recycling	✓	✓	
Speaking to residents, where appropriate, will include: <ul style="list-style-type: none"> • Lobby displays • Door-to-door out-reach 		✓	✓
Monitor project success and submit final report detailing timelines			✓

4.1 Phase 1: Database Development & Baseline Site Visits

Creating and maintaining a database of all multi-residential properties is an important step towards implementing best practices. In-person site visits to each building were completed to collect detailed information such as how well the recycling program was working, building characteristics that may

create recycling challenges or opportunities (e.g., room for recycling bins), contact information for the on-site representative (e.g. superintendent) and the role that the on-site staff play in managing the building's recycling program. Data was collected by Peterborough City staff. To increase consistency of data collection two staff were dedicated to completing the site visits.

Phase 1 tasks included the following:

- Property owners and superintendents were contacted by telephone or in person and all contact and building information was updated.
- Site visits were completed on 150 buildings, representing 6,830 residential units.
- Data was collected to record recycling program information, performance monitoring (i.e. estimate of how much was being recycled) and barrier identification at all buildings. Other information regarding building demographics, use of any promotional and educational material and labelling was noted at this time.
- Carts were cleaned with a cleaning solution before affixing the label(s).
- Labels were placed on carts when required (worn out or outdated).
- Educational posters were posted in common areas of buildings (laundry rooms, lobbies).

A copy of the site visit form is attached as Appendix 1.

4.1.1 Database and completeness of data

Data was input on an excel database. The project was successful in updating data on 100% of all buildings.

Table 4.2 provides summary information on data completeness.

Table 4.2: Database summary

Buildings	Total in municipality¹	Recycling provided by municipality	Site visits completed²	Data updated²
Number of buildings	150	150	150	150
% of all buildings	100%	100%	100%	100%

Notes

¹ Total number of buildings of eight or more residential units.

² Site visits and data updates were completed at all buildings where access was permitted.

A database was created for the multi-residential buildings in Peterborough. This database includes:

- building address
- building name
- building units
- number of floors
- superintendent / owner name; contact information
- collection day
- number of caddies; paper and container
- caddy serial numbers
- demographics of building
- recycling depots; indoor or outdoor
- label information
- poster information
- measure of cart fullness
- barrier identification

- contamination or stream mixing issues
- site visit dates

4.1.2 Data maintenance

After the initial investment to create an up-to-date database it is important to protect this investment by maintaining the database and ensuring a process of keeping it up-to-date.

The Waste Management Collection Coordinator updates the database as required. Whenever a Multi-Residential Building orders a caddy (360 litre roll-out cart) or needs a replacement caddy, all information is confirmed at this time. The serial numbers of the new caddie(s) are captured and information collected. New labels are given at this time as well as asking if they may need more labels due to old labels being worn. Also inquire if they might need more posters for their building.

4.1.3 Baseline Site Visits - Benchmarking performance

A key step in implementing program improvements is to benchmark current performance to provide a baseline against which to measure future recycling rates.

Evaluating performance is a quantitative assessment that measures the following:

- 1) How much each building is recycling (kg/unit), and
- 2) How much is being recycled by all the buildings collectively.

As the actual weight of recyclables collected from multi-residential buildings was not available, container fullness and contamination were monitored during site visits and used to indicate buildings performance. As a result performance data completed during site visits is an estimate only as it is not based on precise weights. However when done consistently it has been shown that estimated data is found to be within 10-15% accuracy of actual weights. Obtaining this information from each building was instructive both for flagging low performing buildings and for highlighting top performers. Low performers were flagged for follow-up strategies and top performers provided useful model buildings.

Table 4.3: Phase 1 Site Visit Results - Carts Fullness

		Paper Stream			Container Stream		
Collection Day	Units	Total Carts	Full Carts	% Full	Carts	Full Carts	% Full
Tuesday	2,664	197	176	89%	140	112	80%
Wednesday	1,731	144	120	83%	117	76	65%
Thursday	654	71	63	89%	58	45	78%
Friday	1,214	109	92	84%	74	63	85%
Total	6,263	521	451	87%	389	296	76%

(excluding Retirement Home Information (597 units & 6 buildings))

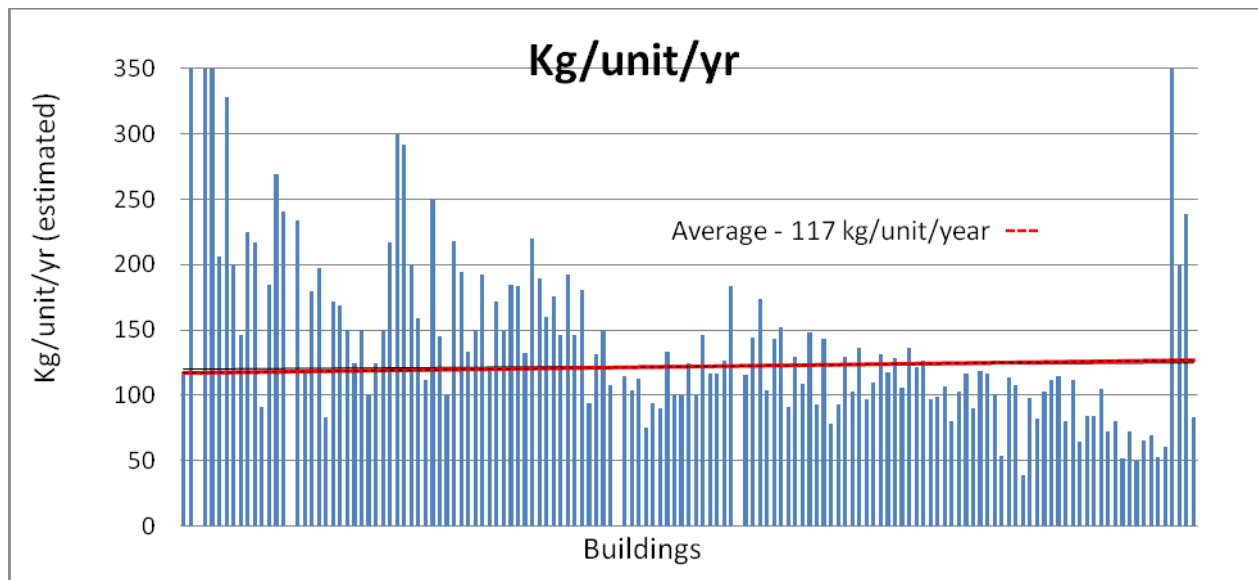
Table 4.4: Phase 1 Site Visit Results – Estimated Blue Box Recovery

Units	Estimated Tonnes	Kg/unit/year
6,263	747	119

4.1.4 Recycling rate estimates

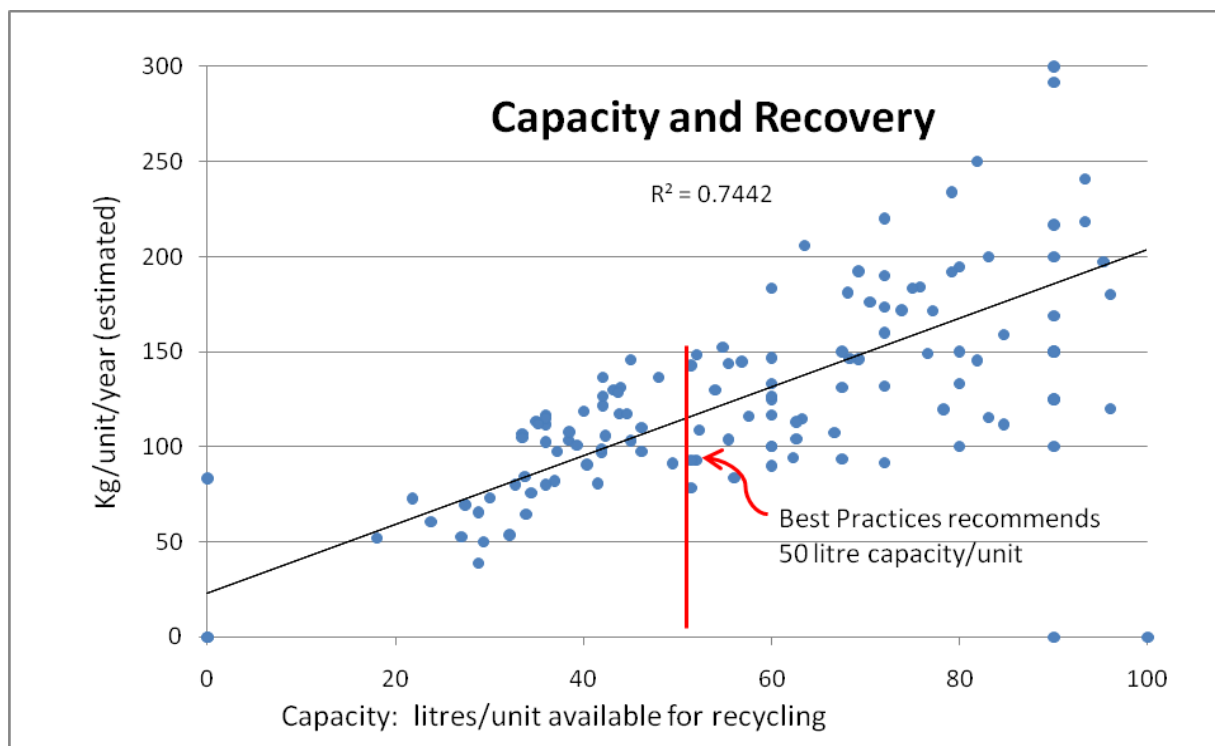
The Graph below illustrates the distribution of estimated recycling rates at the 150 buildings.

Graph 4.5: Estimated building recycling rates, baseline data, 2009



Graph 4.5 shows the distribution of recycling rates (estimated kg/unit/year) based on estimates completed at visual site inspections at 150 buildings. The average recycling rate for all buildings is 117 kg per unit per year. Estimates are based on visual inspections and represent a 'snap-shot' of the multi-res program. In the absence of weight based data from collection trucks this data provides a baseline of the program performance.

Graph 4.6: Relationship between recycling capacity and recovery



Graph 4.6 shows the relationship between the cart ratio and the estimated recovery. The Graph 4.6 illustrates that when buildings are provided with more recycling containers they will fill them and recycle more. Best Practices recommend that municipalities should provide a minimum of 50 litres per unit of capacity – 50 litres is the size of a standard 14 gallon curbside blue box. This is equivalent to one 95 gallon cart for every seven (7) residential units.

The R Squared (coefficient of determination) in this relationship is 0.74, indicating that there is a statistical relationship between the two variables of recovery of capacity, such that in approximately 75% of the buildings, the quantity recovered is dependent on the litres per unit available for recycling. As indicated in the graph, many of Peterborough's buildings have capacity above the recommended best practices level and are also recycling above the overall average.

4.1.5 Barriers to Recycling

This section reviews the barriers to recycling that were noted during the initial site visits. Summary information is presented in Table 4.7.

The objective of assessing recycling barriers is to identify those buildings that require further attention and to reduce those barriers that may limit how much the building recycles. The exercise also identified buildings that had implemented 'better' and 'best practices' in the barrier categories and were examples of 'how to' remove the barriers to recycling. It was expected that most buildings would fall between these two extremes. Buildings were ranked in categories of 'barriers' on a scale of 1 to 3. A score of '1' was a low score and was interpreted as an 'action item' for municipal staff and a high score of '3' was reserved for buildings that had taken actions to remove the barrier and had implemented 'best practices' in the category. A rating of '2' indicated the building was doing 'OK' and required no further action at that time.

During site visits, staff reviewed the following barriers:

1. OCC (Old Corrugated Cardboard) - how well is the OCC is managed
2. Contamination – level of non-recyclables in carts
3. Stream Mixing – how well are materials separated into two streams
4. Accessibility – how accessible is the recycling area to building residents
5. Loose Materials – are there loose recyclables or garbage in the recycling area
6. Overflowing Carts – indicates that there are not enough carts
7. Area Clean – how clean and tidy is the recycling area
8. Area Well Lit – how well lit is the recycling area
9. Labels and signage – condition & accuracy of labels on recycling containers & signage in recycling area

Table 4.7: Barriers to recycling noted at site visits completed at approximately 150 buildings

Recorded Recycling Barrier	Number of buildings that require corrective action (score of 1 on barrier evaluation)	Require corrective action as a % of all buildings	Number of buildings that set high standard 'model building' (score of 3 on barrier evaluation)	Model buildings as a % of total
OCC	23	16%	45	31%
Contamination	17	12%	25	17%
Stream mixing	10	7%	8	6%
Accessibility	13	9%	92	64%
Area tidiness	20	14%	89	62%
Overflow	4	3%	42	29%
Cleanliness	47	33%	38	26%
Lighting	0	0%	0	0%
Labels & signage	35	24%	22	15%
	169 = total number of recorded 'problems'		361 = total number of recorded 'good examples'	

A simple three-point (1, 2 or 3) ranking system was used to rate each building's recycling depot and flag problems that require attention. A score of '1' on any of the program attributes signifies an issue in need of attention. By counting the number of scores of 1 each building received during the evaluation, the buildings can be separated into different categories to see how well they performed and to prioritize outreach activities. Given limited resources, including municipal staff resources, this exercise of prioritizing buildings allowed staff to focus on those buildings in greater need of attention. Table 4.8 has grouped buildings based on their priority of 'in need of assistance from the municipality.'

- If the building has 2 or more scores of 1, then they are considered a high priority for follow-up outreach activities,
- If they have 1 score of '1' then they are of medium priority, or
- If the building has no scores of '1' then it is considered a low priority.

Table 4.8: Priority levels of buildings based on barriers, before & after

	High Priority: Buildings with 2 or more scores of '1'	Medium Priority: Buildings with 1 score of '1'	Low Priority: Buildings with no scores of '1'
Phase 1: Baseline site visits			
Number of buildings	50	41	52
Percent of all buildings	35%	29%	36%
Phase 3: Post-implementation site visits			
Number of buildings	22	23	94
Percent of all buildings	16%	17%	67%
% change Phase 1 vs Phase 3	-54%	-41%	86%

Note: a score of '1' indicates a recycling barrier in need of attention by municipal staff.

Table 4.9 below shows the buildings with 3 or more scores of 1. These are the highest priority buildings in Peterborough. It is interesting to note, that all but one of the above high priority buildings have outdoor depots. At a number of these buildings carts were labelled in Phase 1, Phase 2 and Phase 3 of the project. Labels were repeatedly removed from the carts at these buildings. All of the buildings in the above chart work with the Housing Division in the City of Peterborough. It may be possible to work with the Housing Division regarding the above results of the project to try and bring the recycling up to par with the rest of the City of Peterborough.

Table 4.9 Barrier identification of the highest priority buildings

High Priority: Buildings with 3 or more scores of '1'	Social Housing Providers		Affordable Housing
	Peterborough Housing	Other SHP	TVM
	3	2	3

As part of the barrier identification process, the specific findings with regards to contamination were found:

- An average of both phases found that Peterborough had less contamination in the paper products caddies than in the container products. Paper products averaged an 85% fill rate while the containers average was lower at 77%.
- While performing the audits; it was clear that further education is necessary regarding the container stream. This may be due to the fact that a larger variety of items are allowed into the container stream. The lids from coffee cups, hangers (both plastic and metal), and plastic utensils were common items in the container bin. Gable top containers were frequently found in the paper bin and should have been in the container bin while film plastic was found in the container bin and should have been in the paper bin.

4.2 Phase 2: Deliver In-unit Bags, P&E Materials and Carts

During Phase 2 the following was completed:

- Property owners and/or superintendents were contacted to arrange visits to each multi-residential building.
- Blue bags and promotion & education materials were delivered to 143 buildings, representing 6,217 residential units.
- New recycling posters were posted in all 143 buildings.
- 69% of blue bags were hand delivered to residents in 98 buildings. Due to security concerns and the large number of seniors in Peterborough, we were asked not to deliver bags door-to-door to 45 buildings or 31%.

- Outreach activities were completed at some buildings. This included a BBQ at one site where the bags were distributed. We also attended a quarterly tenant meeting for a townhouse complex at which time blue bags were distributed.

4.2.1 Print materials

A project goal was to distribute new print materials to promote recycling and educate building residents and staff about the new two-stream system and about what can and cannot be recycled. Peterborough participated with other municipalities under a Continuous Improvement Fund project to develop print templates (resident flyers, posters and signs for buildings, container labels and a guidebook for superintendents, property managers and building owners) through the CIF website. The template materials were then customized with Peterborough specific program information. Summary information is shown in Table 4.10

Peterborough followed the *CIF Best Practice Guidelines* recommended strategies for distribution of print materials, which required that Peterborough staff:

- Distribute print materials directly to residents,
- Distribute and display posters at multi-residential properties, and
- Apply labels to recycling containers.

These materials were distributed and applied by municipal staff.

Table 4.10: Summary of Promotion & Education materials used

Promotion & Education component	Number distributed	Method of distribution
Resident flyers	6,500 1 per residential unit	By municipal staff to each unit and at outreach activities
Posters	500 2 to 4 per building, depending on bldg size	Posted by municipal staff on each floor (chute room), laundry room, lobby, mail room, etc.
Cart labels	244 comingled container labels 306 paper product (and film plastic) labels	By municipal staff

- Peterborough purchased 10,000 Recycling Moments Brochures: A Chance Encounter and A Family Affair, illustrated below. 500 Recycling Posters were purchased; 125 of each of the four (A Chance Encounter, A family Affair, Everybody's Doing It and The Rendezvous from Lashbrook Marketing & Public Relations at a total cost of \$2,759.25 (including tax).
- The two Recycling Moments brochures were distributed to residents living in the multi-residential units in Peterborough.
- Recycling Moments Posters were put up in each building usually in recycling rooms, laundry rooms, elevators or common areas of the buildings.
- Cart labels were put on carts as required.
- The Recycling Guide Book is a great way to revisit the high priority buildings to re-educate, re-poster and re-label if required. This will be reviewed for future work.
- It was noted above, that the contamination and stream mixing of recyclables improved after the distribution of the promotion and educational materials.

The networking opportunities and relationships established during this project are "priceless" and will go a long way in improving the recycling in multi-residential facilities in Peterborough.

Examples of the print materials are illustrated below.

Do not recycle:

PLASTIC
Toys
Caulking tubes
Plastic food wrap
Drinking cups
Motor oil jugs
Koolaid Jammers
Bubblewrap
Straws
Hangers
Plastic utensils
Packing peanuts
Drink lids
Chip bags

GLASS
Drinking glasses, dishes
Cups, crystal
Window glass
Light bulbs
Mirrors
Pottery
Pots and pans

METAL
Food-contaminated foil
Coat hangers
Pots
Batteries

PAPER/FIBRE
Tissues
Waxed paper
Foil gift wrap
Waxed cardboard
Foil wrapping paper
Ice cream cartons
Paper towels

Peterborough Recycles

Take a moment to sort and recycle. Every time you place materials in your recycling container you accomplish at least three good deeds for the day. First, you are diverting waste from the landfill, and thus extending its life. Second, you are ensuring materials such as aluminum and paper that have many lives, can be used and reused to their fullest. And third, you are helping to save money. The sale of recyclable materials has provided over \$15 million in revenue to the City of Peterborough in 2008.

THINK BLUE LIVE GREEN

This project has been delivered with the assistance of Waste Diversion Ontario's Continuous Improvement Fund, financed by Ontario municipalities and stewards of blue box waste in Ontario.

Printed on 100% recycled paper.

DROP EVERYTHING!

All that stuff that isn't garbage, and doesn't go in your blue recycling bin, can now be dropped off at convenient collection depots, for reuse, recycling or responsible disposal:

- Leftover paint and solvents, empty oil containers and used oil filters, antifreeze, propane tanks, fertilizers and pesticides, non-rechargeable batteries, televisions, computers and peripherals, fax machines and printers.

Do your bit to keep our communities green. Learn more at the website hosted by Stewardship Ontario and Ontario Electronic Stewardship:

dowhatyoucan.ca

OES **DO WHAT YOU CAN** **Stewardship Ontario**

Household hazardous waste and electronics are accepted at the Peterborough HHW Depot located at 400 Pido Road.
Open Wednesday - Saturday 8:00 am - 4:00 pm
For more information on apartment recycling, please visit our website at www.bluesmores.ca or www.peterborough.ca/waste

RECYCLE OFTEN

Your Guide To Recycling.

Do not recycle:

PLASTIC
Toys
Caulking tubes
Plastic food wrap
Drinking cups
Motor oil jugs
Koolaid jammers
Bubblewrap
Straws
Hangers
Plastic utensils
Packing peanuts
Drink lids

Chip bags
Plastic containers for food storage

GLASS
Drinking glasses, dishes
Cups, crystal
Window glass
Light bulbs
Mirrors
Pottery
Pots and pans

METAL
Food-contaminated foil
Coat hangers
Pots
Batteries

PAPER/FIBRE
Tissues
Waxed paper
Foil gift wrap
Waxed cardboard
Foil wrapping paper
Ice cream cartons
Paper towels

Peterborough Recycles

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RECYCLE MORE

Your Guide To Recycling.

RECYCLING MOMENTS:

A CHANCE

Encounter

RECYCLE OFTEN

Your Guide To Recycling.

RECYCLING MOMENTS:

A FAMILY

Affair

RECYCLE MORE

Your Guide To Recycling.

4.2.2 Outreach activities and in-unit recycling bags

Speaking to Residents ~ door to door outreach

- Door-to-door outreach was performed at 98 out of 143 buildings.
- Recycling material was explained to them and placed inside each blue bag.
- People were receptive and excited to be receiving their free blue bag.
- We used this portion of the project to confirm our data, i.e. names of superintendents, number of units, number of caddies, building names, etc. Some information received in Phase I of the project that was obtained over the telephone was incorrect. This was corrected and used in the final portion of the project.

Superintendents

- One of the biggest advantages to this project was the relationships that were built during this phase of the project.
- Superintendents do not hesitate to call if they have any questions or need more educational material.

Challenges

- This phase of the project was a challenge due to time constraints; this was a very labour intensive phase of the project.
- Another challenge was to get in touch with the superintendents or owners and to set up appointment times to deliver the blue bags. This was very frustrating and time consuming to try and find them or if they were late it would throw the whole schedule off.
- There were some safety issues at some of the buildings and notes were made that one person should not visit these sites alone.

4.2.3 Increase recycling container capacity

Having enough storage space for recyclables is one of the most critical factors in a successful recycling program and it is important to address this first before other program improvements are put in place. Recycling storage space is referred to as 'capacity' and is the shared recycling containers used by building residents to deposit their recyclables. In the City of Peterborough, 95-gallon roll-out carts are used for the multi-residential collection program. These containers are supplemented with personal recycling bags, which are handed out to residents for their 'in-unit' use.

During Phase 1 site visits the baseline container quantities were recorded and information was collected about where containers could be relocated within the building to provide more convenience to residents. Site visits also provided the opportunity to determine if additional containers are required and where additional containers would be stored and set out for collection.

Prior to 2009 carts were provided at no charge to building owners as they required them. During this project, buildings with insufficient carts were identified and provided carts. Going forward the City will charge property owners for carts at a rate of \$75.00 each (including tax) and if damaged or broken, the carts are replaced free of charge.

4.2.4 How much recycling capacity is being required?

Based on the provincial target of recycling 70% of all recyclables, the best practices recommendation is to provide each residential unit with a minimum of 50 litres of storage capacity. This is equivalent in size to a standard 14 gallon blue box. In terms of multi-residential carts, the best practices guidelines recommend one 95 gallon (360 litre) cart for every 7 residential units. The guidelines represent average requirements and it is assumed that at the building level there will be variations depending on the demographics.

The Table below provides information of recycling capacity before and after project implementation.

Table 4.11: Total number of recycling containers

	Phase 1: Baseline May-June 2009	Phase 3: Post implementation Oct-Dec 2009
Units with recycling service	6,263	6,217
95 gallon carts (Paper & comingled)	910	941
Total program capacity in litres	327,600	338,760
Capacity per unit (l/unit)	52	54

This project funded 100 carts. The chart below details the carts added to the project either by the replacement or purchasing of carts, totalling 129 carts.

Table 4.12 Carts added to the project

Carts	During Project	After Project	2010
Purchased	31	11	22
Replaced	7	15	43
TOTAL	38	26	65

While the average capacity per unit is shown to be at best practice levels during Phase 1 and Phase 3 site visits, because some buildings are well above this level, there are many buildings with not enough carts. The following was also noted in the site visits:

- Phase I had 95 buildings or 66% at Best Practice Recommendation for unit to cart ratio while 49 buildings or 34% were not at the Best Practice Recommendation.
- Phase III had 95 buildings or 68% at the Best Practice Recommendation for unit to cart ratio while 44 buildings or 32% were not at the Best Practice Recommendation.
- The City of Peterborough would like to have all multi-residential buildings at the Best Practice Recommendation for unit to cart ratios.

4.3 Phase 3: Site visits to collect post-implementation data

Phase 3 Activities:

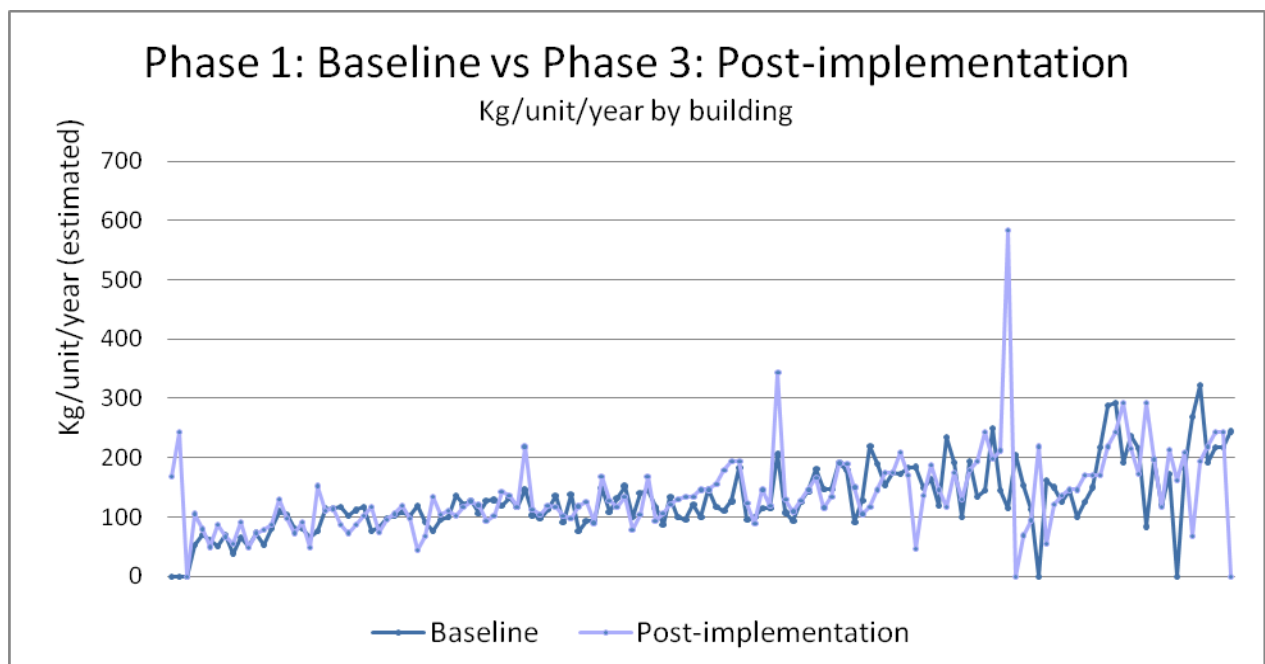
- If required (indoor recycling), property owners and superintendents were contacted to complete site visits.
- 143 buildings with 139 recycling depots were visited, representing 6,217 residential units.
- The 2009 Multi-Residential Performance Evaluation forms were completed on each recycling depot recording recycling program information, performance monitoring and barrier identification.

- Buildings were re-assessed for placement of posters explaining the two-stream system recycling program as well as the Recycling Moments posters.
- If required, carts were cleaned before affixing any label(s).

4.3.1 Estimating recycling rates

In Phase 1, baseline visual inspections were completed. This was repeated in Phase 3 after promotion & education materials, new carts, and in-unit bags were delivered. The two data sets were compared. The Phase 3 data is referred to as 'post-implementation.' The Graphs and Table below compare the results. Graph 4.13 provides data points for each building for baseline and post-implementation data. The two lines are very close indicating minimal changes between the two sets of inspections. However it can be seen that for many buildings the post-implementation data point is greater than the baseline data point. Graph 4.14 is a summary of the data presented in Graphs 4.13 and presents the average recycling rate (based on the visual audits) of the baseline and post-implementation data. The data shows a 6% increase in the recycling rate.

Graph 4.13: Comparative building recycling rates



Graph 4.14: Summary of baseline and post-implementation recycling rates

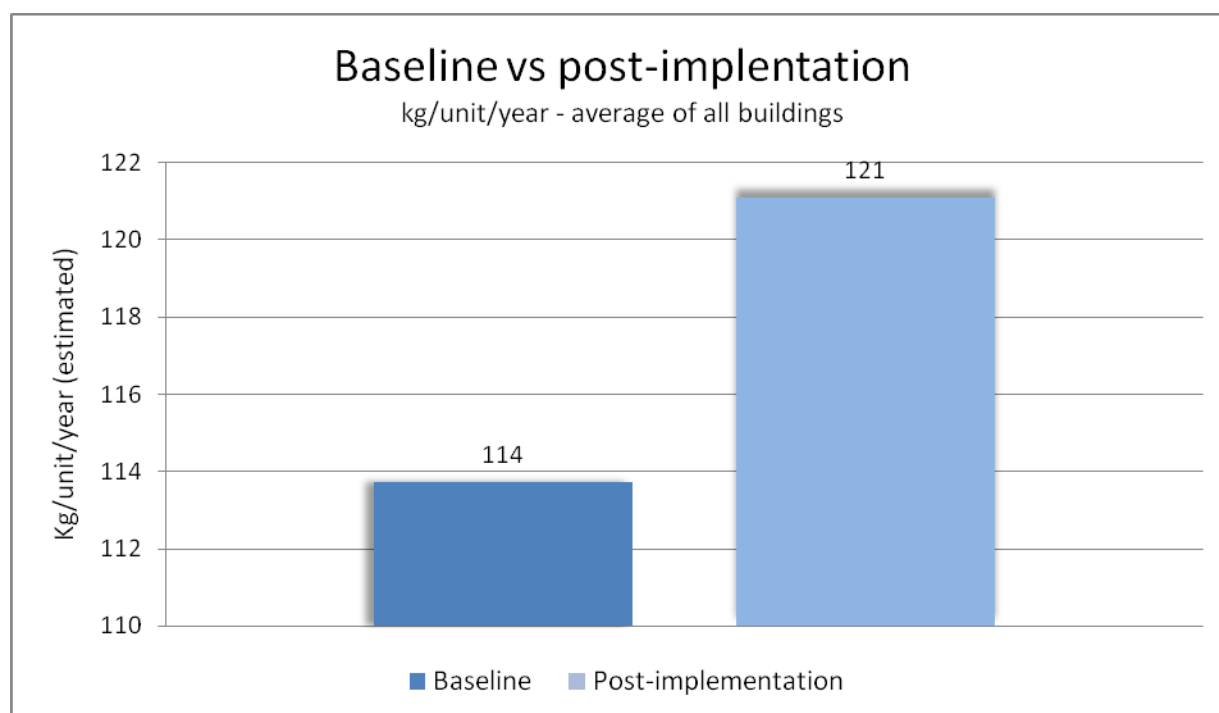


Table 4.15: Distribution of buildings by recycling rates

Recycling rate Kg/unit/yr		Phase 1: Baseline		Phase 3: Post-implementation	
Low	< 60	9	6%	7	5%
Mid	60 to 120	63	45%	56	40%
High	>120	68	49%	77	55%
Total buildings		140	100%	140	100%

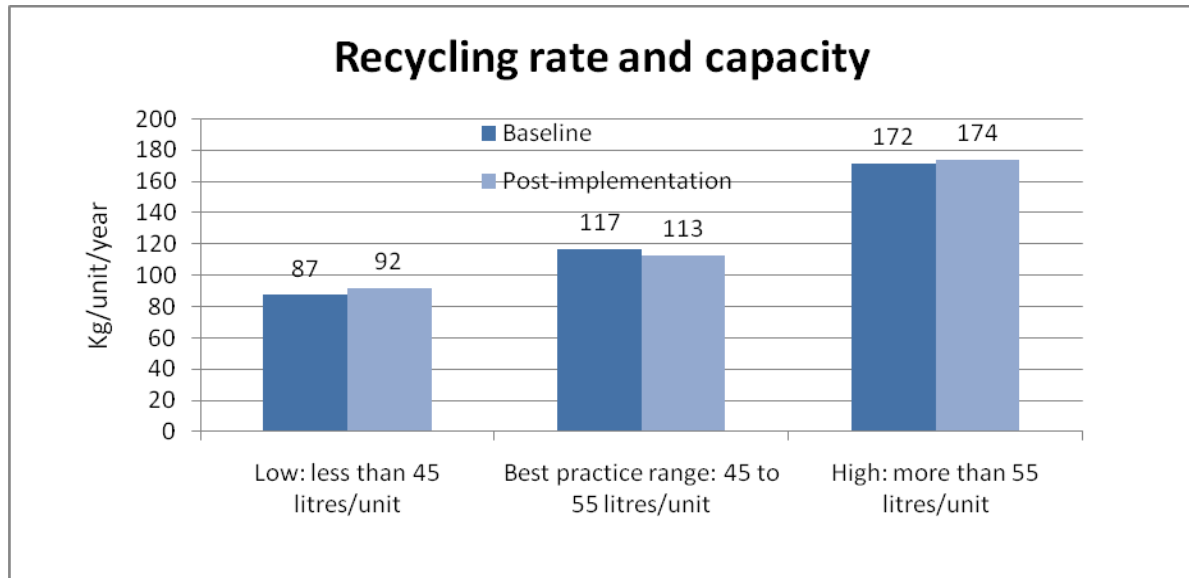
In the example of Table 4.15 it can be noted that 55% of buildings are ranked within the 'high' recycling rate, compared to 49% prior to implementing best practices. Criteria of what is considered 'low,' 'mid' and 'high' is arbitrary and as the program improves the standards will improve.

Table 4.16: Recycling capacity and recycling rate

Capacity range	Phase 1: Baseline		Phase 3: Post-implementation	
	Number of Buildings	Kg/unit (average)	Number of Buildings	Kg/unit (average)
Low: less than 45 litres/unit	46	87	44	92
Best practice range: 45 to 55 litres/unit	17	117	16	113
High: more than 55 litres/unit	83	172	84	174

The information in Table 4.16 can also be represented in the Graph 4.17 below. They illustrate, for example, that the average recycling rate for buildings that provide more than 55 litres per unit recycling capacity (after implementation of the project initiatives) was 174 kg per unit per year (estimated based on visual audits). Buildings with more or less than the recommended capacity (50 litres) are shown to have greater and lesser recycling rates as indicated in the Graph.

Graph 4.17: Recycling capacity and recycling rate, baseline and post-implementation



5. Project budget and schedule

The budget staff allocation and schedule for the project are provided in Tables 5.1 and 5.2.

Table 5.1 Project budget

Description	Project Budget	CIF Contribution
Project planning & implementation, site visits, benchmarking, data input	\$23,000	\$4,100
Final Report	\$1,750	\$0
Mileage	\$900	\$450
100 carts	\$11,100	\$5,550
In-unit bags	\$6,300	\$3,150
Printing of P&E - posters, brochures	\$4,000	
Project 174 Budget	\$47,050	\$13,250
Percent Funded		28%
CIF contribution under CIF 166 to this project		
Design of P&E materials	\$7,500	\$7,500
Total value of project	\$54,550	\$20,750
CIF contribution including CIF 166		38%

Table 5.2: Staff allocation hours to project

Phase	Completion Dates (2009)	Number of Staff Hours	Average Kilometres per Building
1	May 27 - June 24	47 hours	3
2	September 16 - October 21	234 hours	3.6
3	October 19 - December 1	51 hours	2.5
	TOTALS	332 hours = 47.5 days = 2.2 hr/ building	9 km driven per building

6. Summary comments

The following work was completed under CIF Project 174:

Develop & Maintain a Database of Buildings

A database was created for the multi-residential buildings in Peterborough. This database includes:

- building address
- building name
- building units
- number of floors
- superintendent / owner name; contact information
- collection day
- number of caddies; paper and container
- caddy serial numbers
- demographics of building
- recycling depots; indoor or outdoor
- label information
- poster information
- measure of cart fullness
- barrier identification
- contamination or stream mixing issues
- site visit dates

Benchmark Performance

- This was the first project of this sort for multi-residential units in Peterborough.
- Visual inspections were completed on all multi-residential units
- Performance indicators were monitored during the project
- Work with the Housing Division to bring the worst ranked buildings in Peterborough up to a better ranking.

Provide adequate Recycling Bin Capacity

- To try and reach our goal of 100% Best Practices for Unit to Cart Ratio a letter will be drafted to each multi-residential building in non-compliance. This letter will advise them of our Waste Management by-law that requires mandatory recycling of one (1) cart for every seven (7) units. This letter would state that their building does not meet this requirement and would ask them to purchase a certain number of carts that would bring them to the Best Practice level.
- The unutilized capacity of 176 tonnes per year gives Peterborough the opportunity to fill these unutilized carts through P&E.
- A number of superintendents have called to order more carts after the project completion due to the increase in recycling in their building.
- Since we have delivered the blue bags their recycling has drastically increased.

Provide Promotion & Educational Materials

- Peterborough purchased 10,000 Recycling Moments Brochures: A Chance Encounter and A Family Affair. 500 Recycling Posters were purchased; 125 of each of the four (A Chance Encounter, A family Affair, Everybody's Doing It and The Rendezvous from Lashbrook Marketing & Public Relations at a total cost of \$2,759.25 (including tax).
- The two Recycling Moments brochures were distributed to residents living in the multi-residential units in Peterborough.
- Recycling Moments Posters were put up in each building usually in recycling rooms, laundry rooms, elevators or common areas of the buildings.
- Cart labels were put on carts as required.
- The Recycling Guide Book is a great way to revisit the high priority buildings to re-educate, re-poster and re-label if required.
- It was noted above, that the contamination and stream mixing of recyclables improved after the distribution of the promotion and educational materials.

The networking opportunities and relationships established during this project are "priceless" and will go a long way in improving the recycling in Multi-Residential facilities in Peterborough.

7. Appendices

Appendix 1: Phase 1 and Phase 3 building counts

PRE: PHASE I DATA ~ original data

Collection Day	Number of		Number of Depots			Unit to Cart Ratio			
	Units	Buildings	Indoor	Outdoor	Total	0-7	8-10	11-15	16-23
Tuesday	2,980	58	18	40	58	30	18	8	2
Wednesday	1,849	37	14	23	37	25	6	5	1
Thursday	787	22	6	16	22	19	3	0	0
Friday	1,214	33	10	23	33	21	8	4	0
TOTAL	6,830	150	48	103	151	95	35	17	3

PRE: PHASE I DATA (excluding Retirement Home Information (597 units & 6 buildings))

Collection Day	Number of		Number of Depots			Unit to Cart Ratio			
	Units	Buildings	Indoor	Outdoor	Total	0-7	8-10	11-15	16-23
Tuesday	2,626	54	16	38	54	30	16	7	1
Wednesday	1,743	36	14	22	36	25	6	5	0
Thursday	650	21	5	16	21	19	2	0	0
Friday	1,214	33	10	23	33	21	8	4	0
TOTAL	6,233	144	45	99	144	95	32	16	1

POST: PHASE III DATA

Collection Day	Number of		Number of Depots			Unit to Cart Ratio		
	Units	Buildings	Indoor	Outdoor	Total	0-7	8 - 10	11 - 15
Tuesday	2,664	57	17	37	54	32	14	8
Wednesday	1,685	36	14	21	35	26	6	3
Thursday	654	19	4	14	18	16	2	0
Friday	1,214	31	10	22	32	21	9	2
TOTAL	6,217	143	45	94	139	95	31	13

Total Changes in Building Numbers

- Buildings in Phase I were 150 and in Phase III dropped to 143 ~ difference of 7 buildings. The retirement homes do not have kitchen units and, therefore, no recycle bins ~ it is done through the cafeteria on site.

Tuesday Building Difference = -1 building

- Jackson Creek Retirement Home was removed
- Rubidge Hall Retirement Residence was removed
- Royal Gardens Retirement Home was removed
- Dublin Arms was removed
- 85 Lansdowne Street was added (moved from Wednesday collection)
- 1 & 2 Stornoway Place ~ 1 building was added (two separate buildings)
- 282 – 288 Romaine Street ~ 1 building was added (two separate buildings)

Wednesday Building Difference = -1 building

- Applewood Retirement Home was removed
- 85 Lansdowne Street was removed (moved to Wednesday collection)
- 1781 & 1793 Cherryhill Road ~ 1 building was added (two separate buildings)

Thursday Building Difference = -3 buildings

- Canterbury Gardens was removed
- Towerhill Village was counted as two sites and should be one site
- Peter Robinson Place was counted as two sites and should be one site

Friday Building difference = -2 buildings

- Sunshine Homes was counted as 4 buildings in Phase I ~ since it is one complex it is now counted as one building (-3 buildings).
- Parkhill / Juliett ~ 1 building was added (two separate buildings)

Total Changes in Unit Numbers

- Units in Phase I were 6,830 and in Phase III were 6,217 ~ difference of 613 units

Tuesday Unit Difference = -316 units

- Jackson Creek Retirement Home was removed (-69 units)
- Add 85 Lansdowne Street West (from Wednesday) (+12 units)
- Rubidge Hall Retirement Residence (-129 units)
- Royal Gardens Retirement Home (-126 units)
- Dublin Arms (-30 units)
- 1110 Clonsilla should be 12 units instead of 10 (+2 units)
- 302 Hunter Street West should be 13 units instead of 10 (+3 units)
- 282 – 288 Romaine Street should be 30 units instead of 15 (+15 units)
- 490 Dickson Street should be 19 units instead of 16 (+3 units)
- 380 Brock Street should be 8 units instead of 9 (-1 unit)
- 215 Edinburgh Street should be 18 units instead of 16 (+2 units)

- 333 Brock Street should be 110 units instead of 109 (+1 unit)
- 1 & 2 Stornaway Place should be 126 units instead of 119 (+7 units)
- 235 King Street should be 92 units instead of 98 (-6 units)

Wednesday Unit Difference = -164 units

- Applewood Retirement Home was removed (-106 units)
- 85 Lansdowne Street West should be on Tuesday's list (-12 units)
- 2387 Kawartha Heights Blvd. Should be 17 units not 18 as stated (-1 unit)
- 246 Spillsbury Drive should be 35 units not 80 as stated (will be 80 units when construction is completed in 2012) (-45 units).

Thursday Unit Difference = -133 units

- Canterbury Gardens was removed (-137 units)
- 840 Water Street was counted as 30 units in Phase I. When performing Phase II of the project and actually going into each unit to deliver the blue bags it was noted that this building actually has 34 units and not 30 (+4 units).

Friday Unit Difference = 0 units

- Units ~ same as Phase III (no change)

Total Changes in Depot Numbers ~ 5 depots

Tuesday Depot Difference ~ no depot changes

- 550 McDonnell Street (Bonnerworth Lodge) should be an inside depot so numbers have been changed to reflect this in Phase III. (indoor = 17; outdoor = 37)

Wednesday Depot Difference = -1 depot

- 85 Lansdowne Street was moved to Tuesday (-1 outdoor depot)

Thursday Depot Difference = -3 depots

- 77 Towerhill Village is one building and one indoor depot ~ not two (-1 indoor depot)
- Peter Robinson Place (George Street) is one outdoor depot ~ not two (-1 outdoor depot)
- 467 Highland Road and 428 Bellevue Street share a depot (-1 outdoor depot)

Friday Depot Difference = -1 depot

- 2181 Walker Avenue shares an outdoor depot with 2183 Walker (1 depot ~ not 2)

Appendix 2: Site Visit Form

Multi-residential Recycling Program: Site Visit Form

Address (full mailing) : _____

Units: _____ Floors: _____ Site Visit Date & Day of Week: _____

Condo / Rental / Senior / Student / Co-op / Public

Recycling Collection Day(s) _____

Garbage: Municipal / Private

Recycling: Municipal / Private

Garbage Collection Day(s): _____

Contact Information

Property Manager: Same as owner ☐

Company: _____

Name: _____

Phone #: _____

Cell #: _____

E-Mail: _____

Address: _____

On-Site Contact: Super / Property Manager / Owner / NA

Name: _____

Phone #: _____

Cell #: _____

E-Mail: _____

Address: _____

Performance Evaluation

Recycling Containers: # of 65 gal = _____ # of 95 gal = _____ # bins x size = _____

Stream 1: _____ # Cont _____ # full or part full containers: _____

Stream 2: _____ # Cont _____ # full or part full containers: _____

OCC : approx quantity

Barrier Evaluation: Rate on a scale of 1 to 3: 1 = Bad and requires attention, reserve rate of 3 for Excellent

OCC _____ Contamination _____ Stream mixing _____ Accessibility _____

Loose materials _____ Overflowing carts _____ Area clean _____ Area well light _____

Labels & Signage _____

Recycling & Garbage Area Description – check all that apply

Garbage: # bins x size _____ Or curbside ☐ Garbage Chutes ☐ Weekly Pickup ☐ Twice/wk ☐

Recycling Area: Outdoor ☐ Outdoor under cover ☐ Inside room ☐ Main Fl ☐ Under ground ☐ Collect from each floor ☐

Number of Recycling Depots _____ Twinned with garbage ☐ Recycling containers shared with other buildings ☐

Addresses that share _____

Room to add extra recycling containers ☐ Where _____

Comments:

Appendix 3: Guide to assessing recycling barriers

The ranking guidelines below are used to assess barrier to recycling.

1. OCC - indicator of how OCC is managed
 - Requires attention. Little to none of the cardboard boxes have been broken down and lay in heaps beside and around the recycling bins. There is also big, unbroken down cardboard boxes in the bins making inefficient use of the bin space.
 - OK. Some of the cardboard boxes have been broken down, bound and laid flat beside the recycling bins. There are some unbroken down boxes laying around the bins, and flattened cardboard lying beside the bins unbound. Most importantly, there was an effort to ensure the cardboard is being handled as per municipal instructions.
 - Excellent. All cardboard boxes have been broken down, bound and laid flat beside the recycling bins. There is no visible cardboard, broken down or other, in the bins and if there is, it is only in very small amounts, or small in size. OR Cardboard is managed with a front end or other style bulk bin
2. Contamination – an indicator of materials not accepted in program
 - Requires attention. The recycling bin is so contaminated that it can be considered garbage. There seems to be an equal mixture of both contaminants and recyclables.
 - OK. Some contaminants were found in the bins and are items commonly mistaken for recyclables, but not included in program (i.e. other plastics, scrap metals).
 - Excellent. There are no visible contaminants in the recycling bins.
3. Stream Mixing – indicator of mixing between streams (eg., paper in the container stream, etc.)
 - Requires attention. Hard to tell one recycling bin from another due to stream mixing. Or considerable amounts of stream mixing between recycling bins. Labels are missing.
 - OK. There are small amounts of stream mixing but both the container and paper bins are immediately distinguishable from one another. Recycling bins can be thoroughly separated with a quick sort of one or two misplaced items. Containers are labeled.

- Excellent. There is no apparent stream mixing in the recycling bins.
4. Accessibility – how accessible is the recycling area to building residents
 - Requires attention. The recycling depot is towards the back of the parking lot and it may be difficult for residents to even recognize the bins as their own. And the depot is difficult to access due to excess amounts of garbage and other obstacles. Snowed under in winter. Lids cannot be lifted due to snow and ice building up.
 - OK. The recycling depot is located in the parking garage or just outside at an exit. The recycling depot is inside the building, in a room and or designated area, immediately off the lobby or via the back door of the elevator.
 - Excellent. Recycling access is within the building and is as convenient as garbage disposal.
 5. Loose Materials – are there loose recyclables or garbage in the recycling area
 - Requires attention. There are a lot of loose materials around the depot, and includes recyclables, garbage, furniture, mattresses etc.
 - OK. There is a small amount of loose materials around the depot.
 - Excellent. There are no loose materials seen at all anywhere around the depot.
 6. Overflowing Carts – indicates that there are not enough carts
 - Requires attention. All the bins are overflowing with bags of recyclables lying on top of, and around the bins at the recycling depot. Or all bins are full and the cart: unit ratio suggests more are required.
 - OK. There is some spare capacity and the cart: unit ratio is good. A minimum of one cart per ten units
 - Excellent. There are no overflowing carts and extra capacity is available. Cart unit ratio is at best practices: one cart per 7 units.
 7. Area Clean – how clean and tidy is the recycling area
 - Requires attention. The recycling depot is surrounded by recyclables and garbage, including bigger items (i.e. furniture, mattresses). The

bins have been placed in a disorganized fashion, with not much thought put into convenience and accessibility.

- OK. Area is clean but there may be a small amount of loose recyclables due to overflowing carts and excess cardboard around the bins. Otherwise, the recycling depot has been well organized and thought out.
- Excellent. Area is very clean. There is no garbage or recyclables lying on the floor or anywhere within the vicinity of the recycling depot. The recycling depot has been well organized and thought out.

8. Area Well Lit – how well lit is the recycling area

- Requires attention. Outdoor depots are far away from any source of lighting and will be completely in the dark in evenings. Indoor lighting is insufficient for residents to see and therefore, to efficiently use the recycling depot. Passage to depot is not lit.
- OK. There is lighting within a close vicinity of the outside depots, but may not be directly overhead the depot. Indoor lighting is sufficient but is somewhat dim and not as bright as it could be.
- Excellent. There is a lot of lighting at the depot, consisting of either a spotlight directly above outside depots or bright lights within the indoor depots. Passage to depot is lit.

9. Labels and signage – condition & accuracy of labels on recycling containers & signage in recycling area

- Requires attention. Labels or signs are absent, worn beyond readability and out-of-date. The program may have changed to single stream but all signs and labels indicate a 2-stream program. Signs and labels are handmade by building staff, and may give incorrect information. Lack of labels is resulting in contamination and stream mixing..
- OK. Information is correct.
- Excellent. All containers are labelled properly. Clear signs in recycling area. Building staff may have a well made sign board with samples of non-recyclables attached.