Executive Summary

The City of Hamilton currently has a two-stream recycling program for multi-residential buildings that requires residents to put their “papers” in one recycling cart and their “containers” in a separate recycling cart.

The City of Hamilton found that through the use of visual audits, there was one primary concern: the mixing (cross-contamination) of Hamilton’s two recycling streams.

For that reason, a recommendation was made that staff conduct a pilot project investigating contamination levels and the effects of introducing a targeted education campaign and grey coloured “papers” carts to selected Multi-Residential dwellings in Hamilton.
The City of Hamilton’s waste diversion programs focus on the collection of dual-stream recycling, organics, and garbage from 152,000 single-family houses as well as 1,000 multi-residential buildings. In an effort to bolster education and participation in waste diversion programs, specifically in multi-residential buildings, a key barrier was uncovered. Tenants in most cases were participating in the recycling program but were confusing the dual-stream recycling carts - resulting in contamination of both waste streams.

Of the properties visited, 82% had at least one (acceptable) item placed in the wrong blue cart – either paper in the “containers” cart or containers in the “papers” cart. This is a significant concern because the City’s Material Recycling Facility (MRF) is designed to handle source-separated material.

Our goal was that by implementing a small-scale education program, we could decrease contamination in our dual-stream recycling program by 10% while maintaining participation in our pilot area. The City’s slogan, “Put Waste in the Right Place” was used in a campaign to reinforce the simple concept that recyclables in Hamilton must be separated.
Background

The City of Hamilton lies at the west end of Lake Ontario in the southern part of the province of Ontario, Canada. The City of Hamilton covers an area of approximately 113,000 hectares (436 square miles) and is a mix of urban, suburban and rural communities.

In December 2001, City Council adopted the Solid Waste Management Master Plan (SWMMP) that outlines how household waste in Hamilton should be managed over the next 25 years. The Master Plan recognizes that the City has to take responsibility for the waste that it creates.

As part of the SWMMP in August 2012, a team of six Organic Waste Leaders (OWLs) were hired and extensively trained in waste management and community-based social marketing so that they could determine the barriers to recycling and composting in multi-residential dwellings throughout Hamilton.

Their duties involved conducting research by interviewing property owners / managers, superintendents, and tenants of multi-residential buildings as well as completing visual audits of each waste stream. The resulting data was analyzed to find key trends in multi-residential dwellings throughout Hamilton.
Identifying the Problem

Initial Data Collection

Using a list of all the multi-residential properties in Hamilton that are eligible for City waste collection, each building superintendent was contacted. Properties such as those operated by City Housing, institutions (nursing homes, shelters, etc.), and properties that receive curbside pickup are not considered “multi-residential” so they were removed from the list.

Superintendents were asked to complete a brief survey about the recycling program at their building. “Layout” surveys were also used to record physical characteristics about the building. Co-ordination of both surveys during the same visit was preferred. “Visual audits” of the building’s carts were conducted shortly before or on a given building’s pick-up day. The surveys were done in person, to be more approachable, and so as to best evaluate the superintendent’s responses. This created a supportive environment, allowing superintendents to be comfortable, open, and honest about the challenges and barriers they face with their recycling program. After survey and audit data was collected it was entered into a database. This made it easy to evaluate and analyze the data. A summary of the total number of surveys:

<table>
<thead>
<tr>
<th>Superintendent</th>
<th>Layout</th>
<th>Audit</th>
</tr>
</thead>
<tbody>
<tr>
<td>483</td>
<td>475</td>
<td>424</td>
</tr>
</tbody>
</table>

Initial Results

The data was analyzed to find the biggest trends in multi-residential dwellings throughout Hamilton. It was found that the barriers and superintendent’s recommended improvements were very diverse. This made it hard to find a single problem in need of a single solution. However, through the visual audits, the team noticed one primary concern: the mixing (cross-contamination) of Hamilton’s two recycling streams.
Cross-Contamination (Mixed recycling streams)

82% of properties had at least one (acceptable) item placed in the wrong blue cart – either paper in the “containers” cart or containers in the “paper” cart. This is a significant concern because the City’s Material Recycling Facility (MRF) is designed to handle source-separated material. Carts are currently stickered to identify which recycling stream the cart is used for, but this is not proving to be effective. The graphics on the current stickers fade away, requiring them to be replaced annually.

Recommendation

Based on these findings, the recommendation was made to test a communication strategy designed to educate tenants on proper recycling separation and to make it easier to identify the “papers” and “containers” recycling carts. This visual distinction was based on using a different coloured recycling cart for each stream (papers vs. containers).

Materials that were being used prior to the pilot

City-wide, blue carts are labeled with stickers indicating what should go in each respective cart. There are two stickers: a white “containers” sticker, and a black “papers” sticker. It was found that buildings with clearly identified carts using stickers collected around 10% more recyclable material than buildings that did not clearly identify their carts. Approximately 84% of carts have clearly legible stickers.
Since the City of Hamilton requires recycling to be source separated, it is critical that keeping papers and containers separate is emphasized in all communication material distributed to residents. The following items are examples of material distributed to multi-residential buildings prior to the contamination reduction pilot:

- Black and white bin stickers
- Recycling station posters
- Fridge magnets
- “Put Waste in the Right Place” guide
### Pilot Goals and Strategy

<table>
<thead>
<tr>
<th>Goal / Objective</th>
<th>Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>The major goal of the pilot was to educate tenants on proper recycling separation with the hopes of 10% contamination reduction by the end of the two month pilot.</td>
<td>Provide a comprehensive education campaign to teach tenants within the designated pilot areas how and why to separate their recycling.</td>
</tr>
<tr>
<td>Make recycling easier by creating a visual distinction between papers and containers recycling carts.</td>
<td>By providing different coloured recycling carts for papers (grey) and containers (blue), tenants will be able to easily distinguish between the two streams.</td>
</tr>
</tbody>
</table>
| Educate tenants on how to properly sort their recycling. | Distribute a communication package highlighting recycling sorting to all tenants within pilot buildings. The package contains:  
  - Tenant recycling guide  
  - Fridge magnet  
  - In-unit recycling bins |
| Maintain two-way contact with superintendents | In person meetings with all superintendents to provide any necessary recycling tools as well as to receive feedback about the pilot. |

### Target Audience

Our target audience covered a diverse range of people, but was limited to:

1) Multi-residential tenants that use the blue carts; more specifically, the ones who currently contribute to cross-contamination.

2) Tenants who do not use the carts on a regular basis

3) Superintendents
Anticipated Obstacles

Most obstacles foreseen during the planning process of the pilot project were similar to barriers that we are constantly faced with in other areas of our waste diversion programs.

Communication with Superintendents
Many superintendents are often hard to get a hold of due to a number of factors. Most simply have a full schedule daily and do not readily answer phone calls or e-mails.

Language Barriers
Hamilton has a vibrant multicultural population with a large number of residents residing in multi-residential buildings.

Information Overload
In this day in age it is not uncommon to be constantly bombarded with information and advertisements on a daily basis. Getting our message out and ensuring it is heard is often difficult.

Anticipated Opportunities

Here are some examples of opportunities identified to help with meeting our pilot projects goals.

Participation
Many residents regularly participate in the recycling program and recycle acceptable items.

Passionate Staff
Our staff working in Community Outreach are engaged and passionate about what they do.

Existing Knowledge
We have used Community-Based Social Marketing tactics in numerous projects previously.
As part of the SWMMP in August 2012, a team of six Organic Waste Leaders (OWLs) were hired and extensively trained in waste management and community-based social marketing so that they could determine the barriers to recycling and composting in multi-residential dwellings throughout Hamilton.

Their duties involved conducting research by interviewing property owners / managers, superintendents, and tenants of multi-residential buildings as well as completing visual audits of each waste stream. The resulting data was analyzed to find key trends in multi-residential dwellings throughout Hamilton.

Implementation / Execution

Pilot Synopsis

In order to reduce the amount of cross-contamination between “papers” and “containers” recycling in multi-residential buildings, we selected ten buildings to participate in the pilot. The ten buildings fell into one of five “building type” categories in order to ensure an adequate sample. The five building types are explained below in the Pilot Areas section.

1. Five buildings received different coloured carts for their “papers” blue carts along with the “Multi-Residential Communication Package”
   - The buildings selected total 251 units
   - These buildings make up the experimental group

2. The other five buildings only received the “Multi-Residential Communication Package” with no changes to the carts will be made.
   - The buildings selected total 303 units
   - These buildings make up the control group

A comprehensive waste audit was conducted at each of the buildings “containers” and “papers” blue carts to determine contamination levels before and after the pilot was rolled out.
Pilot Area

The five building categories targeted in the pilot study each have their own unique set of characteristics:

A. Buildings in **category A** were chosen to address tenant confusion reported by the superintendent and visual audits.

   *Small buildings (<15 units) with mixed recycling and the superintendent reported their biggest problem to be tenants lacking knowledge or contamination.*

B. Buildings in **category B** were chosen to address the concern that distance affects recycling in medium-sized buildings.

   *Medium buildings (16-30 units) that have carts outside and further than 75 feet from the access point.*

C. Buildings in **category C** were chosen to address disengaged supers in medium-sized buildings.

   *Medium buildings (16-30 units) that have poor blue cart programs and disengaged superintendents.*

D. Buildings in **category D** were chosen to address the lack of recycling communication in the buildings.

   *Large (>30 units) buildings that do not have posters and more than half the carts do not have legible stickers.*

E. Buildings in **category E** were chosen to address the mixed recycling in buildings with cultural and language barriers to recycling.

   *Large (>30 units) buildings with few English speakers.*
# Implementation / Execution

## Building Characteristics

<table>
<thead>
<tr>
<th>Building ID</th>
<th>Units</th>
<th>Total Carts</th>
<th>Paper Carts</th>
<th>PU day</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>9</td>
<td>2</td>
<td>1</td>
<td>Mon</td>
</tr>
<tr>
<td>A2</td>
<td>9</td>
<td>4</td>
<td>2</td>
<td>Wed</td>
</tr>
<tr>
<td>B1</td>
<td>16</td>
<td>4</td>
<td>2</td>
<td>Mon</td>
</tr>
<tr>
<td>B2</td>
<td>22</td>
<td>4</td>
<td>2</td>
<td>Tues</td>
</tr>
<tr>
<td>C1</td>
<td>26</td>
<td>3</td>
<td>2</td>
<td>Wed</td>
</tr>
<tr>
<td>C2</td>
<td>30</td>
<td>4</td>
<td>2</td>
<td>Tues</td>
</tr>
<tr>
<td>D1</td>
<td>48</td>
<td>6</td>
<td>2</td>
<td>Fri</td>
</tr>
<tr>
<td>D2</td>
<td>48</td>
<td>6</td>
<td>3</td>
<td>Tues</td>
</tr>
<tr>
<td>E1</td>
<td>204</td>
<td>18</td>
<td>9</td>
<td>Mon &amp; Thurs</td>
</tr>
<tr>
<td>E2</td>
<td>142</td>
<td>15</td>
<td>7</td>
<td>Wed</td>
</tr>
<tr>
<td>Totals</td>
<td>554</td>
<td>66</td>
<td>16</td>
<td></td>
</tr>
</tbody>
</table>
## Pilot Timeline

This project was conducted from June 3rd, 2013 – August 23rd, 2013 which included picking up recycling, auditing, preparing and delivering tenant packages and conducting tenant surveys.

- **PU** – Pick up all recycling carts at the building category
- **A** – Audit designated number of carts
- **R** – Replace the carts of the designated building
- **D** – Deliver multi-residential communication packages

<table>
<thead>
<tr>
<th>Date</th>
<th>Task</th>
<th>Mon</th>
<th>Tues</th>
<th>Wed</th>
<th>Thurs</th>
<th>Fri</th>
</tr>
</thead>
<tbody>
<tr>
<td>June 3-7</td>
<td>Pick-up/Audit</td>
<td>PU - A1</td>
<td>PU - B2</td>
<td>PU - A2</td>
<td>PU - E1</td>
<td>PU - D2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PU - B1</td>
<td>PU - C2</td>
<td>PU - C1</td>
<td>A - 8</td>
<td>A - 6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PU - E1</td>
<td>PU - D2</td>
<td>PU - E2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>June 17-21</td>
<td>Prepare Tenant Packages</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>June 24-28</td>
<td>Pick-up/Audit</td>
<td>PU - A1</td>
<td>PU - B2</td>
<td>PU - A2</td>
<td>PU - E1</td>
<td>PU - D2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PU - B1</td>
<td>PU - C2</td>
<td>PU - C1</td>
<td>A - 8</td>
<td>A - 6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PU - E1</td>
<td>PU - D2</td>
<td>PU - E2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>July 2-5</td>
<td>Audit</td>
<td>HOLIDAY</td>
<td>A - 9</td>
<td>A - 9</td>
<td>A - 8</td>
<td>A - 8</td>
</tr>
<tr>
<td>July 8-12</td>
<td>Deliver Tenant Packages/</td>
<td>D - A</td>
<td>R - B2</td>
<td>R - A2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Switch Carts</td>
<td>D - A</td>
<td>R - C2</td>
<td>R - E2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>D - B</td>
<td>R - D2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>D - C</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>D - D</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>D - E</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>July 15-19</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>July 22-26</td>
<td>Pick-up/Audit</td>
<td>PU - A1</td>
<td>PU - B2</td>
<td>PU - A2</td>
<td>PU - E1</td>
<td>PU - D2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PU - B1</td>
<td>PU - C2</td>
<td>PU - C1</td>
<td>A - 8</td>
<td>A - 6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PU - E1</td>
<td>PU - D2</td>
<td>PU - E2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
To overcome our specific challenge, we provided tenants with both communicative and physical tools:

Visually distinct grey recycling carts and in-unit containers
- Used to collect recyclable materials
- Only given to the experimental group
- New stickers on bins with photographic examples of acceptable material

“Put Waste in the Right Place” booklet
- Apartment version of 2013 Garbage and Recycling Guide
- Includes an insert with a “What Goes Where?” chart to help tenants with tricky items

Fridge magnet
- Longer life than a paper brochure
- Serves as a prompt – contains a short list of common items that need reinforcing on the fridge

In-building staff visits
- Staff made available at each building to answer any recycling questions
- Documented feedback for future pilots and programs
Budget

The proposed budget for the pilot program was initially set at $7,500. This number factored in graphic design, recycling bins, and print materials. By utilizing in-house graphic design and receiving in-kind recycling carts from our vendor, our total cost came in at $1,850 under budget!

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
<th>Cost ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Put Waste in the Right Place Recycling Booklet – Grey</td>
<td>350</td>
<td>625</td>
</tr>
<tr>
<td>Put Waste in the Right Place Recycling Booklet – Blue</td>
<td>400</td>
<td>695</td>
</tr>
<tr>
<td>“What Goes Where?” Chart Insert - Grey</td>
<td>350</td>
<td>370</td>
</tr>
<tr>
<td>“What Goes Where?” Chart Insert - Blue</td>
<td>400</td>
<td>405</td>
</tr>
<tr>
<td>Custom Print Envelopes</td>
<td>750</td>
<td>270</td>
</tr>
<tr>
<td>Full Colour Cart Labels</td>
<td>750</td>
<td>685</td>
</tr>
<tr>
<td>Grey Recycling Cart – 360L</td>
<td>16</td>
<td>In-Kind</td>
</tr>
<tr>
<td>Grey Recycling In-Unit Bin</td>
<td>264</td>
<td>1300</td>
</tr>
<tr>
<td>Blue Recycling In-Unit Bin</td>
<td>264</td>
<td>1300</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>5650</strong></td>
</tr>
</tbody>
</table>

Partnerships and Collaborations

With such a small pilot focused on only a sample of 10 apartment buildings, major stakeholders were limited. With the help of our vendor that supplies multi-res recycling blue carts city-wide, we were able to obtain an in-kind donation of 16 grey recycling carts. This enabled us to allocate a small amount of money to other areas of the pilot such as incentives and higher quality paper for our booklets.

Collaboration with superintendents and building managers was a key factor in ensuring the pilot was a success. By coordinating with superintendents, we were able to reach a larger audience at each building since they are at their buildings on a daily basis. They were able to distribute information to tenants that we were unable to contact during our building visits.
Delivering Program Elements

Our Outreach team includes six dedicated and motivated Organic Waste Leaders (OWLs) who were able to dedicate 2 months solely to this contamination reduction pilot. Without their driven effort this pilot would not have been a success. The project was divided into an audit phase (pre/post) as well as an education period to visit superintendents and tenants to educate them on proper recycling practices.

Audit Phase

Four audits were conducted in each study area (two pre-communication and two post-communication). The blue carts from each building were emptied into clear plastic bags, labeled, and transported to the Materials Recycling Facility for sorting. At the MRF, the staff sorted through the waste and categorized and counted the number of each item found in each stream. By utilizing efficient planning and accurate auditing practices of the collected material, this phase was delivered successfully without issue.

Education Phase - Superintendents

Each building superintendent was contacted and made aware of the pilot program during the planning process. After receiving commitment over the phone, we visited each building to conduct in-person meetings with the superintendents. Each was given a detailed overview of what involvement they were to have including distributing material to tenants that were unavailable during our visit, maintaining the new grey carts, and ensuring that they kept in contact to discuss any issues. We ensured that we gave each building representative the opportunity to have an in-depth conversation about our recycling programs and distributed the same material that were to go to tenants.
Implementation / Execution

Education Phase - Tenants

The audience in each of the ten buildings varied considerably in multiple categories such as education level, ethnicity, age, and general knowledge of recycling in Hamilton.

In an effort to foster two-way communication, we visited each tenant in a door-to-door campaign to talk about recycling and to distribute our communication package. We achieved a success rate of 90% in engaging at least one tenant in each unit. The remaining 10% that we were unable to communicate with were followed up with by the superintendent to ensure total coverage of our target audience.

When we spoke to tenants directly in their units, we described the program and explained how recycling works in Hamilton. This gave the residents some background knowledge as to why we must separate papers and containers before they get picked up. We successfully distributed material to all tenants that we visited with including “Put Waste in the Right Place” guides, “What Goes Where?” posters, and blue/grey in-unit recycling bins. The bins offered an additional distinction between the two streams and reinforced the fact that recyclables must be separated. We also took the opportunity to engage the tenants with a survey to better record feedback of our programs and to gauge overall recycling knowledge.
Implementation / Execution

**Improvement Over Current Program**

The contamination reduction pilot offered an improvement over our existing system, which provides a blue cart for both recycling streams, because of the physical differentiation between the two recycling carts. By providing a grey cart for paper recycling we were able to create a noticeable change in the behaviour exhibited by tenants using the carts in each of the study buildings.
Survey Results

Based on the results of the survey conducted during door-to-door visits of each unit, 78% of tenants stated that the provided grey carts and provided material made proper recycling easier. When asked about the material that was provided, 70% of tenants said they placed the supplied poster in a spot that was visible so that they could reference it in the future.

Audit Results

The results from the pilot study showed that there was a decrease in cross-contamination by a significant margin for the experimental buildings, whereas the control group had little to no change in the level of contamination. This was expected, as we did not implement any changes to the program in this group. However, the experimental group who received the grey carts and grey in-unit bins showed a clear decrease in contamination.
Having two distinctly different coloured recycling containers demonstrated a clear decrease in contamination. The audit results from the control group (blue cart-blue cart) and experimental group (grey cart-blue cart), show a 13% decrease in contamination in the experimental buildings (22% contamination in baseline audits and 9% contamination in the post-pilot audits,) while the control group showed no change. In the control group, the tenants were not exposed to grey carts, and did not know this pilot project was going on.

Feedback

Feedback was almost entirely positive during the pilot project with minimal resistance to the changes. The majority of tenants were very receptive and willing to talk when we visited. When asked what their level of satisfaction was, 88% of tenants stated they were satisfied, 10% were neither satisfied nor dissatisfied, and only 2% said they were dissatisfied with the changes. One concern noted by several tenants included the need for bigger bins.

Some of the comments we received include:

“Very satisfied - Keep up the good job!”

“Grey bins should be in every home!”

“Thanks for the information. It really helps.”
## Results / Evaluation

### Measurement of Success

<table>
<thead>
<tr>
<th>Goal / Objective</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>The major goal of the pilot was to educate tenants on proper recycling separation with the hopes of 10% contamination reduction by the end of the two month pilot.</td>
<td>After analysis of the recycling carts, the audits revealed that contamination was reduced by 13% in the experimental group.</td>
</tr>
<tr>
<td>Make recycling easier by creating a visual distinction between papers and containers recycling carts.</td>
<td>Based on survey results, 78% of tenants agreed that the grey carts and supplied material made recycling easier.</td>
</tr>
<tr>
<td>Educate tenants on how to properly sort their recycling.</td>
<td>We achieved a 90% success rate in communication with tenants directly to discuss proper recycling techniques. The remaining 10% were visited by their superintendent.</td>
</tr>
<tr>
<td>Maintain two-way contact with superintendents</td>
<td>We visited each superintendent in their building and provided contact information to maintain communication.</td>
</tr>
</tbody>
</table>
Program Improvements

With the small-scale pilot project completed and after gathering information from superintendent and tenants during surveys, in-person meetings, and phone calls, we have compiled a list of potential improvements for a larger scale roll out of this program:

- Provide larger bins
- Give tenants the choice between an in-unit recycling bin or bag
- Give buildings the opportunity to participate in this program upon request

Contamination Reduction in Other Municipalities

Other municipalities such as Niagara Region have already implemented measures such as grey carts as a means to reduce confusion between multiple waste streams. Contamination is a major issue in most municipalities and replicating this pilot project would be beneficial to potentially minimizing the issue.

The pilot was a low cost option and could easily be tested in other municipalities, both large and small. We were overwhelmed with the great feedback that we received from tenants and look forward to expanding the program to involve even more buildings!
Collateral Material

Results / Evaluation

Put Waste in the Right Place

2013 Garbage and Recycling Guide for Apartments

Introducing GREY Recycling Carts

Don’t bag your papers!

Grey Cart – Papers

Put Waste in the Right Place

BLue Cart (bottles, cans, cartons and jars)

Don’t bag your containers in grocery bags!