

Continuous Improvement Fund Project #315

## Tower Renewal Waste Diversion Phase 2

Final Report – May 2013

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### ABSTRACT

*Final report for the City of Toronto Tower Renewal Waste Diversion Phase 2: a Project to Conduct a Field Test of Strategies to Maximize Residential Waste Diversion in selected Tower Renewal Sites (RFP No. 9155-11-7082). This report covers the seven steps in the project: the selection of 10 field test buildings, stakeholder engagement, review of existing conditions, identification and review of strategic options, implementation & monitoring of strategies, post-implementation review and analysis and developing a waste diversion plan.*

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## Executive Summary

Phase 2 of the City of Toronto's Waste Diversion Project was a field test involving the implementation of waste diversion strategies at ten pre-1984 multi-unit residential buildings with the following goals: testing a diversity of waste diversion strategies, matching strategy success to building and demographic aspects and providing education to stakeholders engaged in the project.

A significant amount of information was collected including: observations of a range of approaches to waste management, responses from residents, statistical information on waste streams and information about the physical and demographic characteristics of the buildings.

Interesting findings include the following:

1. Waste diversion improvement is possible with time, commitment and a consistent approach.
  - All test locations increased the amount of waste in the waste stream (increased diversion)
  - The field test concluded within a relatively short time of implementation yet still achieved measurable performance results
  - All buildings had the potential for improvement by adopting low cost investments that had measurable outcomes
  - Management support, staff motivation and empowerment were critical to success
  - Waste diversion improvement was incremental with the adoption of new diversion strategies indicating that waste diversion enhancement should be a continuous process and not a one time event
2. Management and staff education as well as resident communication are critical to waste diversion improvement success.
  - Management and staff at all test locations benefited from the location waste management program assessment and information on the full suite of waste diversion strategies available for implementation
  - Management and staff education allowed for the selection of appropriate strategies to apply from a continuum of education tools, communication means and equipment/structural enhancements (in future, this could be facilitated by the use of the Tower Renewal STEP Program checklist, see Appendix J)
  - Communicating building waste diversion activities and performance to residents encouraged the adoption and participation in waste diversion activities
3. Changes in building ownership as well as management and staff turnover have a substantial and detrimental impact on performance; while structural changes and new residents provide opportunities for improvement.
  - Changes in ownership and management/staff created discontinuity that delayed the adoption of strategies, reduced adherence to guidelines and diminished performance
  - Actively managing change to maintain momentum of measures through documenting on-site procedures could improve outcomes
  - New residents provide an opportunity to engage and encourage waste diversion practices
  - Building structural changes, renovations and special projects provide an opportunity to enhance or adopt new waste diversion strategies

The selection of ten diverse buildings was critical to the success of the field test. The goal of the site selection process was to identify ten pre-1984 apartment buildings with geographic, structural and demographic diversity that would allow for the testing of a broad range of waste diversion strategies. The 10 locations selected for the field test were spread geographically in nine different City of Toronto Wards. Building size distribution was significant, both in the number of floors (from 8 to 27) and number of units (from 47 to 265). There were three locations that were considered “small” (less than 400 tenants); four locations were considered “average” (400-800 tenants); and three locations were considered large (greater than 800 tenants).

Employing the 2006 Canada Census tracts, each of the locations was categorized on four demographic parameters: education skills, language skills, percentage of immigration and visible minority and percentage of low-income earners. The notation was “high” if for that demographic statistic the location was above the range of the City average, Provincial average and location census tract average. It was “average” if it was within the range and “low” if the location was below the range. With the exception of education skills for which there were no “average” performers, there was representation of high, average and low for each of the other three demographic parameters.

Eight locations were privately held, five by large companies and three by small companies. Additionally, one condominium and one Toronto Community Housing Corporation (TCHC) building were selected. Half of the locations were owner managed and the other half were managed by third party property management companies.

Measuring waste diversion performance is an inexact science so a number of waste diversion performance indicators were utilized to improve the quality of the results of the field test. The three indicators used and their inherent errors include:

1. Percent of waste by weight in the waste stream:
  - sampling error.
2. Weight of waste generated per unit per day:
  - waste contamination in recycling containers is highly variable and may differentially affect waste generation rates,
  - the different demographics of the buildings and their different purchasing habits, and
  - the number of tenants per unit with family buildings generating more waste per unit than adult/senior buildings.
3. Waste diversion rate:
  - Waste contamination in recycling containers is highly variable and may affect waste diversion rates,
  - Seasonal/temporal variations in waste generation when weighing programs are conducted in different months. The field test weighing program was conducted as follows:
    - i. Pre-implementation waste weights November 2011
    - ii. Pre-implementation recyclable material weights February 2011
    - iii. Post-implementation waste, organic and recyclable weights October 2012 (one exception which had waste and recyclable material weighed February 2013 due to a delay in implementing the waste diversion strategy)

Assuming 100% of the recyclable material is in fact diverted (zero residue), the average pre-implementation diversion rate of the ten locations was 26%. The “corrected” waste diversion rate for the locations, assuming that 30% of the recyclable material is contaminated by waste, is 18%, and close to the City of Toronto’s stated 2011 waste diversion result for multi-unit residential of

20%. The pre-implementation waste diversion rates at the locations ranged from a low of 11% (corrected 8%) to a high of 51% (corrected 40%).

One location (Location 5) opted out of the program before any waste diversion strategies were implemented. This location remained in the field test and acted as the Control Location for the “change nothing” approach to waste diversion. This Control Location was useful for comparison purposes: locations whose waste diversion improvement exceeded the Control Location were identified as locations whose waste diversion strategies were successful.

There were few common characteristics among the locations that had the greatest pre-implementation waste diversion performance and even fewer still for those that had the lowest performance. This is potentially due to the sample size.

Testing a diverse array of waste diversion strategies revealed that cost and complexity lead owners and managers to make decisions to use low cost strategies with minimal to no impact on staffing. Only one location implemented a retrofit solution (chute closure) and one undertook a minor renovation to bring diversion programs inside the building. None of the locations elected to adopt a floor-to-floor recycling collection program utilizing chute rooms because of the staff investment needed to remove the recycling material from the chute rooms. The average cost of waste diversion strategy implementation was \$1,700 and required on average 5.6 staff hours on a one time basis. The average estimated ongoing operating cost of the waste diversion strategies employed was 0.17 staff hours (10 minutes) per week. The preliminary estimated operating savings of the waste diversion strategies was \$16 per week.

Though location teams were encouraged to contact each other during the field test and Facebook pages were created to assist location teams to engage and communicate with their tenants, neither of these communication strategies was utilized. During the course of the field test, communications between location teams and consultants were by telephone and email with each location having on average 8 or 9 site visits. These site visits included:

- Preliminary site visit to establish existing conditions and suitability for the field test
- Pre-implementation waste audit and site assessment
- Three to eleven waste diversion strategy implementation and monitoring site visits, and
- Post-implementation waste audit and site assessment

There was no correlation between waste diversion strategy success and the number of site visits as the three most improved locations as well as the three least successful locations having on average 8 visits.

Almost all the locations implemented a communication strategy using flyers and signage and utilized the substantial resources available at no cost from the City to update container stickers and signage as well as to distribute flyers to residents as part of their outreach program.

Outreach was particularly important at improving communications between staff and tenants. Building management indicated tenant education/communication is important to improving strategy outcomes. Seven of ten locations hosted events to roll out and educate tenants on the waste diversion program. The smallest location opted to go door-to-door to roll out and educate tenants. All eight locations reported improved tenant-staff communications. The only location that provided no outreach ranked 7 (of 10) in its waste diversion improvement.

Recyclable material was found to be the second largest material category of the waste stream at 9 of 10 locations: it made up anywhere from 11.42% (Location 2) to 33.52% (Location 6) by weight of the material in the audit samples. Further, organic waste was the single largest material

category of the waste stream at all 10 locations: it made up anywhere from 49.2% (Location 6) to 73.4%. This confirmed the diversion potential and demonstrated the need to develop and implement strategies that will enhance diversion programs at all locations

From pre-implementation to post-implementation, the average waste diversion rates at the locations increased from 26 to 28% (8% increase). Assuming 30% of the recyclable material is waste, the corrected waste diversion averages from pre- to post-implementation increased from 18% to 20% (10% increase). None of the locations achieved Target 70: the City of Toronto's stated waste diversion goal of 70%. The highest waste diversion rate post-implementation was 56%.

Table A below compares the weight of the waste stream and recyclable material stream before and after the project implementation.

Table A: Comparison of Garbage & Recycle Stream Pre and Post Implementation

	Waste Stream Pre and Post Implementation - annualized data: kg/unit/year <sup>1</sup>			Recyclable Material Pre and Post Implementation - annualized data: kg/unit/year		
Location Number	Pre	Post	% Change	Pre	Post	% Change <sup>2</sup>
4	613	504	-18%	77	128	67%
9	920	829	-10%	186	310	67%
10	639	628	-2%	102	150	46%
1	445	529	19%	164	179	9%
2	336	256	-24%	256	215	-16%
8	697	810	16%	106	84	-21%
3	580	599	3%	223	172	-23%
5 (Control)	551	427	-23%	193	128	-34%
7	179	157	-12%	157	95	-40%
6	296	493	67%	321	157	-51%
Average	526	523	2%	178	162	0%

<sup>1</sup> Waste audit data has been annualized based on waste audit data

<sup>2</sup> Ranked in order of the largest increase in the recycle stream

It is evident from Table A, that there were large changes in the waste and recycle stream. However there were few common aspects among the locations that had the best post-implementation waste diversion performance and even very few for those with the worst performance. An analysis of the post-implementation waste diversion performance against building, demographic, ownership/management and existing waste diversion programs suggests that, in the presence of support from waste management support specialists/consultants, that a combination or range of measures can be applied to achieve improved outcomes.

When assessed for the three waste diversion performance indicators, five locations (4, 9, 2, 10 & 7) demonstrated significant waste diversion performance improvement over the course of the field test and performed better than the Control Location that implemented no waste diversion strategy. The common aspects and waste diversion strategy elements of the locations with the most improved waste diversion performance during the field test include:

- Waste Diversion Strategy Launch: Buildings hosted events or featured door-to-door canvassing to implement waste diversion strategies and distributed flyers and updated signage.
- Waste Diversion Strategy Type: There was no single type of waste diversion strategy that led to better results, as the successful locations implemented a mix of recycling/organics facilitation/enhancement, organics implementation, increasing recycling capacity, and making waste disposal equally convenient to recycling (closing the garbage chute).
- Building Size: All three of the small buildings that participated in the field test demonstrated significant improvement in waste diversion performance and were in the most improved group.
- Demographic: There are no demographic aspects that are common to all five most improved locations.
- Ownership/Management: There are no ownership/management commonalities among the better performing buildings. There was a mix of owner managed and third party managed buildings in both the most improved and least improved groups.
- Length of Implementation: With the exception of one location that had implemented the waste diversion strategy for only 2 weeks, the other four locations in the most improved group had implemented the waste diversion strategies for 2 or more months. By comparison, the other less successful locations had implemented their strategies for less than one month. There was one marked exception to this as one location had implemented the strategy for 5 months yet experienced little to no improvement in waste diversion. The reason for the lack of success at this location is unknown particularly because the tenants and management believe waste diversion improved over the course of the field test.
- Cost of Implementation: The most improved group spent a little more on average \$2,220 as compared to all locations average \$1,700 in implementing the selected waste diversion strategies. Further, the most improved group spent a little more time, 8 hours on average as compared to all locations average of 5.8 hrs, in implementing the strategies.
- Economic Impact of implementation: In the most improved group, there were improved operational savings of 1.1 staff hours per week as compared to the locations average of 0.17 staff hours per week; but there were no financial savings in the most improved group as compared to the location average which was calculated to be a savings of \$16/week. It is likely that it is too soon after implementation for any economic impacts, particularly those associated with reduced waste collection service with the City, to be realized and captured in this report. The City should consider contacting the locations 12 months post-implementation to get a better measure of economic savings.

There is need for waste management training/support for decision makers at multi-unit residential buildings. 80% of the hosted educational Workshop participants would recommend an educational workshop to their peers and staff and management at four of ten locations felt better educated at the conclusion of the field test.

There is also a need for documented waste management practices and waste management training for multi-unit residential building staff to circumvent the knowledge loss caused by frequent staffing changes. Every location participating in the field test experienced staff, management or ownership changes during the course of the field test. This significant turnover in the staffing at multi-unit residential buildings makes it difficult to execute and maintain meaningful waste diversion improvements with lasting waste diversion success.

This report's recommendations are limited to the waste diversion strategies and supportive strategies that were implemented during this field test. These strategies were largely low cost



strategies that should be considered at the very beginning of establishing a waste diversion program at an older pre-1984 single-chute multi-unit residential building in the City of Toronto.

Recommendations identified through the field test experience include:

- 1) Resourced available through the City of Toronto Solid Waste Management website (available at <http://www.toronto.ca/garbage/multi/>) were found to be useful but some additions could be made to aid site implementation.  
Recommendation: Update the Waste Diversion Handbook to include templates for solid waste management procedures and training templates for multi-unit residential building staff to ensure easy transition during staffing changes.
- 2) City's 3Rs Ambassadors – Due to transient nature of participants it is very challenging to sustain participation and impact.  
Recommendation: Focus 3Rs Ambassador program on adults or consider creating an employment skills development focus for youth 3Rs Ambassadors to include specific training and credentials that could lead to employment opportunities with the City or in the community. For example, 3Rs Ambassadors may provide summer relief work supporting/training other multi-unit residential property staff in waste diversion projects.
- 3) Improve coordination of the City's Chute Closure Program – Departmental communications and overlap between Municipal Licensing and Solid Waste inspectors causes confusion and frustration due to delays.  
Recommendation: Suggest training a dedicated MLS inspector for waste management to oversee the chute closure program and other waste management "standards" matters.
- 4) Improve the City's Organics Program – With established organics program, large family buildings would benefit from additional/larger organics containers to capture more organics (Eg. Disposable diapers).  
Recommendation: Consider financing additional/larger in-suite organic containers for buildings with large-families.
- 5) Improve the City's Recycling Program – Once per week collection at buildings with limited space means many 6-yard containers are in use and these bins are too tall for many people to use. This can be a disincentive to participation and lead to the creation of litter.  
Recommendation: Consider increasing the collection service at these buildings to twice per week and incent the use of more accessible containers.
- 6) Provide Waste Diversion Workshops/Training events for multi-unit residential property managers and site superintendents.  
Recommendation: Roll-out a program of a series of half day workshops for multi-unit residential property managers and superintendents to cover topics such as: waste management best practices, documenting and updating waste management practices, developing waste diversion strategies; and implementing waste diversion strategies. This should include the use of an on-site manual to bridge the communication gap when new staff comes into a building. Distribution of case studies of successful initiatives, including a benchmark for all buildings, would motivate participation. The Tower Renewal STEP Program and benchmark can assist with this approach.
- 7) Establish a New City Front-line Support Program – Multi-unit residential property owners/managers and staff should be encouraged to make waste diversion changes and will require support, education and guidance in identifying and implementing strategies.

Recommendation: Provide waste management consulting services to older apartment buildings in the City. Divide city into geographic areas or divide buildings into types (low rise, high rise, condo) for waste management specialists. With 5,200 buildings assume 500 customers per inspector or ten inspectors for three years. The City may wish to selectively employ successful and experienced 3Rs Ambassadors to assist.

### *Acknowledgement:*

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## 1.0 INTRODUCTION

### 1.1 Overview of Tower Renewal Waste Diversion

Tower Renewal is a broad City of Toronto initiative which aims to rejuvenate Toronto's 1,189 multi-unit residential buildings that were built between 1945 and 1984 to achieve environmental, social, economic and cultural change.

The Tower Renewal Waste Diversion project is a three-phase project which aims to improve building waste diversion while improving environmental, economic and social performance. Phase 1 of this project was a feasibility study, analysis and plan for maximizing recycling material at pilot site buildings including cost and performance measures. This study was completed in 2010 and is available at:

[www.toronto.ca/city\\_manager/pdf/tr\\_waste\\_diversion.pdf](http://www.toronto.ca/city_manager/pdf/tr_waste_diversion.pdf)

This phase, Phase 2 of the project is a field test to maximize solid waste diversion at 10 locations, built on or before 1984 in the City of Toronto. The goals of the project include:

1. Test different waste diversion strategies and measure waste diversion gains;
2. Match waste diversion strategies to key building aspects (structural, demographic/community, management/ownership); and
3. Provide waste diversion education to the stakeholders in the communities of the Test site Buildings.

### 1.2 Overview of Toronto's Multi-Unit Residential Waste

The City of Toronto has over 5,000 multi-unit residential buildings of which more than 1,000 are older (pre-1984 construction) apartments with more than 8 floors. Historically, waste diversion rates in these buildings have lagged far behind the rates found in single-family dwellings and multi-unit residential buildings built to Modern standards.

In 2011 participation of the multi-unit residential building sector in the City of Toronto's diversion programs achieved a waste diversion rate of 20%. By comparison, single-family homes diverted 64% Under performance in the City of Toronto's recycling program and under participation in the City of Toronto's green bin organics program is the likely cause of these low diversion rates in multi-unit residential buildings. Improving waste diversion in the multi-unit residential sector is critical to the City achieving its stated 70% waste diversion goal.

The challenges establishing and improving waste diversion programs in multi-unit residential apartments include:

- Infrastructure & inconvenience – the convenience of the single garbage chute vs. the inconvenience of transporting recycling to designated recycling areas; and addressing access issues for seniors and those with mobility challenges
- Lack of Incentives – tenants don't directly see the cost or impacts of their disposal and recycling actions although the cost is embedded in their rent
- Demographics – providing waste diversion education in many languages
- Transient nature of tenants – educating new tenants on waste diversion programs

In July 2008 the City of Toronto introduced a Solid Waste Management volume based rate system (user pay) for both single family and multi-unit buildings. Under this program, multi-unit

residential buildings pay a fee based on the volume of garbage the building generates. This creates a financial incentive for multi-unit residential building owners to reduce waste. Under the program, the City's waste diversion collection programs are not subject to user fees. In order to receive city garbage collection, the buildings are expected to participate in one or more of the city's free waste diversion programs. City waste diversion programs that may be considered for implementation at a multi-unit residential building include:

- Recycling (Blue Bin)
- Organics (Green Bin) (New program: roll out to multi-unit residential sector is ongoing)
- E-Waste (New program: rolled out in 2010)
- HSW (Household Special Waste)
- Bulky/Furniture/Durable Goods
- White Goods/Metal

The City of Toronto also offers a waste diversion support program called the 3Rs Ambassador Program. It is a volunteer-driven waste diversion education and outreach program designed to help multi-unit residential buildings divert more of their waste. Under this program, residents volunteer in their own building to teach their neighbours about the 3Rs. The City of Toronto provides 3Rs Ambassador training, resources and support. Presently, there are approximately 174 3Rs Ambassadors representing 23,800 apartment units in the City of Toronto.

## 2.0 LOCATION SITE SELECTION

### 2.1 Site Selection Process

The goal of the site selection process was to identify ten buildings with geographic, structural and demographic diversity that would allow for the testing of a broad range of waste diversion strategies.

Stakeholders who took part in phase 1 feasibility study were contacted and asked if they had any buildings that would be interested in participating in this study. Also, large property owners and property managers were invited to identify buildings built prior to 1984 that were on City garbage collection for consideration. The Field Test project was also announced on the Ontario Multi-Residential Waste Diversion Forum (located at [www.linked.com](http://www.linked.com)) in May 2011.

Interested parties, whether they be property owners or managers, were asked to complete an initial questionnaire which included information relating to the building ownership/management structure, waste management practices, building structure and community. These questionnaires were used as a basis to select towers for a site visit. See Appendix A for a copy of the questionnaire.

Site visits were conducted to confirm information received in the questionnaires and to make an early determination as to whether waste diversion strategies that require certain structural elements be in place would be recommended and feasible. This was important to maximize the goal of testing a diverse array of waste diversion strategies.

In all, thirty towers were considered for the project. Questionnaires were received for twenty-two towers. From the twenty-two questionnaires, eighteen towers were selected for a site visit.

The property managers/owners of the final ten locations were asked to sign a Commitment Letter which described the Field Test Project, and defined roles and responsibilities. The signature demonstrated their willingness to participate in the project (see Appendix B for a copy of the Commitment Letter).

## 2.2 Geographic Diversity

The thirty towers considered for the project are represented in Figure 1. The Towers identified by dotted markers were not selected to participate in the Field Test project. The final ten locations are represented in clear markers in Figure 1. The addresses of the thirty towers considered and the ten selected locations are listed in Appendix C.

**Figure 1: Geographic Distribution of Towers Considered (dotted) and Included (clear) in the Field Test Project**



The ten locations selected for the field test are spread geographically around the City of Toronto and are in nine different City of Toronto Wards. The two locations in the same south-west ward (Locations 9 and 10; Ward 5) were selected as they represented buildings with structural elements and site-specific conditions that made them candidates for equipment retrofit waste diversion strategies that would not likely be recommended for testing in any of the other eight location buildings. Unfortunately neither location was able to implement the retrofit diversion strategies for which they were originally selected.

## 2.3 Structural Diversity & Waste Management Services

Location building size distribution was significant, both in the number of floors and number of units. The number of floors range from a low of 8 (Location 7) to a high of 27 (Location 4), number of units range from a low of 47 (Location 7) to a high of 265 (Location 6). Location 7 was the smallest building with the fewest floors and units.

All ten locations had garbage chutes and chute rooms. All garbage chutes were open and operational. Only one location (Location 7) did not compact waste but manually transferred waste from the chute into available containers.

Chute rooms represent potentially convenient locations for the collection of materials for diversion, however many chute rooms are of insufficient size or configuration to support collection or storage of materials. Each of the locations' chute rooms were classified according to whether their size and configuration would easily accommodate the collection and temporary storage of materials for diversion. Locations designated as "Good", would accommodate material collection/storage with no constraints; those designated "Moderate", would accommodate some material collection/storage with minor constraints; "Difficult" would accommodate a small amount of material collection/storage and "Not Feasible" would accommodate no material collection/storage. Of the ten locations, there was at least two of each chute room classification.

Recycling areas were generally located inside parking garages, basement utility areas, outside near rear exits, or in exterior parking garages. There were 6 locations with exclusively outdoor recycling areas; 3 with exclusively indoor recycling areas; and 1 location with both indoor and outdoor recycling areas.

There is relatively low, but growing, participation in both the City Organics and 3Rs Ambassador Program in the multi-unit residential buildings. Consequently it was not possible to select locations with a broad range of organics program implementation. According to City records, three of the locations were listed as being participants of the City's organics collection program (Locations 2, 3 & 6). However, only two had fully implemented the program (Location 2 & 3). Location 6 had launched the organic collection program in 2009 but the program was discontinued. In addition, one location (9) had purchased the organics collection container but was not listed as being on the City program nor had they implemented the program. None of the locations had a 3Rs Ambassador at the launch of this field test.



**Table 1: Structural Diversity and Waste Diversion Program Status**

Location Number	Number of Floors	Number of Units	Chute Room Space	Recycling room/area	Implemented City Organics program	City 3Rs Ambassador Program
1	14	164	Good	Outdoors	No	No
2	25	172	Moderate	Indoors & Outdoors	Yes	No
3	17	216	Good	Indoors	Yes	No
4	27	226	Not feasible	Outdoors	No	No
5	26	246	Difficult	Outdoors	No	No
6	25	265	Not feasible	Outdoors	No	No
7	8	47	Not feasible	Outdoors	No	No
8	18	234	Moderate	Indoors	No	No
9	14	128	Difficult	Indoors	No	No
10	8	77	Not feasible	Outdoors	No	No

## 2.4 Tower Community Diversity

In an effort to analyze the demographics of the locations selected for the field test, 2006 Census data was collected for each of the 10 locations. Knowledge of official language, percentage of new immigrants, percentage with no high school diploma/equivalent or higher education, percentage visible minority and percentage in low income (before tax) were analyzed and are presented in Tables 2 (a & b) below.

**Table 2a: Demographic Statistics of the Selected 10 Locations (Source: 2006 Census Tract Profile, Statistics Canada)**

Location Number	Language (% Knowledge Neither English or French)	Education (% over 15yrs no Certificate, Diploma or Degree)	% Immigrants	% Visible Minority	% in Low Income Before Tax
1	3.30%	25.66%	52.64%	47.14%	23.90%
2	3.51%	8.54%	57.70%	49.42%	19.80%
3	7.14%	4.77%	82.47%	79.20%	32.10%
4	3.06%	29.11%	53.06%	67.61%	47.10%
5	2.20%	24.59%	43.84%	33.05%	26.20%
6	3.30%	24.67%	67.20%	86.46%	49.10%
7	0.00%	6.10%	27.01%	10.49%	6.60%
8	6.58%	30.86%	62.00%	83.80%	39.20%
9	3.07%	13.68%	47.70%	27.50%	16.30%
10	1.90%	16.76%	44.27%	26.52%	9.50%
<b>Location Average</b>	<b>3.41%</b>	<b>18.47%</b>	<b>53.79%</b>	<b>51.12%</b>	<b>26.98%</b>
<b>Toronto Average</b>	<b>4.16%</b>	<b>19.73%</b>	<b>47.67%</b>	<b>42.86%</b>	<b>18.40%</b>
<b>Ontario Average</b>	<b>2.19%</b>	<b>22.24%</b>	<b>30.02%</b>	<b>22.82%</b>	<b>14.70%</b>

The demographic statistics were analyzed to identify significant outliers. Outliers were defined as any score that was not within the range of the location, Toronto and Ontario average scores for

that statistic. The immigration and visible minority scores were combined: the percentages were averaged and compared against the location, Toronto and Ontario average to identify outliers. The demographic descriptions wherein outliers are identified are presented in Table 2b, below.

**Table 2b: Demographic Description of the Communities of the 10 Locations (Source: 2006 Census Tract Profile, Statistics Canada)**

Location Number	Language Skills	Education Skills	Immigration & Visible Minority	% Low-Income
1	Average	Low	Average	Average
2	Average	High	High	Average
3	Low	High	High	High
4	Average	Low	High	High
5	Average	Low	Average	Average
6	Average	Low	High	High
7	High	High	Low	Low
8	Low	Low	High	High
9	Average	High	Average	Average
10	High	Low	Average	Low

With the exception of Education Skills for which there are no average performers, there is representation of high, average and low for each of the remaining three parameters: Language, Immigration and Visible Minority and Percent Low Income Earners.

Owners and property managers are an important component of tower communities. It was therefore important to ensure that the locations selected for participation represented a mix of ownership and management structure. Eight locations were privately held, of which five were large private companies and three small privately held companies. Additionally, one condominium and one Toronto Community Housing Corporation (TCHC) building were selected. Half the locations were owner managed and the other half were managed by third party property management companies. See Table 3 for details.

The building population estimates, obtained from property management, ranged in size from a low of 50 to a high of 1350 with representation at the low, average and high end of the scale. Three locations are small (less than 400); four locations are of average size (400-800); and three locations are large (greater than 800).

Tenant turnover and predominant family-type information was gathered from the property managers for each of the ten locations. Eight of the ten locations were identified as being family buildings (Locations 1,3,4,5,6,8,9, & 10). These locations had tenant turnover each month ranging from a high of 3.7% (Location 3) to a low of 0.4% (Location 8). Location 2 identified as a



senior building had a low tenant turnover of 0.6%; while Location 7 an adult building had an average tenant turnover of 2.1%.

**Table 3: Location Community Information and Description**

Location Number	Owner-ship	Management	Building Population (total tenants)	Tenant Turnover (% units per month)	Tenant Family Type
1	Large Private	Owner Managed	574	1.5%	Mix of all family types
2	Condo	3 <sup>rd</sup> Party Managed	200	0.6%	Seniors, Singles. Few families.
3	Large Private	3 <sup>rd</sup> Party Managed	600	3.7%	Families
4	Large Private	3 <sup>rd</sup> Party Managed	1350	3.8%	Families
5	Small Private	3 <sup>rd</sup> Party Managed	900	2.4%	Families, single mothers
6	Small Private	3 <sup>rd</sup> Party Managed	678	1.9%	Single mother family/students
7	Large Private	Owner Managed	50	2.1%	Predominantly adult
8	Large Private	Owner Managed	936	0.4%	Single mother families
9	TCHC	Owner Managed	640	2.0%	Families with children
10	Large Private	Owner Managed	385	1.3%	Families

In summary, the locations selected had a range of community types as represented in Table 4 below.

**Table 4: Location Community Diversity**

Location Number	Owner / Manager	Building Population Size	Tenant Turn-over	Language & Education Skills	Immigration & Visible Minority	% Low-Income	Family type
1	Private Owner Managed	Average	Low	Average Language Low Education	Average	Average	Family
2	Condo 3rd Party Managed	Small	Low	Average Language High Education	Average	Average	Senior, families moving in
3	Private 3rd Party Managed	Average	High	Low Language High Education	High	High low-income	Family
4	Private 3rd Party Managed	Large	High	Average Language Low Education	High	High Low-Income	Family
5	Private 3rd Party Managed	Large	Average	Average Language Low Education	Average	Average	Family
6	Private 3rd Party Managed	Average	Low	Average Language Low Education	High	High Low-Income	Family
7	Private Owner Managed	Small	Average	High Language High Education	Low	Low Low-Income	Adult
8	Private Owner Managed	Large	Low	Low Language Low Education	High	High Low-Income	Family
9	TCHC Owner Managed	Average	Average	Average Language High Education	Average	Average	Family
10	Private Owner Managed	Small	Low	High Language Low Education	Average	Low Low-Income	Family

## 2.5 Strategic Opportunity

Locations 9 and 10 were selected because they both represented an opportunity to test solutions that would not be recommended for implementation at any of the other eight locations. Location 9 had structural conditions making it a possible candidate for a retrofit strategy “external chute system”; while Location 10 had an odour issue making it a possible candidate for the implementation of a novel new collection solution “in-sink garburator for organics”. They were therefore included in the project in spite of their geographic proximity and demographic similarity. Unfortunately neither location was successful in implementing the waste diversion solution for which they had been selected (see section 5.2 for discussion).

## 3.0 LOCATION TEAMS

### 3.1 Education and Outreach (Workshop)

Location Teams were created from the persons identified by the Property Owner/Manager in the Commitment Letters. Location Team contact information included telephone numbers and, in most cases, email addresses. Wherever possible, tenant representation on the Location Team, whether it be an on-site resident Site Manager or tenant representative, was solicited. Location Team membership initially consisted of 4 locations having Property Manager and Site Manager teams; 4 locations with Building Manager, Site Manager and Recycling Coordinator team members: 1 with Property Manager, Site Manager and two newly trained 3Rs Ambassadors on the team; and 1 with Property Manager, Superintendant and a vacancy in the Site Manager role.

The Location Team members were all invited to participate in a Workshop September 28, 2011 at the Scarborough Civic Centre from 8am to 11am (see Appendix D for workshop slides). Sixteen (16) Location Team members representing nine (9) of the locations participated in the Workshop. Location Team 9 had another engagement the day of the Workshop. Location Team 9 was provided with electronic copies of the Workshop material and had an individually tailored Workshop on October 21, 2011 in their building.

The Tower Renewal Waste Diversion Workshop was largely educational in format and covered a full range of waste diversion strategies, including diversion program strategies and supportive strategies. There were presentations from both the City of Toronto Solid Waste and 3Rs Ambassador Coordinator as well as one from a waste management equipment supplier.

An on-line survey following the Workshop revealed the following responses to questions (there were 5 of a possible 16 respondents):

1. Workshop Content: 80% said the Workshop covered all of the information well and 20% said it covered most of the information well
2. Practical Information: 60% said the Workshop provided them with practical waste diversion information that they could use to improve waste diversion at their Location Building. 20% said they could probably use the information to improve waste diversion. 20% said there was no information that they could use.
3. Additional Topics: Additional topics they would like to have had covered: how to engage tenants and break tenant's bad habits; cost savings details; more detail in general.
4. Team Building within Location Teams: 60% said the Workshop provided a forum for team building within the Location Teams. 40% said the organizers were not successful in this regard.
5. Team Building between Location Teams: 40% said the Workshop provided a forum for team building within the Location Teams. 40% said the organizers were somewhat successful in this regard. 20% said the Workshop was unsuccessful in this regard.
6. Comment on how to improve Team Building: Only one comment regarding how to improve team building: "We should have all agreed to providing one another with our emails to stay connected".
7. Workshop Recommendation: 80% said that if this Waste Diversion Workshop were offered again, they would recommend this Workshop to their peers/stakeholders; while 20% said they would not recommend this Workshop.

## 3.2 Communications

Location Facebook pages were created for use by the Location Teams to communicate between Teams, within Teams and within their location communities. These “Community” Facebook pages were all entitled: “Waste Diversion at {location street name}.” The pages were initially used to communicate waste audit findings. It was thought these pages could have been used by the Location Teams to communicate waste diversion strategy selection and implementation as well as to obtain feedback from tenants. They could also have been used to ask and answer questions from other Location Teams and track other Location Teams progress.

In November 2011 a Location Team email distribution list was distributed to the Location Team members and included in the distribution list was the link to each of the Location Waste Diversion Facebook pages. This communication was intended to interconnect the Location Teams so that could support each other and monitor location progress during the field test. There was very little activity on the Facebook pages or between Location Teams throughout the project.

Communications between Location Teams and the consultants were by telephone and email with each location having on average 8 or 9 site visits. These site visits included:

- Preliminary site visit to establish existing conditions and suitability for the field test
- Pre-implementation waste audit and site assessment
- Three to eleven waste diversion strategy implementation and monitoring site visits, and
- Post-implementation waste audit and site assessment

There was no correlation between waste diversion strategy success and the number of site visits as the three most successful locations and the least successful locations had on average 8.3 visits.

## 4.0 PRE-IMPLEMENTATION

### 4.1 Pre-Implementation Waste Audit

Once the locations were selected and committed to the project, pre-implementation waste audits were conducted to determine the characteristics of the waste being disposed at the buildings. The audits followed the protocol outlined in Canadian Council of Ministers of the Environment's "Recommended Waste Characterization Methodology" for onsite generator-based audit (Section 4 – Study Design) with the exception of the sample size. Due to the 'random nature' of materials dropped down a chute/into a container by a population in a multi-unit residential building, and based on expert guidance from persons with experience in waste composition studies within the multi-unit residential sector, the sample sizes were limited to 1 cubic yard. These samples were deemed representative based upon standard industry practice of randomizing the waste visibly to ensure bags included in the sample come from a variety of units.

The auditor obtained a sample from the waste material that had been deposited into either the chute intake or open top non-compacted waste receptacles at each of the locations. In order to obtain a representative sample from each location, the sample accumulation date was selected to reflect typical daily resident practices, routines and building services. The waste was also randomized visibly to ensure bags included in the sample came from different units. The audit sample was not collected during special events or holidays, cleanups or renovations. Only the waste streams were sampled.

Materials were sorted into specific categories and weighed with a digital scale. For definitions of specific waste categories, see Appendix E. These specific waste categories were created prior to the waste audit but additional categories were added at the time of the audit to guarantee that materials observed in significant quantities could be considered for potential diversion programs. Specific waste category tables for each of the 10 locations appear in Appendix F. The specific categories were then grouped into one of the following material categories based on the acceptance criteria in the City of Toronto waste diversion programs as well as items suitable for charitable donation collection:

- Organics
- Recyclable Material
- E-waste, Household Special Waste (HSW)
- Donateable Material
- Waste

The locations waste diversion is measured by percentage by weight of non-waste material entering the waste stream: a location with high non-waste in the waste stream has poor diversion. Further, the material category of the non-waste with a high value gives an indication of which diversion program is failing and/or warranted at a given location. For example, a location with a high amount of organics in the waste stream would benefit from a diversion strategy addressing organics. The pre-implementation waste audit results showing percentage composition by weight of the waste stream by material category are presented in summary format below (Table 5). The location with the highest percentage of waste in the waste stream (Location 2) is the location with the best diversion program (i.e., their residual waste has a high proportion of waste and contains a lower proportion of divertible materials); while the location with the lowest percentage of waste in the waste stream (Location 9) is the location with the worst diversion program (i.e., a high percentage of divertible non-waste in the waste stream).

Organic waste was the single largest material category of the waste stream at all 10 locations: it made up anywhere from 49.2% (Location 6) to 73.4% (Location 1) by weight of the material in the audit samples. Locations 2 and 3 had implemented the City of Toronto organics collection program yet only Locations 3 and 6 had significantly less than the average organics by weight in the waste. However on further inspection, Location 2 had a low amount of recyclable material in the waste stream thereby making the relative proportion of organic waste appear high. The converse held for Location 6, which had a very high amount of recyclable material in the waste stream, which made the relative proportion of organic waste appear low.

Recyclable material was the second largest material category of the waste stream at 9 of 10 locations: it made up anywhere from 11.42% (Location 2) to 33.52% (Location 6) by weight of the material in the audit samples. This demonstrated the need to develop and implement waste diversion strategies that will enhance recycling programs at all locations, particularly the under performing ones.

Waste was the third largest material category of the residual waste stream at 9 of 10 locations: it made up anywhere from 4.44% (Location 4) to 25.71% (Location 2) by weight of the material in the waste audit sample. In locations with high performing diversion programs, waste should comprise a high proportion of the waste stream.

Location 2 was the only building that had more waste than recyclable material in the waste stream indicative of a building with a relatively successful recycling program.

**Table 5: Location Pre-Implementation Waste Audit Waste Stream Composition by weight**

Location Number	Organics	Recyclable	E-Waste, HSW	Donatable	Waste
1	73.40%	16.10%	0.30%	1.80%	8.40%
2	60.07%	11.42%	0.04%	2.76%	25.71%
3	50.04%	27.55%	0.17%	4.92%	17.31%
4	70.66%	21.43%	0.43%	3.04%	4.44%
5	64.69%	24.37%	0.00%	1.21%	9.72%
6	49.20%	33.52%	6.21%	0.00%	11.07%
7	62.10%	21.20%	0.00%	3.15%	13.58%
8	63.97%	25.45%	0.05%	2.24%	8.28%
9	57.40%	31.39%	2.05%	1.00%	8.17%
10	59.03%	16.62%	1.06%	8.14%	15.15%
Maximum	73.4% (L 1)	33.52% (L 6)	6.21% (L 6)	8.14% (L 10)	25.71% (L 2)
Minimum	49.2% (L 6)	11.42% (L 2)	0% (L 5,7)	0% (L 6)	4.44% (L 4)
Average	61.06%	22.91%	1.03%	2.83%	12.18%

## 4.2 Pre-Implementation Waste Generation Rates & Waste Diversion Performance

In order to obtain accurate waste generation and diversion information and to accurately measure the success of the waste diversion strategies at the locations, the City of Toronto undertook a waste and recyclable material weighing program at nine of the ten locations. Location 7 is on a roll-cart service and this location's waste and recyclable material was weighed manually using a

digital scale. This weighing program was repeated again for waste, recyclable material and organics at the conclusion of the field test (see Section 6.2).

In all cases, the location waste was weighed at the first collection day of the week and not following a long weekend. Waste was from a period that included 4 days generation: 2 weekdays and 2 weekend days. Location 7 was on roll-cart collection and waste generation at this building was weighed using a digital scale and included both a weekend and weekday in the accumulation period.

With the exception of Locations 7, 9 and 10, the location recyclable material was weighed after 6-7 days accumulation. Locations 7, 9 and 10 recyclable material accumulation included only 2-3 days. Again, Location 7 was on roll-cart collection so recyclable material generation at this building was weighed using a digital scale and included both a weekend and weekday in the accumulation period. Table 6 shows the waste and recyclable material generation rates expressed as kilograms generated per unit per day for the 10 locations.

Waste was weighed November 7 and 8, 2011. The recyclable material was weighed January 31 to February 9, 2012.

The City of Toronto organic waste collection program was implemented at Locations 2 and 3 prior to the commencement of the field test, however this material was not weighed pre-implementation at either of the locations. The pre-implementation organic waste was therefore estimated in accordance with the following:

- 1) Location 2 implemented a waste diversion strategy that should reduce the organic waste in the waste stream and further there was a 20% reduction in organic waste by weight in the waste stream from pre- to post-implementation (Section 6.1). Using the 20% reduction in organic waste in the waste stream and the post-implementation organic waste weight of 0.3 kg/unit/day the pre-implementation organic waste weight was estimated to be 0.25 kg/unit/day.
- 2) Location 3 implemented a waste diversion strategy that should not reduce the organic waste in the waste stream and further there was even a slight increase in organic from pre- to post-implementation. Therefore Location 3's organic weights were assumed to be the same pre-implementation as post-implementation.

Location 6 had a notably "contaminated" recycling container at the pre-implementation waste audit and, judging by the behaviour of residents and in conversation with site staff, the recycling container was being used for the disposal of any material (waste or other) that would not fit down the garbage chute. Consequently the pre-implementation waste generation rate, waste diversion rate and waste diversion performance ranking for Location 6 are likely over-stated and are excluded from the location average calculation in Table 6 below.

**Table 6: Pre-Implementation Waste and Recyclable Material Generation Rates**

Location Number	Pre-Implementation Waste Gen (kg/unit/d)	Pre-Implementation Recycle Gen (kg/unit/d)	Pre-Implementation Organics Gen (kg/unit/d)	Pre-Implementation Diversion Rate
1	1.22	0.45	0.00	27%
2	0.92	0.70	<b>0.25 e</b>	51%
3	1.59	0.61	<b>0.13 e</b>	33%
4	1.68	0.21	0.00	11%
5	1.51	0.53	0.00	26%
6	0.81	0.88	0.00	52%
7	0.49	0.43	0.00	47%
8	1.91	0.29	0.00	13%
9	2.52	0.51	0.00	17%
10	1.75	0.28	0.00	14%
Location Average	<b>1.51*</b>	<b>0.45*</b>	<b>0.19**</b>	<b>26%*</b>
Corrected Average	<b>1.64*</b>	<b>0.32*</b>	<b>0.04*</b>	<b>18%*</b>

*e – estimated weight, not weighed*

*\* averages exclude Location 6 due to significant waste contamination in the recycling stream*

*\*\* average includes only those locations with organics collection programs (2 and 3)*

It is important to note that the recyclable material weight and the waste diversion rates assume 100% of the material placed in the recycling containers for collection is diverted from disposal. Based on industry accepted estimates, it is likely that upwards of 30% of the material is waste contamination and removed from the recyclable material for disposal at the receiver recycling site. Further, the level of contamination will be building specific and be related to the relative ease of access to the various waste and recycling material collection points in each of the buildings. However, for the purpose of this study, recyclable material will be assumed to be 100% recycled at all locations but for comparison purposes, the 26.37% corrected for a 30% contamination rate in the recyclable material provides for an average 18.00% pre-implementation waste diversion rate at the nine locations. This average is lower than but comparable to the 2011 City of Toronto estimate of waste diversion rates at multi-unit residential buildings of 20%.

### 4.3 Pre-Implementation Waste Diversion Performance

Waste diversion performance was measured prior to waste diversion strategy implementation and again after implementation using three waste diversion performance indicators:

1. Waste as a relative proportion by weight of material in the waste stream (from waste audit, see Section 4.1)
2. Waste generation rate as kilograms of waste generated per unit per day
3. Waste diversion rate: the percentage by weight of material being diverted as a percentage of total waste, recyclable material and organics generated



Waste generation rate as kilograms of waste generated per person/tenant per day was not included in the final analysis as the divergent family groupings at each the locations caused this rate to vary so widely as not to be considered useful.

The success of the waste diversion strategies was determined by measuring the net change in the three waste diversion performance indicators for each of the 10 locations at the completion of field-testing the waste diversion strategies (Section 7).

The three waste diversion performance indicators for each of the 10 locations and the location waste diversion ranking appear in Table 7. The 10 locations were ranked against each other for each of the three parameters. For each of the 10 locations, the average of the three ranks were then calculated and the 10 Locations Overall Waste Diversion Performance Rank was determined. Due to the high contamination of waste in the recycling container at Location 6 skewing the Waste Generation (kg/unit/day) and Waste Diversion Rate, this location has an over-stated pre-implementation waste diversion performance rank. Table 7 indicates that Locations 2, 6 and 7 have the best diversion programs (Average Rank <3.0); Locations 1, 3, 5 and 10 modest programs (3.0<Average Rank<8.5); and Locations 4, 8 and 9 (Average Rank>8.6) the poorest operating programs prior to field testing the waste diversion strategies.

**Table 7: Pre-Implementation Waste Diversion Performance Ranking**

Location Number	% Waste by Weight in Waste Stream	% Waste Rank	Waste Gen (kg/unit/d)	Waste Gen kg/unit/d Rank	Waste Diversion Rate	Waste Diversion Rate Rank	Average Rank (3 Indicators)	Overall Waste Diversion Rank	Pre-Implementation Waste Diversion Performance
1	8.40%	7	1.22	4	27.08%	5	5.3	5	Modest
2	25.71%	1	0.92	3	50.59%	2	2.0	1	Good
3	17.31%	2	1.59	6	31.64%	4	4.0	4	Modest
4	4.44%	10	1.68	7	11.33%	10	9.0	10	Poor
5	9.72%	6	1.51	5	25.87%	6	5.7	6	Modest
6	11.07%	5	0.81	2*	51.99%	1*	2.7*	2*	Good*
7	13.58%	4	0.49	1	46.82%	3	2.7	2	Good
8	8.28%	8	1.91	9	13.29%	9	8.7	8	Poor
9	8.17%	9	2.52	10	16.77%	7	8.7	8	Poor
10	15.15%	3	1.75	8	13.64%	8	6.3	7	Modest

\*Waste diversion ranking overstated as recycling container had significant contamination

Location 6 had significant contamination in the recycling container and this would have artificially lowered the waste generation rate and increased the waste diversion rate. Therefore, for the purpose of determining aspects that are common to buildings with good waste diversion performance, this location is not considered to have a “good” pre-implementation waste diversion performance.

Some aspects of Locations 2 and 7, the top two waste diversion performing buildings, pre-implementation were:

1. Building: both Locations 2 and 7 are small, however the other small building (Location 10) only performed modestly well in comparison.
2. Demographic: Locations 2 and 7 are the only buildings identified as being occupied largely by adults/seniors, and not by families. Locations 2 and 7 both have tenants with “high” education skills, but so do other buildings.
3. Ownership/Management: Location 2 is a condominium and 7 is owned by a large private company and is owner managed.
4. Waste Diversion Programs Already in Place: Location 2 had implemented the City Organics program but Location 7 had not.

Locations 4, 8 and 9 had the worst waste diversion performance pre-implementation. There were no obvious common aspects that these locations shared that were not also shared by other locations. These are average to large sized buildings, with three unique ownership/management structures, family-buildings with tenants of mixed demographics (see Location Summary Tables, Appendix I). None of these three locations had implemented the City Organics or 3Rs Ambassadors, but neither had five of the other locations that had better pre-implementation waste diversion performance.

These findings suggests that building characteristics and resident demographics can not be reliably used to indicate propensity for waste diversion success. Success is more likely indicated by how the building is managed and residents are engaged, particularly over a period of time. .

## 5.0 WASTE DIVERSION STRATEGIES

### 5.1 Develop and Agree Upon Waste Diversion Strategy Recommendations

Between October and December 2011, waste diversion strategy recommendations were presented to the Location Teams. These communications included a summary of all the waste diversion strategies considered, the scoring of each of the strategies and a summary recommendation. Cost estimates for waste diversion strategies were provided where applicable. Costs for strategy implementation were borne exclusively by the location owner/manager. A copy of the detailed Waste Diversion Strategy Recommendation for each of the locations appears in Appendix G.

A brief description of each of the waste diversion strategies that were considered for implementation is provided in Appendix H. A summary table showing the waste diversion strategies that were recommended to each of the locations appears in Table 8. For additional information regarding waste diversion strategies, the reader is directed to Sections 5.1 and 7.2 of the 2010 Phase 1 Tower Renewal Waste Diversion Report which is available at: [www.toronto.ca/city\\_manager/pdf/tr\\_waste\\_diversion.pdf](http://www.toronto.ca/city_manager/pdf/tr_waste_diversion.pdf)

### 5.2 Waste Diversion Strategy Implementation and Monitoring

There were many changes to the waste diversion strategy mix at each location from time of recommendation to implementation indicating that there were many viable alternatives at each location. It was the balance of available staffing, available equipment, costs and effort that were important in deciding upon the final waste diversion strategy mix for implementation.

From the time between deciding upon a waste diversion strategy to actually implementing those selected strategies, it was management support and staff motivation and empowerment that were critical to success. Waste management ranks low on the list of priorities at these locations and there was significant turnover in staffing and property management at the locations (see Section 7.5 & Location Summary Tables Appendix I).

In December 2011, a new property management company took over responsibility at Location 5. The new property management company felt unable to implement waste diversion strategies at that time but did agree to remain part of the project and participate in the post-implementation waste audit and waste-weighting program. As such, this location acted as a “Control” Location for the “change-nothing” waste diversion strategy.

For each location, the list of waste diversion strategies recommended for implementation (R), rejected from consideration (X), attempted but failed implementation (F), and fully implemented (I) appears in Table 8. The waste diversion strategies implemented at each of the locations appear in the individual Location Summary Tables (Appendix I) and a discussion of the strategies grouped by strategy type appears below.

### New Collection Solutions

City Organics, a program offered at no charge by the City of Toronto was implemented at Locations 1 and 4. Location 6 was actively implementing this strategy though it was not fully implemented by the conclusion of the field test. This strategy involved the distribution of in-suite organic totes and educational material to tenants, purchasing a large organic waste container and finding a location for the organic waste container. The in-suite organic totes, flyers and educational material, and the collection service are offered by the City at no charge to the buildings. The buildings are responsible for purchasing/locating a large organic container at their cost.

E-Waste, a program offered at no charge by the City of Toronto, was implemented only at Location 10.

The novel collection solution “In-sink organics” failed at Location 10 as there were financial concerns as well as structural concerns associated with the installation of garburators in each unit.

Overall, new collection solutions tend to require more time to develop and implement due to capital budget planning and investigation of implications of regulations or structural constraints.

### Retrofit

The only retrofit solution that was fully implemented was the creation of an indoor recycling area at Location 9. This location renovated a basement area and provided an indoor area for the drop off of recyclable material and organics. However the organics bin was too large and created odour issues so the organics container was removed from service pending the receipt of a smaller container. At the conclusion of the field test, the organics program was “on hold” and not implemented at this location.

Location 3 had undergone some renovations to create an indoor recycling area during the field test but had abandoned it mid-way when there was a change in management.

The installation of an external chute at Location 9 failed for both cost and structural reasons.

Similar to new collection solutions, retrofit measures pose complexities and potential limitations due to capital budget planning and investigation of implications of regulations or structural constraints.

### Operational Adjustments

Location 7, a low-rise with only 8 floors, closed the garbage chute. The process was lengthy as it required obtaining approval from the City Solid Waste Management and this included:

- 1) Polling the tenants to have signatures of support from 51% or more units,
- 2) Completing an application and supporting documentation (implementation plan and communication plan) to the City Solid Waste Department,
- 3) Having two City of Toronto inspections: from Solid Waste Management Services and Municipal Licensing Services,
- 4) Waiting for recommendation from the two inspections,
- 5) Implementing recommendations from the inspections (installing an enclosure), and
- 6) Final City of Toronto inspection and sign-off.

Of all strategies implemented, this one required the most significant management and staff motivation and effort as steps 1 through 4 of the process took 8 months. Not surprisingly this was the final waste diversion strategy to be implemented.

Container optimization was implemented at 6 of the Locations (2, 4, 6, 8, 9 and 10). This was a relatively easy, low-cost solution as it involved either changing recycling container size (usually increasing capacity) and/or bringing recycling/organics container inside for ease of access. Recycling capacity was increased at Locations 4, 8 and 10; and the organics/recycling containers were brought inside at Locations 2 (organics), 6 (recycling) and 9 (recycling).

Location 6's container optimization strategy was designed to both decrease waste contamination in the recycling stream while increasing recycling participation. At the pre-implementation waste audit, Location 6 had been identified as a building with significant contamination in the recycling containers (see section 4.2). The strategy implemented involved providing for inside recycling in the move-in room while locking the outside recycling enclosure to prevent the dumping of waste, particularly oversized waste, in the recycling containers. Unfortunately both waste and recycling were found to be deposited in this area, creating additional cleaning work for staff. This strategy, if to be successful, will require additional resident engagement supports such as: additional signage, flyers, and perhaps even another hosted Event.

Overall, the operational adjustments proved to enjoy significant uptake.

#### Financial Tools and Incentives

Five locations were identified for implementation of a financial tool/incentive waste diversion strategy. Two locations rejected this strategy (1 and 4); three locations attempted a strategy (Locations 6 and 9); and one (Location 8) implemented a strategy but only after significant delay.

The Recycle Bank option, that involved the installation of a reverse-vending machine for recyclable material and was recommended at Location 6 and 9, failed because the potential supplier had difficulty in guaranteeing continuity of their incentives for the term of the field test.

The tenant incentive strategy implemented at Location 8 involves the issuing of tickets to tenants for all recycling bags deposited in the recycling container, the matched ticket is put in for a monthly draw. The winner of the "best recycler" for the month is awarded a \$50 gift card to a local retail/establishment. There was significant delay in implementing this strategy largely caused by:

- 1) Management discussions surrounding financing the reward program, and
- 2) Lack of staff empowerment in implementing the program.

However, after much delay, this program has surprised site staff and management in its ability to motivate tenants who state there is a marked increase in recycling at the location even though it had only been implemented for two weeks prior to the conclusion of the field test.

Innovative tools such as these are generally met with reluctance due to risk aversion of the unknown. Further development of test cases could be beneficial in generating greater ease with employing more innovative approaches.

#### Outreach

These strategies received much management support and were implemented and/or implementation was attempted at all 9 locations (Location 5 was the "Control" and did not consider or implement any waste diversion strategies).

Events were used to introduce new waste diversion programs at 7 of 9 locations. Location 7 was the smallest building and chose to go door-to-door to educate tenants. Location 3 did not host an event nor go door-to-door.

3 Rs Ambassadors were recommended at 8 locations, rejected at 3, attempted at 5 and fully implemented only at 2 (Locations 1 & 2), though the Ambassadors were not active at the conclusion of the field test. Five locations used City supplied flyers to recruit 3Rs Ambassadors though only two locations were successful. The two locations that did successfully implement the 3Rs Ambassadors program reported:

- Location 1: 1 teenage volunteer was trained, performed 20 hours work educating tenants door-to-door but was no longer active at the conclusion of the field test.
- Location 2: 3 teenage volunteers were trained and they hosted the Event to launch the waste diversion strategy but that none of them were active at the conclusion of the field test.

It would appear that although 3Rs Ambassadors can contribute to improving waste diversion by assisting in the implementation of new waste diversion strategies (or other event-based activities), that there is a high turnover in this position in family buildings, requiring potentially frequent recruitment events and City training. 3Rs Ambassadors participating in the field test were all teenagers who used the training and activities towards their mandatory 40 hours of volunteer work required of City of Toronto high school graduates. A program that was more comprehensive in its training/support could be more successful in maintaining participation.

#### Communications

Flyers and signage were embraced at all nine locations (Location 5 was Control Location). Locations took advantage of the free flyers, signage and stickers offered by the City of Toronto. Signage and stickers were used to identify waste/recycling/organics receptacles, posters to identify materials for inclusion in each container and flyers were distributed door-to-door or at Events.

Use of Facebook to engage the tenants was rejected at all locations.

Table 8: Waste Diversion Strategy Recommendation & Implementation Summary Table (pg 1 of 2)											
STRATEGY TYPE	STRATEGY NAME	1	2	3	4	5	6	7	8	9	10
<b>New Collection Solutions</b>											
	City Organics	R I	in place	In place	R I					R F	
	City E-Waste	in place	in place				R X				I
	Charitable/Donatable Program	in place	in place	In place							
	Other: in-sink organics										R * F
<b>Retrofit</b>											
	Bi- or Tri-Sorter			R X							
	Divided Chute										
	External Chute					R X				R* F	
	Other: Create Indoor Recycling/Organics Area			R F						R I	
<b>Operational Adjustments</b>											
	Temporary Chute Closure							R X			
	Permanent Chute Closure							R I			
	Door-to-Door Collection		R (Ewaste, HSW, Don) X					R	R X	R X	
	Floor-to-Floor Collection		R (Org, Recycl) X	R X		R X					R (Recycl) X
	Designated Chute Times							R X			
	Compactor Optimization										
	Container Optimization (change &/or relocate containers)		I	R F	R I	R X	R I		R I	R I	R I

R = Recommended for implementation as part of the field test project

I = Fully Implemented as part of the field test project

F = Management accepted the recommendation but Failed to fully implement prior to the end of the field test project

X = Management rejected the recommendation and there was no attempt at implementation

\* = Not appearing as recommended in waste diversion strategy recommendation (Appendix G) as it was recommended and failed prior to making the written recommendation or recommended after making the written recommendation

Table 8: Waste Diversion Strategy Recommendation & Implementation Summary Table (pg 2 of 2)											
STRATEGY TYPE	STRATEGY NAME	1	2	3	4	5	6	7	8	9	10
<b>Financial Tools and Incentives</b>											
	Tenant Incentives						R X		I		
	Building/Community Rewards								R X	R X	
	Staff Incentives	R X			R X				R X		
	Recycle Bank						R* F			R* F	
<b>Outreach</b>											
	3Rs Ambassador Program	R I	R I	R F	R F	R X	R F		R X	R X	
	Third Party Community Groups								R X		
	Events	I	I		I		I	R I	R I	I	R I
	Pledges							R X			R X
<b>Communications</b>											
	Facebook Site – Engaging Tenants	R X	R X	R X	R X	R X	R X	R F	R X	R X	R X
	Flyers/Signage	R I	R I	I	R I	R X	R I	I	R I	I	R I

R = Recommended for implementation as part of the field test project

I = Fully Implemented as part of the field test project

F = Management accepted the recommendation but Failed to fully implement prior to the end of the field test project

X = Management rejected the recommendation and there was no attempt at implementation

\* = Not appearing as recommended in waste diversion strategy recommendation (Appendix G) as it was recommended and failed prior to making the written recommendation or recommended after making the written recommendation



## 6.0 POST-IMPLEMENTATION

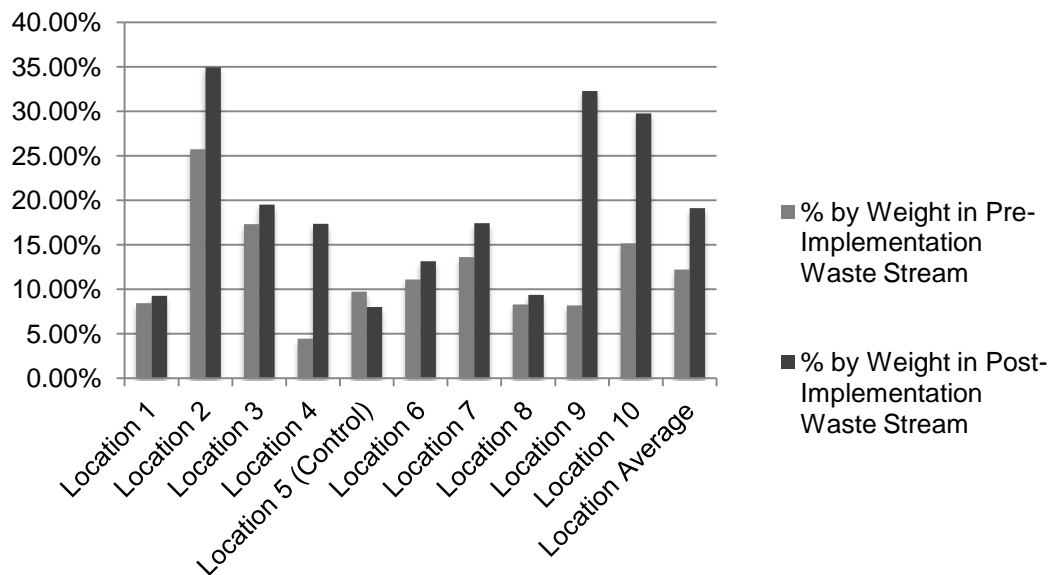
### 6.1 Post-Implementation Waste Audit

Post-implementation waste audits were conducted at 9 of the locations between October and December 2012 and the locations with only recently implemented waste diversion strategies were scheduled for the latter part of that time period. Location 7 experienced significant delays in implementing the garbage chute closure strategy, so this waste audit was delayed to February 2013 when the diversion plan had been fully implemented for two weeks.

The post-implementation waste audit followed the same procedure as described for the pre-implementation waste audit (Section 4.1). Appendix E describes the specific waste category descriptions used to identify materials during the audit and Appendix F shows, for each location the pre-implementation waste audit and the post-implementation waste audit data by specific waste category. Summary of the pre- versus post-implementation waste audit findings for the major waste categories of waste, recyclable material and organics appear in Figures 2-4. Waste appears to increase over the course of the field test, particularly at Locations 2, 4, 9 and 10, indicating improved waste diversion. Recyclable material remains relatively unchanged and organics in the waste stream decreases, particularly at Locations 4 and 9, over the course of the project.

At the beginning only four Locations (1,4, 8 & 9) had less waste in the waste stream than the Control Location and at the end of the field test all nine locations had, by weight, more waste in the waste stream than the Control. Further, with the exception of the Control Location, all locations increased the amount of waste in the waste stream over the course of the field test indicating some improvement in waste diversion by this performance indicator at all nine locations as a result of implementing the waste diversion strategies.

**Figure 2: Percent by Weight of Waste in Waste Stream Pre- vs. Post-Implementation**



Recyclable material in the waste stream decreased at five locations over the course of the Field Test. The Control Location as well as Locations 2, 4 and 9 demonstrated an increase in recyclable material in the waste stream over the course of the field test, indicative of a decline in waste diversion performance. Four Locations (3, 6, 7 and 8) demonstrated a marked decrease of recyclable material in the waste stream over the course of the field test.

The waste diversion strategies implemented at the locations with the most significant reduction of recyclable material in the waste stream were:

- Location 3: at the conclusion of the field test the waste diversion strategy had been reversed, however during the field test there were several months when the recyclable material container had been moved inside building. It is possible that the recyclable material container relocation resulted in some long lasting behavioural change at this location resulting in improved participation in the recycling program.
- Location 8: increased recycling capacity and, two weeks prior to the conclusion of the field test, implemented a tenant incentive program involving giving tickets for using the recycling container and drawing for a monthly \$50 prize for the “best recycler”.
- Location 6: moved recycling collection inside the move-in room and locked outside enclosure to prevent the deposit of waste in the recycling container

It is interesting to note that these three locations did not perform well relative to the other locations in their overall waste diversion improvement rank (Section 7): Location 3 was ranked 7 (of 10), Location 8 was ranked 9, Location 6 was ranked 10. All three locations were ranked below the Control Location (rank 6), so while the strategies were sufficient to change the material composition of the waste stream they were not necessarily effective at improving waste diversion.

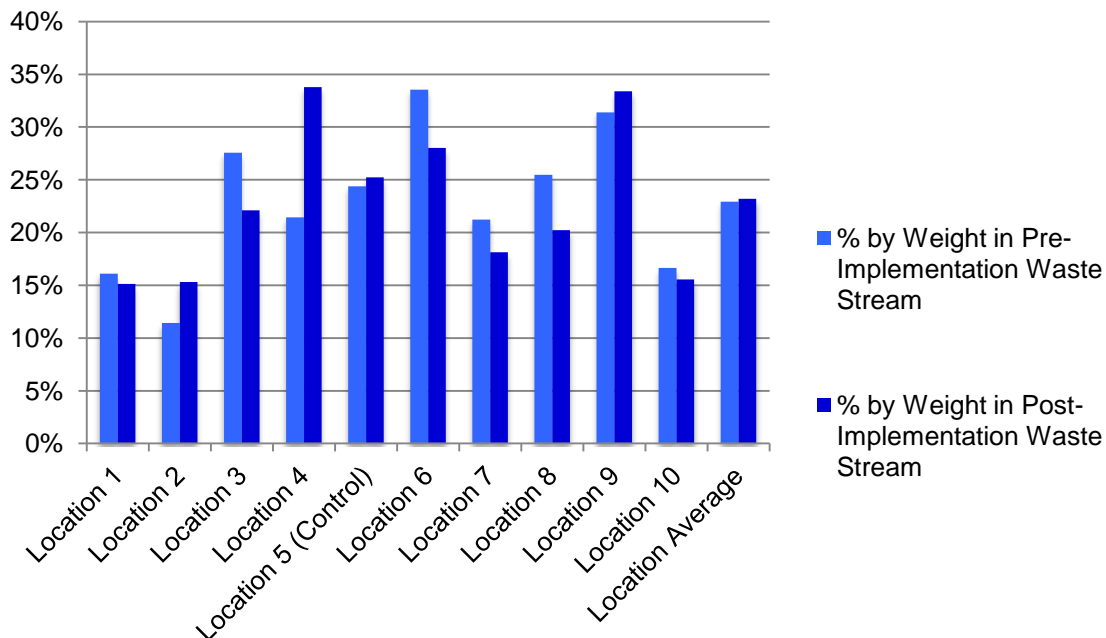
The waste diversion strategies implemented at the locations with a significant increase in recyclable material in the waste stream were:

- Location 4 (up 89.94%): Implemented the City organics program which drove down organics in the waste stream considerably (down 33.2%), this decrease in organics is likely the cause of a proportionate increase in recyclable material in the waste stream
- Location 2 (up 33.89%): brought the organic material drop off location inside the building which drove down organics in the waste stream (down 20.11%), this decrease in

organics is also likely the cause of a proportionate increase in recyclable material in the waste stream

It is interesting to note that these two locations performed very well relative to the other locations in their overall waste diversion performance rank (section 7): Location 4 was ranked 1 (of 10) and Location 2 was ranked 3. Both locations were ranked well above the Control Location (Location 5; rank 6), so while the strategies would appear to be causing an increase recyclable material in the waste stream, it would appear that it is more likely that recycling was not driven down at the same high rate as organic waste as a result of these diversion strategies.

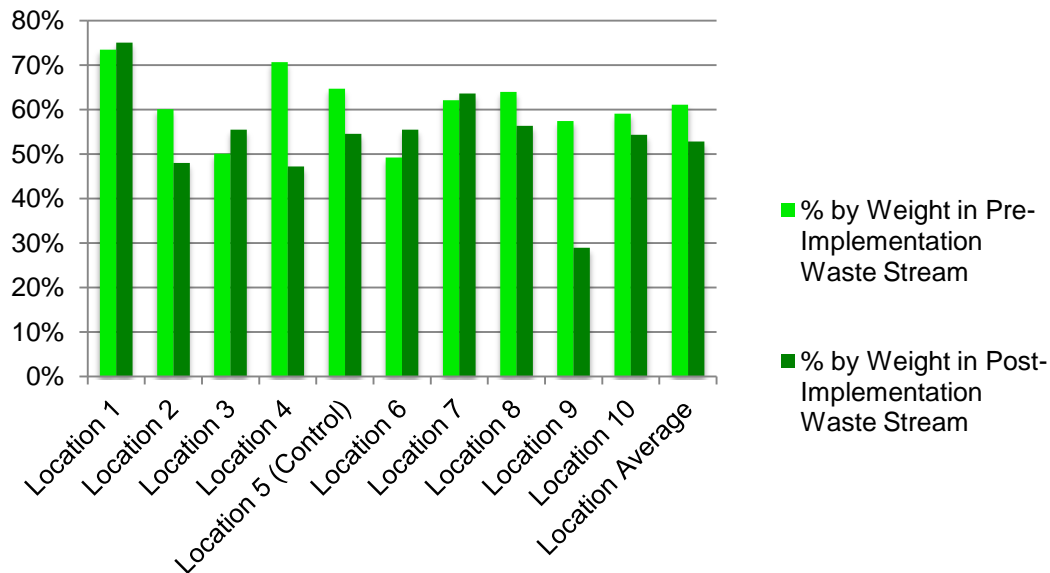
**Figure 3: Percent by Weight of Recyclable Material in Waste Stream Pre- vs. Post-Implementation**



Over the course of the field test, organics in the waste stream decreased more than the Control Location at Locations 2, 4 and 9. Location 4 implemented the City Organics program as part of the field test; and Location 2 enhanced the organics program by creating an indoor drop-off for organics. However, Location 9 which had implemented the City organics program during the field test, had placed the program on hold to resolve an odour issue in the inside recycling room. It is not known if the brief implementation of an organics collection program would have long lasting effects on driving down organic waste in the waste stream (given the organic container was not in place). It could be that the residents may still be bagging organics and bringing them to the recycling area (behavioural change), then depositing the organics elsewhere (recycling container or garbage) when finding the organics container in the inside recycling room was not in place, though there is no evidence to suggest that has occurred.

Location 1 implemented the City organics program and it is not known why the program had no effect at driving organic waste down in the waste stream at this location.

**Figure 4: % by Weight of Organics in Waste Stream Pre- vs. Post-Implementation**



## 6.2 Post-Implementation Waste Generation & Waste Diversion Rates

Two other measures of waste diversion strategy performance utilized in this study include: the amount of waste generated by each location per unit per day; and the location waste diversion rate. The City of Toronto undertook a post-implementation waste, recyclable material and organics weighing program at nine of the 10 locations the weeks of October 15 through 22, 2012. Location 7 is on a roll-cart service and the waste was weighed in February 2013 after the implementation of the waste diversion strategy.

With the exception of Location 7, the location waste was weighed at the first collection day of the week and not following a long weekend. Waste was from a period that included a minimum 4 days generation: 2 weekdays and 2 weekend days. With the exception of Locations 2, 3 and 8, waste weights were for a 4-day collection period. Location 2 waste weight was for a 14 day collection period, Location 3 was for a 4.5 day collection period and Location 8 weight included an “irregular” service third waste bin that weighed 310kg that was not included from the waste weight at this location. Location 7 waste weighing included waste for a 4-day accumulation period.

With the exception of Location 7, recyclable material and organic waste were weighed on the collection day at each location, so the weight represented at 7-day material accumulation. Again, Location 7 is on a cart collection program and the recyclable material weighing was for a 5-day accumulation period. Location 9 recycling bins were not out on weighing day so a recyclable material weight was estimated using the average weight for a cubic yard of recyclable material at the other 8 locations. Recyclable material weighed 42.7 kg per cubic yard and Location 9 puts out three 6-cubic yard containers per week. Table 9 shows waste, organic waste and recyclable material generation rates and waste diversion rates for the locations.

With the exception of Location 7, the waste diversion strategies implemented at the three locations with post-implementation waste diversion rates above the average (28.31%) involved implementing or enhancing an organics program. Location 7 closed the garbage chute and this

resulted in making recycling and waste disposal equally accessible to tenants. The three locations and their waste diversion strategies were:

- Location 2 (56%): 1) Organics inside building drop off, 2) 3Rs Ambassador, 3) Flyers & Signage
- Location 7 (38%): 1) Garbage chute closure, 2) Flyers & Signage
- Location 1 (33%): 1) City Organics implementation, 2) 3Rs Ambassador, 3) Flyers & Signage

The location average waste diversion rate from pre-implementation to post-implementation increased from 26 to 28%. Assuming 30% of the recyclable material is waste, the corrected waste diversion averages from pre- to post-implementation increased from 18% to 20%.

None of the locations achieved Target 70: the City of Toronto's stated waste diversion goal of 70%. Location 2 had the highest waste diversion rate of 56% at the conclusion of the field test. Assuming 30% of the recyclable material is contaminated by waste, the corrected waste diversion rate at Location 2 would be 45%.

**Table 9: Post-Implementation Waste, Recyclable Material and Organics Generation and Waste Diversion Rates**

Location Number	Post-Implementation Waste Gen (kg/unit/d)	Post-Implementation Recycle Gen (kg/unit/d)	Post-Implementation Organic Gen (kg/unit/d)	Post-Implementation Diversion Rate
1	1.45	0.49	0.23	33%
2	0.70	0.59	0.30	56%
3	1.64	0.47	0.13	27%
4	1.38	0.35	0.03	22%
5 (Control)	1.17	0.35	0.00	23%
6	1.35	0.43	0.00	24%
7	0.43	0.26	0.00	38%
8	2.22	0.23	0.00	9%
9	2.27	0.85 <sup>e</sup>	0.00	27%
10	1.72	0.41	0.00	19%
<b>Average</b>	<b>1.46*</b>	<b>0.45*</b>	<b>0.17**</b>	<b>28%*</b>
<b>Corrected Average</b>	<b>1.60*</b>	<b>0.32*</b>	<b>0.08*</b>	<b>20%</b>

<sup>e</sup> - estimated, not weighed, based on recyclable material weight of 42.7 kg per cubic yard

\* - average excludes the Control Location (5)

\*\* - average includes only those locations with organic collection programs (Locations 1,2,3 & 4)

### 6.3 Post-Implementation Waste Diversion Performance

All ten locations were ranked using three waste diversion performance indicators. For each location, the average of the three indicator rankings was calculated to determine an Overall Waste Diversion Performance Rank. Using the same sliding scale as was used in the pre-implementation phase, Table 10 indicates that Locations 2 and 7 had the best diversion programs (Average Rank <3.0); Locations 1, 3, 4, 5, 6, 8, 9 and 10 modest programs (3.0 < Average Rank < 8.5); and one Location (8) had a poor operating program (Average Rank > 8.6) after field

testing the waste diversion strategies. With three more locations in the “Modest” category post-implementation than pre-implementation, it appears that there was a flattening of the waste diversion performance variability within the locations during the course of the field test.

This result suggests that the poorer performers improved proportionately more from the waste diversion field test than the better performers.

**Table 10: Post-Implementation Waste Diversion Performance Ranking**

Location Number	% Waste by Weight in Waste Stream	% Waste Rank	Waste Gen (kg/unit/d)	Waste Gen kg/unit/d Rank	Waste Diversion Rate	Waste Diversion Rate Rank	Average Rank (3 Indicators)	Overall Waste Diversion Rank	Post-Implementation Waste Diversion Performance
1	9%	9	1.45	6	33%	3	6.0	6	Modest
2	35%	1	0.70	2	56%	1	1.3	1	Good
3	19%	4	1.64	7	27%	5	5.3	3	Modest
4	17%	6	1.38	5	22%	8	6.3	7	Modest
5 (Control)	8%	10	1.17	3	23%	7	6.7	8	Modest
6	13%	7	1.35	4	24%	6	5.7	5	Modest
7	17%	5	0.43	1	38%	2	2.7	2	Good
8	9%	8	2.22	9	9%	10	9.0	10	Poor
9	32%	2	2.27	10	27%	4	5.3	3	Modest
10	30%	3	1.72	8	19%	9	6.7	8	Modest

The same Locations (2 and 7) were the top performers post-implementation as pre-implementation. Location 2 created an indoor recycling/organics area; and Location 7 closed the chute making recycling and waste disposal equally accessible. The highest performers went further in commitment and complexity to improve performance.

Locations 8 and 10 had the poorest waste diversion performance at the conclusion of the field test. Location 8’s final waste assessment was conducted only two weeks after having implemented their waste diversion strategy. The strategy included increasing recycling capacity, having a monthly draw for a \$50 Gift Card for “the best recycler” (tenant incentive) and handing out flyers and updating signage. Management and staff reported that in those two weeks there was a marked uptake in the recycling program participation. It is likely this location’s waste diversion performance was not yet realized at the time of the final waste assessment. Location 10’s waste diversion performance was poor relative to the other locations however it did have a high ranking (3 of 10) for the percent of waste by weight in the waste stream at the post-implementation audit. Location 10 implemented a strategy that involved increasing recycling capacity and making recycling easier for tenants (switching from multiple small volume roll-cart recycling to large volume front-end recycling service), implement E-Waste program and distribute flyers and update signage. It is not clear why waste diversion rates and waste generation rates did not improve more significantly at this location during the field test.

## 7.0 Measuring the Effectiveness of Waste Diversion Strategies: Comparing Pre- to Post-Implementation Waste Diversion Performance

### 7.1 Change in Amount of Waste in the Waste Stream

The first of three measures used to determine the effectiveness of a waste diversion program was the amount of waste in the waste stream. If the amount of waste in the waste stream increases from the pre- to post-implementation period, this is considered an improvement in waste diversion performance. The percent change in waste by weight in the waste stream from pre- to post-implementation is calculated for each location in Table 11 below.

**Table 11: Net Change in Percent by Weight of Waste in the Waste Stream From Pre- to Post- Implementation**

Location Number	Pre-Implementation Audit % Waste by Weight in Waste Stream	Post-Implementation Audit % Waste by Weight in Waste Stream	% Change	% Waste by Weight in Waste Stream Improvement Rank
1	8.40%	9.23%	9.88%	9
2	25.71%	34.93%	35.86%	4
3	17.31%	19.49%	12.59%	8
4	4.44%	17.35%	290.77%	2
5 (Control)	9.72%	8.00%	-17.70%	10
6	11.07%	13.12%	18.52%	6
7	13.58%	17.39%	28.06%	5
8	8.28%	9.37%	13.16%	7
9	8.17%	32.26%	294.86%	1
10	15.15%	29.75%	96.37%	3
<b>Average</b>	<b>12.18%</b>	<b>20.32%*</b>	<b>66.80%*</b>	-

\* Averages exclude the Control Location (5)

With the exception of the Control Location, all locations increased the amount of waste in the waste stream indicating some measure of improvement in waste diversion over the course of the field test. The average increase in waste by weight in the waste stream for all locations was 66.8% (excluding the Control Location).

Locations 9 and 4 showed the most significant improvement in the amount of waste in the waste stream during the field test, both with an over 290% increase. The waste diversion strategies employed at these locations were:

Location 9: 1) Create indoor recycling area & 2) Flyers & Signage

Location 4: 1) City Organics, 2) Increased recycling capacity & 3) Flyers & Signage

## 7.2 Change in Waste Generation Rates

Waste generation rates were calculated pre- and post-implementation using waste weight information obtained from the City of Toronto. Pre- and post-implementation surveys indicated that there was little to no change in occupancy at any of the locations so the waste weight was divided by the number of total units in the locations for both the pre-implementation and post-implementation weights. Over the course of the field test, waste generation decreased at five Locations (2, 4, 5-Control, 7, 9 & 10) and increased at four Locations (1, 3, 6 & 8) (see Table 12).

**Table 12: Net Change in Waste Generation Rate from Pre- to Post-Implementation**

Location Number	Pre-Implementation Waste Gen (kg/unit/d)	Post-Implementation Waste Gen (kg/unit/d)	% Change	Waste Generation Rate Improvement Rank
1	1.22	1.45	19%	9
2	0.92	0.70	-24%	1
3	1.59	1.64	3%	7
4	1.68	1.38	-18%	3
5 (Control)	1.51	1.17	-23%	2
6	0.81	1.35	66%	10
7	0.49	0.43	-12%	4
8	1.91	2.22	16%	8
9	2.52	2.27	-10%	5
10	1.75	1.72	-2%	6
<b>Average</b>	<b>1.51*</b>	<b>1.46**</b>	<b>-3.5%***</b>	<b>NA</b>

\* Average excludes Location 6 due to high contamination of recycling stream pre-implementation

\*\* Average exclude the Control Location (5)

\*\*\* Average excludes both Location 5 (Control) and 6 (contamination)

Excluding the Control Location (5) and Location 6 (high contamination in recycling stream pre-implementation) the average waste generation per unit decreased only 3.5% over the course of the waste diversion field test.

Location 2, 4 and 6 demonstrated the most significant decrease in the waste generation rate over the course of the field test. The waste diversion strategies utilized at these locations were:



- Location 2: 1) establishing an inside area for organics collection, 2) 3 Rs Ambassadors, 3) Flyers & Signage
- Location 4: 1 City organics implementation, 2) Increased recycling capacity, 3) Flyers & Signage
- Location 6: 1) Provide inside recycling in move in room (locked outside enclosure), 2) Flyers & Signage

Curiously Location 5 (Control Location) had the second most significant improvement in the waste generation rate over the course of the field test. Property management at Location 5 indicated that they had made no changes to waste management during the course of the field test nor had there been any significant changes in the occupancy rate. There is no explanation for this finding except the inherent variations that would be experienced by all locations that are caused by:

- 1) The variation in the amount of waste contamination in the recycling container;
- 2) The variation in the seasonal timing of the waste weighing program from pre- to post-implementation; and
- 3) The natural variations in waste generation rates in general.

Location 6 demonstrated the biggest increase in waste generation rate over the course of the field test however this location was identified at the pre-implementation audit as having significant waste contamination in the recycling stream (Section 4.2). Consequently it is believed that the pre-implementation waste generation as well as diversion rates at this location are over-stated resulting in the waste diversion improvement performance not being captured by the measurement parameters employed in this field test.

### 7.3 Change in Waste Diversion Rates

Waste diversion rates were calculated for the pre- and post-implementation using the waste, recyclable material and organics weighing information provided by the City of Toronto through the materials weighing programs. Organic waste pre-implementation were not weighed at Locations 2 and 3 but were estimated (see section 4.2). Location 6 pre-implementation waste diversion rate was not included in the average as there was significant contamination in the recycling stream pre-implementation likely significantly over stating that location's waste diversion rate (section 4.2). Location 5 (Control) post-implementation waste diversion rate was also not included in the average as it was a control for the "change nothing" approach to waste diversion.

Locations 4, 9 and 10 showed the most significant improvement in the waste diversion rate over the course of the field test, with over 40% increase. The waste diversion strategies employed at these locations were diverse involving implementation of the City's organics program, increasing recycling capacity and making recycling easier by bringing it inside. By location, the waste diversion strategies are:

- Location 4: 1) City organics implementation, 2) Increased recycling capacity, 3) Flyers & Signage
- Location 9: 1) Create indoor recycling area, 2) Flyers & Signage
- Location 10: 1) Change from roll-cart to front-end recycling service – increasing ease of recycling and recycling capacity, 2) City E-Waste program implementation, 3) Flyers and Signage

Locations 6 and 3 had the most significant decline in waste diversion rates. Location 6 because the waste diversion rate was over-stated in the pre-implementation phase due to significant contamination of waste in the recycling stream (section 4.2); and Location 3 possibly because the

waste diversion strategy that was implemented during the course of the field test was abandoned upon a change of ownership and management prior to the end of the field test.

**Table 13: Net Change in Waste Diversion Rate from Pre- to Post-Implementation**

Location Number	Pre-Implementation Diversion Rate	Post-Implementation Diversion Rate	% Change	Waste Diversion Rate Improvement Rank
1	27.08%	32.98%	21.76%	4
2	50.59%	56.02%	10.73%	5
3	31.64%	26.68%	-3.79%	6
4	11.33%	21.52%	89.92%	1
5 (Control)	25.87%	22.97%	-11.23%	7
6	51.99%	23.99%	-53.85%	10
7	46.82%	37.78%	-19.30%	8
8	13.29%	9.45%	-28.86%	9
9	16.77%	27.23%	62.33%	2
10	13.64%	19.17%	40.54%	3
<b>Average</b>	<b>26.37%*</b>	<b>28.31%**</b>	<b>7.35%</b>	<b>NA</b>
<b>Corrected Average</b>	<b>18.00%</b>	<b>20.44%</b>	<b>13.55%</b>	<b>NA</b>

\* Average excludes Location 6 due to high contamination of recycling stream pre-implementation

\*\*Averages exclude the Control Location (5)

## 7.4 Change in Waste Diversion Performance

To identify the locations with the greatest waste diversion improvement over the field test, the net change in the waste diversion performance was calculated by averaging each location for each of the three waste diversion indicators and then ranking the result (Table 14).

**Table 14: Overall Waste Diversion Performance Improvement Pre- vs. Post-Implementation**

Location Number	% Improvement Waste in Waste Stream Rank	% Improvement Waste Gen Rate Rank	% Improvement Waste Diversion Rate Rank	Average Waste Diversion Improvement Rank	Overall Waste Diversion Improvement Rank
1	9	9	4	7.33	8
2	4	1	5	3.33	3
3	8	7	6	7.00	7
4	2	3	1	2.00	1
5 (Control)	10	2	7	6.33	6
6	6	10	10	8.67	10
7	5	4	8	5.67	5
8	7	8	9	8.00	9
9	1	5	2	2.67	2
10	3	6	3	4.00	4

The waste diversion strategies with the greatest waste diversion improvement, listed from most effective to least effective as well as the duration of implementation and costs are presented in Table 15.

Five Locations (4, 9, 2, 10 and 7) showed the most significant waste diversion performance improvement over the course of the field test and performed better than the Control Location (5). The common aspects and waste diversion strategy elements of the locations with the most improved waste diversion performance during the field test include:

- Waste Diversion Strategy Launch: They all had hosted events or gone door-to-door to implement waste diversion strategies and had distributed flyers and updated signage.
- Waste Diversion Strategy Type: There was no one type of waste diversion strategy that led to better results as the successful locations implemented a mix of recycling/organics facilitation (Location 2, 9 and 10), organics implementation (Location 4), increasing recycling capacity (Location 4 and 10), and making waste disposal equally convenient to recycling (Location 7).
- Building Size: All three small buildings (Locations 2, 7 and 10) that participated in the field test demonstrated significant improvement in waste diversion performance and were in the most improved group. This could indicate that the field test time span was more suitable to seeing change in a smaller context. Larger buildings may need more time to implement changes with measurable improvements.
- Demographic: There are no demographic aspects that correlate with diversion performance.
- Ownership/Management: There are no ownership/management commonalities among the better performing buildings but there was a mix of owner managed and third party managed buildings in both the successful and the most improved groups.
- Length of Implementation: With the exception of Location 7 that had implemented the waste diversion strategy for only 2 weeks, the other four locations in the most improved group had implemented the waste diversion strategies for 2 or more months. By

- comparison, the other less successful locations had implemented their strategies for less than one month. Location 1 was the exception to this as it had implemented the strategy for 5 months yet experienced little to no improvement in waste diversion. The reason for the lack of success at this location is unknown particularly because the tenants and management believe waste diversion improved over the course of the field test.
- Cost of Implementation: The most improved group spent a little more on average \$2,220 as compared to all locations average \$1,714 in implementing the selected waste diversion strategies. Further, the most improved group spent a little more time, 8.1 hours on average as compared to all locations average of 5.8 hrs, in implementing the strategies.
  - Economic Impact of implementation: In the most improved group, there were operational savings of 1.1 staff hours per wk as compared to the locations average of 0.17 staff hours per week; but there were no financial savings in the most improved group as compared to the location average which was calculated to be a savings of \$16/week. It is likely that it is too soon after implementation for any economic impacts, particularly those associated with reduced waste collection service with the City, to be realized and measured. The City should consider contacting the locations 12 months post-implementation to get a better measure of economic savings.

Locations 3, 1, 8 and 6 all demonstrated less waste diversion performance improvement over the course of the field test than the Control Location (5). These locations did not perform well largely because the waste diversion strategies were not implemented or had been implemented for a very short period of time (less than a month). The one exception is Location 1 where it is not known why the waste diversion strategy did not result in any measurable improvement in waste diversion at this location particularly in light of the fact that management and staff both report that there was significant uptake in the waste diversion strategy of implementing the City organics program.

**Table 15: Waste Diversion Strategies from Most Improved Waste Diversion Location to Least Improved**

Waste Diversion Improvement Rank	Location Number	Waste Diversion Strategy	Months Strategy Implemented	Waste Diversion Strategy Implementation Costs		Waste Diversion Strategy Operational Costs / Benefits	
				Dollars	Staff Hrs	Dollars/ Week	Staff Hours/ Week
1	4	1) City Organics Implementation, 2) Increased recycling capacity, and 3) Flyers & Signage	2	\$2,400	5.5	\$0	0
2	9	1) Create indoor recycling area (organics program on-hold) and 2) Flyers & Signage	4	\$2,000	15	\$0	Savings 3.5
3	2	1) Organics inside building drop-off, 2) 3 Rs Ambassador, and 3) Flyers & Signage	6	\$0	8	\$0	Savings 2.5
4	10	1) Change from roll-cart to Front-end recycling service, 2) City E-Waste Implementation, and 3) Flyers & Signage	5	\$2,000	4	\$0	0
5	7	1) Garbage Chute Closure, and 2) Flyers & Signage	<0.5	\$4,700	8	\$0	Savings 1.5
6	5	None. Control building.	0	\$0	0	\$0	0
7	3	1) Create indoor recycling and organics area and 2) Flyers & Signage. Note: None were fully implemented by conclusion of field test though had been implemented during the field test for several months.	NFI	\$825	1	\$0	Cost 2
8	1	1) City Organics Implementation, 2) 3 Rs Ambassadors, and 3) Flyers & Signage	5	\$1,400	2	Savings \$78	0
9	8	1) Increase recycling capacity & distribute recycling bags to tenants, 2) Tenant incentive program and 3) Flyers & Signage	<1	\$1,200	6	Savings \$66.50	Cost 2
10	6	1) Provide inside recycling in move-in room (locked outside enclosure) and 2) Flyers & Signage	<1	\$900	3	\$0	Cost 5
<b>Average</b>			<b>3*</b>	<b>\$1,714*</b>	<b>5.8*</b>	<b>Savings* \$16/wk</b>	<b>Cost* 0.17 hrs/wk</b>

NFI- -not fully implemented at the end of the field test

\* Average for all locations with exception of the Control Location (5)

## 7.5 Factors Affecting Waste Diversion Strategy Selection

It was often found that property managers and other building decision makers do not believe the effort to be undertaken to make waste management improvements will be offset by financial savings. Simply put, there not a compelling financial savings in improving waste diversion at the buildings in spite of the City of Toronto's waste levy program. And to increase the waste levy in order to drive waste diversion would likely result in buildings opting to employ private sector waste collection as it would be more competitively priced.

It requires an informed, motivated and committed decision maker to design and implement waste management changes at multi-unit residential buildings. Waste management is not considered critical as to warrant the development of waste management plans/procedures nor provide staff training in waste management.

The field test was limited in its ability to test a wide range of strategic options as the decision makers at the locations were unwilling to neither make significant financial capital investment nor implement any program with significant impacts on staffing. The lack of financial incentive and long pay back periods for any strategy requiring major capital investment drove many of the locations to implement similar strategies: those that were both easy, inexpensive and had minimal impact on staffing.

Strategies lost to Capital considerations included:

- External chute (Rejected at Location 5)
- In Sink Organics (Rejected at Location 10)
- Bi-sorter (Rejected at Location 3)

Strategies lost to Operational impacts included:

- Floor to floor collection using chute rooms (Rejected at Locations 2, 3, 5 and 10)
- Door to door collection (Rejected at Locations 2, 8 and 9)

The average cost to implement a waste diversion strategy during this field test was \$1,714 with a high of \$4,700 and a low of \$0. The average staffing required to implement was 5.6 hours with a high of 15 staff hours and a low of 1 staff hour.

## 7.6 Factors Affecting Waste Diversion Strategy Implementation

Due to its low priority, waste management procedures are rarely documented. As a result, changes in staffing not only prevents continuous improvement but risks the loss of lessons learned by reversing waste diversion progress without any understanding of the impacts.

Every location experienced changes in ownership, property management and staffing over the course of the field test: there were site staff changes (often with vacancy in positions) or new property managers at eight of the ten locations. Only two locations had relatively consistent staffing (Location 4 and 6). Interestingly Location 4 had the best waste diversion performance improvement over the course of the field test; while Location 6 had the worst improvement in spite of the fact that they were under the same management and shared the same waste management employee. Location 6 had only implemented its waste diversion strategy less than one month prior to the final waste assessment and had a noted contamination of waste in the recycling containers at the pre-implementation phase. It is likely this location waste diversion performance improvement was only partially realized and not captured by the field test experience.

Some examples of failures/near failures caused by staffing and staff empowerment include:

- Location 3 reversed its strategy one month prior to the end of the field test when there was a change in ownership and management.
- Location 7 experienced a delay in the construction of an enclosure as part of the chute closure program when there was a change in management and staffing at this Location.
- Location 8 delayed implementation of a tenant incentive strategy until a change in staffing occurred. The new staff felt empowered and implemented the strategy but with little time to measure its effectiveness by the conclusion of the field test.

## 7.7 Social and Educational Benefits of Waste Diversion

At the conclusion of the field test, during the post-implementation waste audit, Location Teams were surveyed to capture information regarding the field test experience with an aim to identify any communication, social, educational or community benefits associated with the field test. The post-implementation survey is combined with other quantitative and qualitative information gathered during the field test activities and is presented in the Location Summary Tables for each of the 10 locations (Appendix I). These summary tables are a one-page snapshot of each locations' building, demographic, ownership & management aspects as well as the locations' waste diversion strategies, the associated costs & benefits, and effectiveness.

Eight locations employed events that had tenants come together or meet in order to distribute materials, obtain feedback, or run a tenant incentive program. These events were opportunities for the community to learn, socialize and meet the site staff. The smallest location (Location 7) went door-to-door to educate tenants in the waste diversion program. One location did not personally engage tenants (Location 3).

Of these nine locations five (1,4,6, 7 and 9) reported improved communication with tenants & tenant/staff better educated; three (2, 8 and 10) reported improved communication with tenants but did not feel better educated in waste management and waste diversion.

Location 3 was the only location that did not perform any outreach and it was the only location that reported no improvement in education or improvement in staff-tenant communications. Location 3 also demonstrated a poor waste diversion improvement over the course of the field test (ranked 7 of 10) below the Control Location (Location 5 was ranked 6).

This field test therefore suggests that hosted events and in-person outreach campaigns, the bringing together of tenants and staff, not only brings about social and educational benefits but events also contribute to waste diversion strategy implementation success. Hosting events and other in-person tenant outreach should be considered in implementing all waste diversion strategies.

## 7.8 Overall Key Conclusions

1. Waste diversion improvement is possible with time, commitment and a consistent approach.
  - All test locations increased the amount of waste in the waste stream (increased diversion)



- The field test concluded within a relatively short time of implementation yet still achieved measurable performance results
  - All buildings had the potential for improvement by adopting low cost investments that had measurable outcomes
  - Management support, staff motivation and empowerment were critical to success
  - Waste diversion improvement was incremental with the adoption of new diversion strategies indicating that waste diversion enhancement should be a continuous process and not a one time event
2. Management and staff education as well as resident communication are critical to waste diversion improvement success.
    - Management and staff at all test locations benefited from the location waste management program assessment and information on the full suite of waste diversion strategies available for implementation
    - Management and staff education allowed for the selection of appropriate strategies to apply from a continuum of education tools, communication means and equipment/structural enhancements (in future, this could be facilitated by the use of the Tower Renewal STEP Program checklist)
    - Communicating building waste diversion activities and performance to residents encouraged the adoption and participation in waste diversion activities
  3. Changes in building ownership as well as management and staff turnover have a substantial and detrimental impact on performance; while structural changes and new residents provide opportunities for improvement.
    - Changes in ownership and management/staff created discontinuity that delayed the adoption of strategies, reduced adherence to guidelines and diminished performance
    - Actively managing change to maintain momentum of measures through documenting on-site procedures could improve outcomes
    - New residents provide an opportunity to engage and encourage waste diversion practices
    - Building structural changes, renovations and special projects provide an opportunity to enhance or adopt new waste diversion strategies

## 8.0 RECOMMENDATIONS

### 8.1 Recommendations for Multi-Unit Residential Property Owners and Managers

There is need for waste management training/support at multi-unit residential buildings. Building owners do not consider waste management or waste diversion a priority area for allocating financial or staffing resources. This combined with significant turnover in the staffing at multi-unit residential buildings makes it difficult to identify, execute and maintain meaningful waste diversion improvements with lasting waste diversion success.

Consequently a continuous improvement framework for improving waste diversion while addressing high staff turnover and its loss of site procedures and protocols is warranted. The Tower Renewal STEP checklist provides a guide to assessing a building's current conditions for achieving waste diversion and, based on the existing level, provides guidance to incremental manageable improvements to undertake (see Appendix J). There is an accompanying opportunity to determine how a building is performing compared to similar buildings through a benchmark that ranks site performance. The Tower Renewal STEP checklist is available at: [https://wx.toronto.ca/intra/it/pubformrep.nsf/cf31a385c46c917b85257460004920a9/903cc280a5a60ff5852579910066a9c8/\\$FILE/36-0004.pdf](https://wx.toronto.ca/intra/it/pubformrep.nsf/cf31a385c46c917b85257460004920a9/903cc280a5a60ff5852579910066a9c8/$FILE/36-0004.pdf)

## 8.2 Recommendations for the City of Toronto

Although the findings of this field test indicate it will be challenging for the estimated 1,000 pre-1984 construction apartments in the City of Toronto to achieve the City's stated target of achieving 70% waste diversion (Target 70, older buildings can improve waste diversion and, as indicated by this field test, can do so with modest staffing investment (less than 10 hours) and at a modest cost (less than \$2,000).

To engage, assist and support older building owners and managers in improving waste diversion there are a number of recommendations the City may wish to consider. These recommendations include both those that address barriers to improved waste diversion as well as of supports that the City may wish to consider implementing.

- 1) Resourced available through the City of Toronto Solid Waste Management website (available at <http://www.toronto.ca/garbage/multi/>) were found to be useful but some additions could be made to aid site implementation.  
Recommendation: Update the Waste Diversion Handbook to include templates for solid waste management procedures and training templates for multi-unit residential building staff to ensure easy transition during staffing changes.
- 2) City's 3Rs Ambassadors – Due to transient nature of participants it is difficult to sustain this measure particularly where youth are engaged.  
Recommendation: Focus 3Rs Ambassador program at adults and consider creating a broader scoped program that includes training to support a career path for youth 3Rs Ambassadors. For example, 3Rs Ambassadors may provide summer relief work supporting/training other multi-unit residential property staff in waste diversion projects (see recommendations 6 and 7 below).
- 3) Better Coordinate City's Chute Closure Program – Departmental communications and overlap between Municipal Licensing and Solid Waste inspectors causes confusion and wastes time.  
Recommendation: Suggest training a dedicated standards inspector for waste management to oversee the chute closure program and other waste management "standards" matters.
- 4) Improve City's Organics Program – With established organics program, some large family buildings would benefit from additional/larger organics containers to capture more organics (Ex. Diapers)  
Recommendation: Consider financing additional/larger in-suite organic containers for buildings with large-families.
- 5) Improve City's Recycling Program – Once per week collection at buildings with limited space means many 6-yard containers are in use and these are too tall for many people to use, are a disincentive to participation and lead to the creation of litter.  
Recommendation: Consider increasing the collection service at these buildings to twice per week to encourage the use of lower profile 4-yard containers to address accessibility needs.
- 6) Provide Waste Diversion Workshops/Training events for multi-unit residential property managers and site superintendents  
Recommendation: Roll-out a program of a series of half day workshops for multi-unit residential property managers and superintendents to cover topics such as: waste

management best practices, documenting and updating waste management practices, developing waste diversion strategies; and implementing waste diversion strategies.

- 7) Establish a New City Front-line Support Program – Multi-unit residential property owners/managers and staff requires motivation to make waste diversion changes and require support, education and guidance in identifying and implementing strategies. Recommendation: Provide waste management consulting services to all multi-unit residential properties with a focus on older apartment buildings in the City. Divide the city into geographic areas or divide buildings into types (low rise, high rise, condo) for waste management specialists. With approximately 5,200 multi-unit residential buildings in Toronto, one could assume 500 customers per inspector or 10 inspectors for three years. Initially, the City may wish to focus on under performing average to large single-chute buildings. To provide a potential career path out of the 3R's Ambassadors program the City may wish to selectively employ successful and experienced 3Rs Ambassadors when appropriate.

Other recommendations:

- 1) New City Waste Levy Amnesty Program – Potential savings in waste disposal through City's waste levy are not sufficient financial motivation to multi-unit residential property decision-makers to implement changes to enhance waste diversion. Recommendation: Establish a program to provide several month suspension of fees to properties undertaking a waste diversion program. Require an application and a commitment to the city to continue on City waste services for a specified period of time. The program could be run through the "New City Front-Line Support Program" if adopted or could be an employment opportunity for experienced 3Rs Ambassadors.
- 2) New City Single-Stream Collection Program Option - Recognize that without significant investment in infrastructure and building management/staff that garbage chutes operate often as a size separator rather than waste vs. recoverable material separator. Recommendation: Consider co-mingling apartment waste, organics and recycling for management at single-stream facility where recycling would occur. Undertake a feasibility study to establish single stream waste/recycling/organics facilities for receipt of waste from the single-chute high-rise buildings in the City. This option would negate the need to consider any of the other recommendations found in this report.

## APPENDICES

## A) Tower Questionnaire

### TOWER RENEWAL PROJECT – WASTE DIVERSION PRELIMINARY SITE-SELECTION QUESTIONNAIRE

Building Address:

Property Owner Contact Information:

1. Have you read the “Expression of Interest” and do you agree in principal to participate in the Field Test project?
2. Property ownership type: (i.e. Condo, Market Rental, Social Housing)
3. Management type (owner, other):
4. Is this one of original phase I Tower Renewal Waste Diversion Field Test sites?
5. When was this building constructed (Note: must be pre-1980 construction)?
6. Is the building on City Waste Collection Program (Note: must be on City program)?
7. How many floors are there in this building?
8. For this building what are the current Cubic Yards Waste/Unit generated (information can be found in City Utility Bill)?
9. Does the building have/use chute rooms? - If yes, provide actual dimensions of the chute rooms where available

10. What is the size of the compactor room? Provide actual dimensions where available (including height)
11. What is the size of the recycling room or indoor/outdoor storage area that residents use?
12. Describe how residents access the recycling room/container storage area?
  - a. In your opinion, is this an easy access, moderately easy, or difficult to access location?
13. Is the compactor/container storage area indoor or outdoor?
14. Is the building currently under construction/renovation? Describe.
15. What is the most common family type in this building - seniors, families, singles, other. Describe as best as possible:
16. Does the building have a resident's organization/committee in place? If yes, approximately how many members? Are they active? Is there a recycling ambassador?

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Thank you for your interest in this project.

For help completing this application, please contact Jessica Campbell at 416 629-6040.

Please forward completed applications to Jessica Campbell, Spinnaker Recycling Corp. at:

Email: [jessica@spinnakerrecycling.com](mailto:jessica@spinnakerrecycling.com) or  
FAX: 905-671-2736



## B) Commitment Letter

### **TOWER RENEWAL WASTE DIVERSION FIELD TEST PROJECT August 26, 2011**

This document is intended as a communication tool so that each participant in the Tower Renewal Waste Diversion Field Test at \_\_\_\_\_ (the “Project Building”) can be assisted in understanding, coordinating and executing their activities in carrying out the initiative.

The parties participating in the activities are:

The “Building Owner” is \_\_\_\_\_. Persons that will be involved in this project for this “Project Building” include:

Property Manager (name): \_\_\_\_\_

Site Manager (name): \_\_\_\_\_

Other (list additional names): \_\_\_\_\_

Spinnaker Recycling has been undertaking a wide range of waste diversion initiatives in and around the City of Toronto, with particular emphasis and success in improving waste diversion in the multi-unit residential sector. Spinnaker brings over 50 years combined experience in waste management and works with stakeholders to identify and implement waste reduction strategies that match each building’s unique needs.

City of Toronto Tower Renewal was started in 2008. It is a program to drive broad environmental, social, economic, and cultural change by improving Toronto's concrete apartment towers and the neighbourhoods that surround them. The apartments are some of the city's most inefficient buildings, and they present us with an incredible opportunity for improving building performance measures and leveraging this as a means to community revitalization.

In August 2011 representatives of the “Building Owner”, Spinnaker Recycling and the City of Toronto determined that there was an important opportunity to combine efforts that will result in the mutually desired objectives to be met.

This document describes the scope of the activities that will form the Project.

The Project seeks to:

1. Provide additional opportunities for residents to engage in improving their community, specifically in this project through improving waste diversion
2. Provide useful education and training opportunities for residents
3. Provide useful education and training opportunities for building management
4. Promote a cohesive approach shared by residents and building management
5. Improve the apartments' environmental performance (i.e. increase recycling rates)
6. Reduce building utility operating costs

The activities to be undertaken are:

The "Building Owner" will arrange for residents to participate in the project by:

- i) identifying and contacting individuals likely to have interest
- ii) undertake general outreach to residents
- iii) provide meeting space

The "Building Owner" will:

- i) provide access to the site for inspection of the current waste handling facilities
- ii) provide access to site staff for interviews regarding current waste handling practices
- iii) provide access to the site for waste sampling, measurement and waste auditing activities
- iv) provide access to all records regarding waste quantities

The "Building Owner" will undertake best efforts to implement measures identified by Spinnaker Recycling, including acting to:

- i) schedule meetings with the resident group or representative(s)
- ii) review recommendations and respond with specific feedback
- iii) provide funding of measures agreed upon for implementation (for example purchasing communication materials, providing recycling containers, provide performance incentives to residents, modify building operating procedures)

The City of Toronto will:

- i) provide expertise (such as advise from Spinnaker Recycling and/or the Solid Waste Management Division) and support activities such as arranging for participation in a building operator waste diversion training workshop
- ii) monitor and report on the project activities, including benchmarking current condition, assessing impact that measures have on utility costs, with a view to preparing a business case

It is expected that the Project will commence in August 2011 and conclude in May 2012.

I have read the Tower Renewal Waste Diversion Project Description above and, having the authority as \_\_\_\_\_ (title) of the "Project Building", agree to participate and fulfill those requirements as stipulated as "Building Owner" in this document.

\_\_\_\_\_  
Name (print clearly)

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

### C) Tower Locations

Locations Selected to be Part of the Field Test

Location Number	Property Owner-ship	Property Management	Tower Age	Ward #	Residents
1	Large private	Owner managed	1971	34	Mix of all family types
2	Condo	3rd Party	1981	26	Seniors, Singles. Few families are moving in.
3	Large private	3rd Party	over 25 yrs old	33	Families
4	Large private	3rd Party	over 25 years old	29	Families
5	Small private	3rd Party	over 25 years old	31	Family.single mothers
6	Small private	3rd Party	over 25 years old	43	Single mother family/students
7	Large private	Owner managed	1963	22	Seniors, singles , families
8	Large private	3rd Party	Early 1970s	8	Single mother families
9	TCHC	Owner managed	1979	5	Families with children. 34 2 bed and 95 3 bed units
10	Large private	Owner	pre 1970	5	Families

Towers Considered but Not Selected to Be Part of the Field Test:

Property Number	Property Ownership	Property Management	Tower Age	Ward #	Family Type	Selected for Site Visit
1	Large private	Owner managed	1971	34	Mix of all family types	Yes
2	Large private	Owner managed	1968	23	Mix of all family types	Yes
3	Large private	Owner managed	1968	23	Mix of all family types	Yes
4	Condo	3 <sup>rd</sup> Party	1979	28	Seniors, Singles & Prof couples. Not many families.	Yes
5	Condo	3rd Party	1979	28	Seniors, Singles & Prof couples. Not many families.	Yes
6	Private	3rd Party	over 30 yrs	8	Families	No
7	Private	3rd Party	over 25 years	14	Seniors/families	No
8	Private	3rd Party	over 25 years	37	Families	No
9	Private	3rd Party	over 25 years	2	Families	No
10	Private	3rd Party	over 25 years	5	Seniors/families	No
11	Private	3rd Party	over 25 years	12	Families, singles	No
12	Large private	Owner managed	Pre-1980	16		No
13	Large private	Owner managed	Pre-1980	12		No
14	Large private	Owner managed	Pre-1980	21		No
15	Large private	Owner managed	Pre-1980	10		No

16	Large private	Owner managed	1957-58	22	Seniors, singles, some families	No
17	Private	Owner Managed	1968	22	Mixture of seniors, singles, young professionals. Some families.	Yes
18	Private	Owner Managed	1968	22	Mixture of seniors, singles, young professionals. Some families.	Yes
19	Private	Owner managed	Pre-1980	40		No
20	Large private	Owner managed	Pre-1980	10		Yes
21	Large private	Owner managed	Pre-1980	31		Yes

## D) Tower Renewal Waste Diversion Workshop Slide Presentation

**Tower Renewal  
Waste Diversion Workshop**  
September 28, 2011

*Improving the environment and building  
community through a shared goal of  
improving waste diversion at 10 multi-unit  
residential buildings in the City of Toronto*




SPINNAKER  
RECYCLING CORP.

**Today's Objectives**

- Pilot Tower Team building: developing a working relationship with a common goal
- Networking: making connections between Pilot Tower Teams
- Have the 10 Pilot Tower Teams start to think about what strategies will work best at their building
- Have the 10 Pilot Tower Teams to identify early any potential barriers to success


*—Please remember that this is your workshop:  
please ask questions and share your waste  
diversion experiences*



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647-463-1723 info@spinnakerrecycling.com

**Today's Agenda**

- Introductions: the speakers and the Pilot Tower Teams
- Review this pilot project: the need, its goals and time-lines
- Introduce the 10 pilot tower buildings
- Discuss existing City of Toronto programs:
  - waste diversion programs
  - 3R's Ambassador program
- Discuss the full range of waste diversion strategies suitable for implementation at multi-unit residential apartments



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**Key Contacts & Your Speakers:**

**Spinnaker Recycling Corp:**

- Gerald Grant, [ggrant@spinnakerrecycling.com](mailto:ggrant@spinnakerrecycling.com)
- Nancy Moran, [nmoran@spinnakerrecycling.com](mailto:nmoran@spinnakerrecycling.com)
- Jessica Campbell, [jessica@spinnakerrecycling.com](mailto:jessica@spinnakerrecycling.com)

**City of Toronto:**

- Eleanor McAteer, Project Director – Tower Renewal
- Dan Smit, Supervisor Contracted Services
- Charlotte Uetla, 3R's Ambassador Program

**Metro Group:**


- Doug King, [douging@metrogroupcan.com](mailto:douging@metrogroupcan.com)



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**Tower Renewal Waste Diversion:  
the need and the challenge**

- Toronto multi-residential divert 38%
- Toronto single-family dwellings divert 63%
- Toronto multi-residential represent half of the households in Toronto
- Toronto has a goal to divert 70%
- With half Toronto's residential waste coming from multi-residential and with multi-residential diversion being so low, this presents a tremendous opportunity — as well as a challenge!



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**Tower Renewal Waste Diversion:  
the financial savings**

- The City of Toronto Waste Levy program rewards and supports diversion by providing free recycling collection and other diversion programs (E.g. green bin, E-waste, bulky items, etc)
- Simply stated: in the City of Toronto reducing waste saves money  
In some cases, it saves a lot of money



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## The Pilot Project

WHEN	WHAT	ACTIVITIES
July and August 2011	Identify the 10 Pilot Buildings	<ul style="list-style-type: none"> <li>Looked for diversity (ownership, structural, demographic)</li> <li>Commitment Letters</li> </ul>
August and September 2011	Review existing conditions of 10 Pilot Buildings	<ul style="list-style-type: none"> <li>Questionnaires</li> <li>Site Visits</li> <li>City Records</li> <li>Waste Audits (pre-implementation)</li> </ul>
September-October 2011	Identification of Waste Diversion Strategies	<ul style="list-style-type: none"> <li>Workshop</li> <li>Consultant meetings with Pilot Tower Teams</li> </ul>
November 2011 - March 2012	Implementation and Monitoring	<ul style="list-style-type: none"> <li>Implement strategies</li> <li>Feedback and troubleshooting</li> </ul>
April-May 2012	Collect and analyze results	<ul style="list-style-type: none"> <li>Waste Audits (post-implementation)</li> <li>Questionnaires</li> </ul>



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## The 10 Pilot Towers: Geographic Diversity



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## The 10 Pilot Towers: Structural and Demographic Diversity

Pilot Building	# of Floors	Years of Use	Waste Diversion Rate	Ownership	Structure	Building Type	Operating Hours	Demographic	Waste Type
881 Dundas West	14	1950	11	0.15	Comm	Ind	24/7	Industrial	Mixed waste of all kinds
1000 Dundas West	20	1970	11	0.20	Comm	Ind	24/7	Industrial	Mixed waste of all kinds
1000 Dundas West	17	1950	11	0.17	Comm	Ind	24/7	Industrial	Mixed waste of all kinds
1000 Dundas West	17	1950	11	0.17	Comm	Ind	24/7	Industrial	Mixed waste of all kinds
1000 Dundas West	17	1950	11	0.17	Comm	Ind	24/7	Industrial	Mixed waste of all kinds
1000 Dundas West	17	1950	11	0.17	Comm	Ind	24/7	Industrial	Mixed waste of all kinds
1000 Dundas West	17	1950	11	0.17	Comm	Ind	24/7	Industrial	Mixed waste of all kinds
1000 Dundas West	17	1950	11	0.17	Comm	Ind	24/7	Industrial	Mixed waste of all kinds
1000 Dundas West	17	1950	11	0.17	Comm	Ind	24/7	Industrial	Mixed waste of all kinds
1000 Dundas West	17	1950	11	0.17	Comm	Ind	24/7	Industrial	Mixed waste of all kinds



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## City of Toronto Waste Diversion Programs

- Speaker: Dan Smit, Supervisor Contracted Services, City of Toronto



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## City of Toronto 3R's Ambassador's Program

- Speaker: Charlotte Ueta, 3R's Ambassador Coordinator, City of Toronto



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## Waste Diversion Strategies

Strategies will fall into one of the following categories:

### Program Strategies:

- Retrofit Solutions
- Operational Adjustments

### Supportive Strategies:

- Financial Tools & Incentives
- Communications and Outreach



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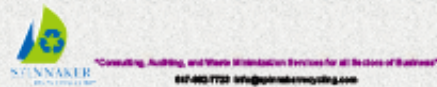
## Waste Diversion Strategy Selection

- Strategy recommendation & selection will be driven by audit results keeping structural and demographic factors in mind
- Example: Waste stream data (by weight) at one pilot building:



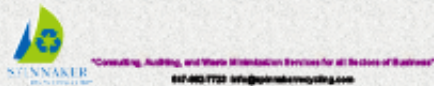
## Strategies: Retrofit Solutions

- Speaker: Doug King, Metro Group
- Strategies include:
  1. External chutes
  2. Tri-Sorters
  3. Green bins
  4. Staff Management



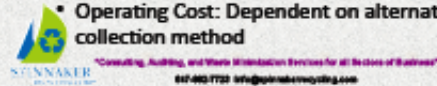
## Strategies: Operational Adjustments

- Operational adjustments fall into one of the following categories:
  1. Chute closures & designated chute times
  2. Container and compactor optimization
  3. Recycling collection



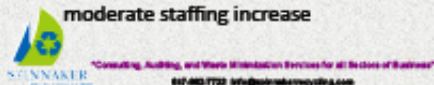
## Strategies: Operational Adjustments 1a. Chute Closures

- Temporary or permanent
- Must obtain approval from the City-GM for Solid Waste
- Requires follow City chute closure procedure which requires majority tenant voting in favor
- Capital Cost: Low
- Operating Cost: Dependent on alternative collection method



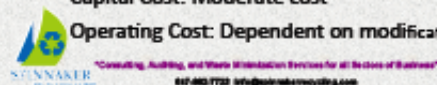
## Strategies: Operational Adjustments 1b. Designated Chute Times

- Time windows for recycling only
- Typically called for when: have non-compacted chute system or have approval for compacted recycling system
- Capital Cost: Low
- Operating Cost: Moderate cost increase and moderate staffing increase



## Strategies: Operational Adjustments: 2a. Container Optimization

- Review and adjust the number, size, type and location of waste and recycling containers
- Typically called for: in buildings where waste is not compacted and in all buildings where recyclables are containerized
- Capital Cost: Moderate cost
- Operating Cost: Dependent on modification





## Strategies: Operational Adjustments: 2b. Compactor Optimization

- Typically called for when compacted waste containers are not efficiently loaded and/or monitored or when equipment is no longer suitable
- Capital Cost: Dependent on issue and recommendation
- Operating Cost: Low



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## Strategies: Operational Adjustments 3. Recycling Collection

### Door-to-Door

- Go door-to-door collecting recyclables on set schedule
- Typically called for: in smaller buildings that are well staffed and/or have high volunteerism
- Capital Cost: None
- Operating Cost: Significant increase in staffing

### Floor-to-Floor

- Use of chute rooms for collecting recyclables
- Typically called for: in buildings with chute rooms of sufficient size
- Capital Cost: Minimal
- Operating Cost: Significant (clean chute rooms 2xce/day)



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## Supportive Strategies: Financial Tools & Incentives

- Typically called for when: waste diversion strategies require significant personal investment and are expected to realize real financial savings to the building
- Examples:
  - "Staff Incentives" tie savings in waste disposal bill to a financially-based bonus system for staff members involved in waste management activities
  - "Tenant Incentives &/or Tenant Pledges" motivate tenants with awards or gain investment via pledges
  - "Community Incentives" use some portion of savings in waste disposal to provide a community-based award (Ex. Area beautification project)
- Capital Cost: Dependent on tool structure
- Operating Cost: Dependent on tool structure



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## Supportive Strategies: Communications & Outreach

- Communications and outreach strategies will fall into one of the following categories:
  - Signage & Flyers
  - Door-to-Door
  - 3R's Ambassador Program (covered earlier)
  - Waste Days/Environment Days/Events
  - Partnership with community programs
  - Use of Internet



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## Strategies: Communications & Outreach: 1. Signage & Flyers

Typically called for when: want to enhance or promote a waste diversion program or program strategy

### Signage

- Static for high traffic areas
- Capital Cost: Low
- Operating Cost: Low staff increase

### Flyers

- Best with door-to-door delivery
- Capital Cost: Low
- Operating Cost: Dependent on how flyers distributed (static vs dynamic)



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## Strategies: Communications & Outreach: 2. Door-to-door

- Go door-to-door speaking with tenants and distributing flyers, communications material
- Typically called for when: want to enhance or promote a waste diversion program or program strategy
- Capital Cost: Low
- Operating Cost: Temporary significant increase in staffing



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### Strategies: Communications & Outreach: 3. 3R's Ambassador Program

- Previously covered by Charlotte Ueta, City of Toronto
- None of the Pilot Tower buildings have a 3R's Ambassador
- Suitable at all buildings, however ideally suited when implementing strategies with high staffing demands
- Capital Cost: None
- Operating Cost: None



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### Strategies: Communications & Outreach: 4. Eco-Events, Environment Days

- Staffing a table and/or making a presentation at local community-based events
- Examples: Community BBQs, Community Fairs, Earth Day, Environment Day
- Typically called for when: want to enhance or promote a waste diversion program or program strategy
- Capital Cost: Low to medium (outsource staffing)
- Operating Cost: Low



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### Strategies: Communications & Outreach: 5. Partnership with Community Programs

- Need to identify community programs with possible tie-ins
- Typically called for when: want to enhance or promote a waste diversion program or program strategy in conjunction
- Capital Cost: Low
- Operating Cost: Low to moderate increase in staffing



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### Strategies: Communications & Outreach: 6. Use of Internet

- Facebook - Name = "Street address" or other mechanism (blog, google-plus, private network)
- Post the FB address thru flyers/posters in the building
- Benefits:
  - Provide education on timing, nature of program strategies
  - Get feedback on how the program strategies are working - respond
  - Get buy-in from the residents
  - Get volunteers to support the program
- Content may include:
  - Education/training on waste diversion program
  - Barometers of performance (waste/unit)
  - Waste audit results
  - Get feedback



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### Strategies: Communications & Outreach: 6. Use of Internet – FB Example



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### Next Steps

1. Spinnaker Recycling to complete the waste audits at remaining 6 buildings
2. Pilot Tower Teams to meet with Spinnaker Recycling to discuss potential strategies for implementation
3. Come to an agreement and implement the selected strategies
4. Stay connected on Facebook/other – provide feedback and comments, look to the other teams internet sites and learn from each teams challenges and successes



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## E) Specific Waste Categories Definitions

The following defines waste categories by their components:

### **Aerosol Cans**

### **Aluminum Cans**

Beverage cans

### **Aluminum Foil**

Aluminum food wrapping

### **Batteries**

Dry cell batteries

### **Beverage Glass**

Glass beverage bottlers

### **Beverage Cans**

### **Bottled Shampoo**

Resort Shampoo, Conditioner Bottles & Residuals

### **Boxboard**

Part boxes  
Wipe boxes  
Carrier stock

### **Cardboard**

Old Corrugated Cardboard

### **Ceramics**

Dining Plates

### **Coffee Grounds**

Spent Coffee Grounds

### **Diapers**

Disposable diapers (used and unused)

### **Electronic Waste**

Electronic equipment  
Computer parts  
Printers  
Fax Machines  
Cell Phones  
Other "listed" waste electrical and electronic equipment

### **Foam Packaging**

Polystyrene packaging  
Polystyrene dividers & sheets

### **Food Packaging**

Single serving unrecyclable packaging  
Condiment packages  
Paper food wrappers

### **Food Waste**

Organics

### **Glassware**

Beverage Glasses

### **HDPE**

High-density polyethylene (HDPE)  
Plastic jugs – (solvents, chemicals etc...)  
#2 food containers

### **Kraft Paper**

Recyclable brown paper packaging

### **LDPE**

Low-density polyethylene  
Clear recyclable plastic bags & film

### **Maintenance Waste**

Cleaning equipment  
Pipes  
Fixtures  
Ceiling tiles  
Rubber tubing  
Etc...

### **Metal**

Mixed metals  
Paint tins & lids  
Screws & bolts  
Maintenance metals

### **Metal Cans**

Food containers

### **Milk Cartons**

Paper Cartons  
Milk & juice cartons

**Molded Paper**

Paper “take-out” trays  
Coffee trays  
Egg cartons

**Newsprint**

Old newspapers (ONP)

**Nitrile Gloves**

Latex style gloves

**Non-Recyclable Paper**

Adhesive labels and label stock  
Label backings  
Coated stock

**Organics**

Leftovers  
Coffee grounds  
Unconsumed portions  
Stale dated food

**Padded Envelopes**

Protective envelopes & shipping pouches

**Paper**

White ledger  
Computer paper  
Colored  
Carbonless paper  
Envelopes  
Magazines & brochures  
Paper Cups & Plates  
Disposable coffee cups & plates

**Paper Towels**

Bathroom area paper towels  
Napkins

**PET**

Polyethylene terephthalate  
Plastic bottles

**Plastic Strapping**

Plastic strapping

**Plastic Films**

Garbage bags  
Plastic shopping bags  
Mixed multi-polymer films  
Sandwich bags  
Plastic wrappers

**Plastics (Misc)**

Mixed plastics  
Tubing  
Polyvinyl chloride (PVC)  
Plastic & Metal Composite

**Polystyrene Foam**

Polystyrene foam  
Coffee Cups  
Foam food packaging

**Polystyrene Tray**

Polystyrene tray food packages  
Plastic cutlery and plates

**Polypro-food**

Polypropylene food containers  
Yogurt and margarine containers

**Rags****Rubber Gloves**

Thick rubber work gloves

**Soap Bars****Sweepings/Dirt****Tape**

Adhesive packing tape

**Tetrapaks**

Aseptic packaging

**Toner Cartridges**



## F) Pre- and Post-Implementation Waste Audit Tables – Specific Waste Category

Location 1	
Pre-Implementation	Percent
Organics	69.65
Paper Towels	3.77
<b>Total Organics</b>	<b>73.42</b>
Plastic Bags	3.66
Plastic Bottles/Jugs/Tubs/Lids	3.26
Plastics (Misc)	2.21
Paper/Newsprint	2.08
Metal Cans	1.02
Aluminum Cans	1.01
Polystyrene Foam (Food)	0.82
Plastic Bottles (PET)	0.57
Paint Cans	0.52
Cardboard	0.33
Glass	0.31
PS Yogurt Containers	0.11
Milk Cartons	0.11
Al Foil Trays	0.04
<b>Total Recyclables</b>	<b>16.05</b>
Batteries	0.32
<b>Total E-Waste/HSW</b>	<b>0.32</b>
Clothing/Shoes	1.81
<b>Total Donatable</b>	<b>1.81</b>
Waste	5.22
Plastic Films	2.75
Food Packaging	0.44
<b>Total Waste</b>	<b>8.41</b>

Location 1	
Post-Implementation	Percent
Organics	57.27
Paper Towels	7.85
Diapers	9.91
<b>Total Organics</b>	<b>75.03</b>
Plastic Bags	0.57
Plastic Bottles/Jugs/Tubs/Lids	1.04
Plastics (Misc)	0.08
Paper/Newsprint	5.33
Metal Cans	0.77
Aluminum Cans	0.29
Polystyrene Foam (Food)	0.71
Plastic Bottles (PET)	0.80
Paper cup/plates	0.19
Molded paper	0.19
Kraft Paper	0.09
Cardboard	0.31
Glass	1.81
PS Yogurt Containers	0.16
Boxboard	2.11
Milk Cartons	0.35
Aerosol Cans	0.32
<b>Total Recyclables</b>	<b>15.11</b>
<b>Total E-Waste/HSW</b>	<b>0.00</b>
Clothing/Shoes	0.63
<b>Total Donatable</b>	<b>0.63</b>
Waste	5.38
Plastic Films	1.96
Food Packaging	1.89
<b>Total Waste</b>	<b>9.23</b>

Location 2	
Pre-Implementation	Percent
Organics	34.56
Diapers	13.76
Paper Towels	11.56
Paper Cups/Plates	0.20
<b>Total Organics</b>	<b>60.07</b>
Paper	2.76
Plastic Bags	2.20
Beverage Glass	1.35
Plastic Bottles/Jugs/Tubs/Lids	1.19
Boxboard	1.13
Metal Cans	0.74
Plastic Bottles (PET)	0.57
Polystyrene Cutlery/Lids	0.48
Kraft Paper	0.34
Aluminum Cans	0.21
PS Yogurt Containers	0.18
Milk Cartons	0.15
Newsprint	0.11
Al Foil Trays	0.02
<b>Total Recyclable</b>	<b>11.42</b>
Batteries	0.04
<b>Total E-Waste/HSW</b>	<b>0.04</b>
Clothing/Shoes	2.76
<b>Total Donatable</b>	<b>2.76</b>
Waste	6.17
Bulky Waste	6.28
Paper Shopping Bags	0.95
Aluminum Foil	0.48
Plastic Films	4.76
Food Packaging	3.77
Molded Plastic FP	3.31
<b>Total Waste</b>	<b>25.71</b>

Location 2	
Post-Implementation	Percent
Organics	32.08
Diapers	2.61
Paper Towels	13.30
Paper Cups/Plates	0.00
<b>Total Organics</b>	<b>47.99</b>
Mixed Paper/Shredded paper	4.32
Plastic Bottles (PET)	1.35
Glass	1.50
Plastic Bottles/Jugs/Tubs/Lids	3.80
Polystyrene Foam	0.91
Kraft Paper	0.72
Cardboard	0.39
Aluminum Cans	0.08
Paper cups/plates	0.80
PS Yogurt Containers	0.16
Milk Cartons	0.08
Newsprint	1.06
Aseptic Polycoat	0.13
<b>Total Recyclable</b>	<b>15.29</b>
<b>Total E-Waste/HSW</b>	<b>0.00</b>
Clothing/Shoes	1.79
<b>Total Donatable</b>	<b>1.79</b>
Waste	14.59
Plastic Bags	9.50
Aluminum Foil	1.35
Plastic Films	4.76
Food Packaging	4.73
<b>Total Waste</b>	<b>34.93</b>



Location 3	
Pre-Implementation	Percent
Organics	40.97
Diapers	4.48
Paper Towels	4.25
Paper Cups/Plates	0.35
<b>Total Organics</b>	<b>50.04</b>
Paper/Newsprint	7.70
Boxboard	4.05
Cardboard	3.49
Metal Cans	3.11
Plastic Bottles (PET)	2.39
Plastic Bottles/Jugs/Tubs/Lids	2.17
Milk Cartons	1.05
Fibre Cores	0.64
Beverage Glass	0.62
Molded Paper	0.60
Polystyrene Foam (Food)	0.56
Aerosol Cans	0.47
Kraft Paper	0.31
Aluminum Cans	0.20
PS Yogurt Containers	0.10
Aseptic Polycoat	0.09
<b>Total Recyclable</b>	<b>27.55</b>
Batteries	0.17
<b>Total E-Waste/HSW</b>	<b>0.17</b>
Clothing/Shoes	4.92
<b>Total Donatable</b>	<b>4.92</b>
Plastic Films	2.37
Waste	6.11
Molded Plastic FP	1.78
Food Packaging	4.19
Maintenance Waste	1.71
Garbage Bags	1.11
Other Pack Foams	0.06
<b>Total Waste</b>	<b>17.31</b>

Location 3	
Post-Implementation	Percent
Organics	49.19%
Diapers	4.66%
Paper Towels	1.58%
<b>Total Organics</b>	<b>55.43%</b>
Paper/Newsprint	8.87%
Boxboard	2.15%
Cardboard	1.54%
Metal Cans	0.53%
Plastic Bottles (PET)	0.99%
Plastic Bottles/Jugs/Tubs/Lids	4.32%
Milk Cartons	0.24%
Fibre Cores	0.00%
Beverage Glass	1.38%
Molded Paper	0.36%
Polystyrene Foam (Food)	0.22%
Aerosol Cans	0.77%
Aluminum Cans	0.38%
PS Yogurt Containers	0.04%
Paper cups	0.10%
Aseptic Polycoat	0.20%
<b>Total Recyclable</b>	<b>22.10%</b>
Batteries	0.20%
<b>Total E-Waste/HSW</b>	<b>0.20%</b>
Clothing/Shoes	2.78%
<b>Total Donatable</b>	<b>2.78%</b>
Plastic Films	1.01%
Waste	9.70%
Molded Plastic FP	0.16%
Food Packaging	2.84%
Maintenance Waste	4.48%
Garbage Bags	0.97%
Aluminum Foil	0.32%
<b>Total Waste</b>	<b>19.49%</b>

Location 4	
Pre-Implementation	Percent
Organics	50.41
Diapers	18.50
Paper Towels	1.74
<b>Total Organics</b>	<b>70.66</b>
Newsprint	5.05
Paper	3.47
Metal Cans	3.27
Boxboard	2.98
Plastic Bottles (PET)	1.38
Beverage Glass	1.12
Plastic Bottles/Jugs/Tubs/Lids	0.93
Aerosol Cans	0.73
Aluminum Cans	0.63
Kraft Paper	0.49
Aseptic Polycoat	0.44
Polystyrene Foam (Food)	0.40
Cardboard	0.13
Foam Packaging	0.11
Milk Cartons	0.10
Al Foil Trays	0.07
Molded Paper	0.06
PS Yogurt Containers	0.06
<b>Total Recyclable</b>	<b>21.43</b>
Batteries	0.05
eWaste	0.38
<b>Total E-Waste/HSW</b>	<b>0.43</b>
Clothing/Shoes	3.04
<b>Total Donatable</b>	<b>3.04</b>
Waste	1.26
Aluminum Foil	0.05
Food Packaging	1.41
Garbage Bags	0.93
Molded Plastic FP	0.78
<b>Total Waste</b>	<b>4.44</b>

Location 4	
Post-Implementation	Percent
Organics	36.51%
Diapers	7.47%
Paper Towels	3.21%
<b>Total Organics</b>	<b>47.20%</b>
Newsprint	6.23%
Paper	2.93%
Metal Cans	3.29%
Boxboard	7.69%
Plastic Bottles (PET)	2.02%
Beverage Glass	2.52%
Plastic Bottles/Jugs/Tubs/Lids	1.70%
Aerosol Cans	0.56%
Aluminum Cans	1.54%
Kraft Paper	0.48%
Paper cups	0.18%
Cardboard	2.20%
Foam Packaging	0.44%
Milk Cartons	0.94%
Molded Paper	0.70%
PS Yogurt Containers	0.36%
<b>Total Recyclable</b>	<b>33.76%</b>
<b>Total E-Waste/HSW</b>	<b>0.00%</b>
Clothing/Shoes	1.70%
<b>Total Donatable</b>	<b>1.70%</b>
Waste	10.28%
Aluminum Foil	0.08%
Food Packaging	4.83%
Garbage Bags	1.94%
Molded Plastic FP	0.22%
<b>Total Waste</b>	<b>17.35%</b>

Location 5 (Control)	
Pre-Implementation	Percent
Organics	53.67
Diapers	7.92
Paper Towels	2.82
Paper Cups/Plates	0.27
<b>Total Organics</b>	<b>64.69</b>
Boxboard	4.29
Newsprint	3.84
Paper	3.64
Plastic Bottles (PET)	2.62
Cardboard	2.57
Metal Cans	2.07
Beverage Glass	1.01
Molded Paper	0.96
Plastic Bottles/Jugs/Tubs/Lids	0.82
Aerosol Cans	0.66
Polystyrene Foam (Food)	0.64
Aluminum Cans	0.57
Aseptic Polycoat	0.32
Milk Cartons	0.24
Kraft Paper	0.13
<b>Total Recyclable</b>	<b>24.37</b>
<b>Total E-Waste/HSW</b>	<b>0.00</b>
Clothing/Shoes	1.21
<b>Total Donatable</b>	<b>1.21</b>
Waste	1.60
Aluminum Foil	0.02
Food Packaging	3.26
Maintenance Waste	1.94
Plastic Films	1.07
Garbage Bags	0.99
Molded Plastic FP	0.85
<b>Total Waste</b>	<b>9.72</b>

Location 5 (Control)	
Post-Implementation	Percent
Organics	48.76%
Diapers	2.59%
Paper Towels	2.91%
Paper Cups/Plates	0.25%
<b>Total Organics</b>	<b>54.51%</b>
Boxboard	5.01%
Newsprint	1.87%
Paper	0.96%
Plastic Bottles (PET)	3.23%
Cardboard	5.62%
Metal Cans	1.40%
Beverage Glass	2.23%
Molded Paper	0.23%
Plastic Bottles/Jugs/Tubs/Lids	2.16%
Aerosol Cans	0.19%
Polystyrene Foam (Food)	0.64%
Aluminum Cans	0.83%
Aseptic Polycoat	0.08%
Milk Cartons	0.21%
Kraft Paper	0.55%
<b>Total Recyclable</b>	<b>25.21%</b>
<b>Total E-Waste/HSW</b>	<b>0.25%</b>
Clothing/Shoes	12.03%
<b>Total Donatable</b>	<b>12.03%</b>
Waste	2.63%
Aluminum Foil	0.30%
Food Packaging	1.53%
Plastic Films	1.49%
Garbage Bags	0.42%
Molded Plastic FP	0.70%
Liquid	0.93%
<b>Total Waste</b>	<b>8.00%</b>

Location 6	
Pre-Implementation	Percent
Organics	33.36
Diapers	12.72
Paper Towels	2.90
Paper Cups/Plates	0.22
<b>Total Organics</b>	<b>49.20</b>
Cardboard	5.20
Paper/Newsprint	5.11
Boxboard	4.73
Paper	3.93
Aluminum Cans	2.75
Plastic Bottles/Jugs/Tubs/Lids	2.21
Plastic Bottles (PET)	2.06
Metal Cans	1.61
Milk Cartons	1.19
Plastic Bags	0.97
Beverage Glass	0.90
Kraft Paper	0.79
Polystyrene Foam (Food)	0.63
Al Foil Trays	0.45
Aseptic Polycoat	0.37
Plastics (Misc)	0.28
Molded Paper	0.24
PS Yogurt Containers	0.11
<b>Total Recyclables</b>	<b>33.52</b>
eWaste	6.19
Batteries	0.02
<b>Total E-Waste/HSW</b>	<b>6.21</b>
<b>Total Donatable</b>	<b>0.00</b>
Waste	6.56
Plastic Films	1.94
Food Packaging	1.03
Aluminum Foil	0.52
Molded Plastic FP	1.01
<b>Total Waste</b>	<b>11.07</b>

Location 6	
Post-Implementation	Percent
Organics	38.95%
Diapers	12.54%
Paper Towels	3.20%
Paper Cups/Plates	0.80%
<b>Total Organics</b>	<b>55.48%</b>
Cardboard	2.87%
Newsprint	1.15%
Boxboard	5.53%
Paper	2.66%
Aluminum Cans	0.38%
Plastic Bottles/Jugs/Tubs/Lids	2.91%
Plastic Bottles (PET)	4.16%
Metal Cans	3.62%
Beverage Glass	2.51%
Kraft Paper	0.44%
Polystyrene Foam (Food)	0.75%
Aseptic Polycoat	0.63%
Molded Paper	0.33%
PS Yogurt Containers	0.06%
<b>Total Recyclables</b>	<b>28.00%</b>
Batteries	0.04%
<b>Total E-Waste/HSW</b>	<b>0.04%</b>
Clothing	3.35%
<b>Total Donatable</b>	<b>3.35%</b>
Waste	5.71%
Plastic Films	1.11%
Food Packaging	4.75%
Aluminum Foil	0.44%
Plastic bags	0.73%
Wood	0.38%
<b>Total Waste</b>	<b>13.12%</b>

Location 7	
Pre-Implementation	Percent
Organics	58.05
Paper Towels	3.15
Paper Cups/Plates	0.87
<b>Total Organics</b>	<b>62.08</b>
Paper	5.32
Boxboard	3.19
Metal Cans	3.18
Glass	2.22
Kraft Paper	1.31
Plastic Bags	1.13
Milk Cartons	0.88
Plastic Bottles/Jugs/Tubs/Lids	0.83
Aluminum Cans	0.62
Polystyrene Foam (Food)	0.54
Aseptic Polycoat	0.52
Aerosol Cans	0.48
PS Yogurt Containers	0.44
Plastic Bottles (PET)	0.29
Al Foil Trays	0.24
<b>Total Recyclable</b>	<b>21.20</b>
<b>Total E-Waste/HSW</b>	<b>0.00</b>
Clothing/Shoes	3.15
<b>Total Donatable</b>	<b>3.15</b>
Food Packaging	4.19
Waste	4.18
Plastic Films	2.52
Molded Plastic FP	2.68
<b>Total Waste</b>	<b>13.58</b>

Location 7	
Post-Implementation	Percent
Organics	49.59%
Paper Towels	1.23%
Cat Litter	9.60%
Diapers/Sanitary	3.12%
<b>Total Organics</b>	<b>63.55%</b>
Paper	6.67%
Boxboard	1.71%
Metal Cans	0.91%
Glass	1.58%
Kraft Paper	0.30%
Plastic Bags	2.03%
Milk Cartons	0.38%
Plastic Bottles/Jugs/Tubs/Lids	1.97%
Aluminum Cans	0.61%
Polystyrene Foam (Food)	0.48%
Aseptic Polycoat	0.06%
PS Yogurt Containers	0.12%
Plastic Bottles (PET)	0.66%
Al Foil Trays	0.03%
Cardboard	0.61%
<b>Total Recyclable</b>	<b>18.11%</b>
Ewaste/batteries	0.03%
<b>Total E-Waste/HSW</b>	<b>0.03%</b>
Clothing/shoes	0.92%
<b>Total Donatable</b>	<b>0.92%</b>
Food Packaging	3.11%
Waste	12.67%
Plastic Films	1.62%
<b>Total Waste</b>	<b>17.39%</b>

Location 8	
Pre-Implementation	Percent
Organics	49.09
Diapers	10.51
Paper Towels	4.37
<b>Total Organics</b>	<b>63.97</b>
Paper/Newsprint	4.90
Boxboard	3.92
Metal Cans	3.36
Plastic Bottles (PET)	2.25
Glass	2.09
Plastic Bottles/Jugs/Tubs/Lids	1.88
Plastic Bags	1.67
Milk Cartons	1.23
Aluminum Cans	1.14
Cardboard	0.94
Polystyrene Foam (Food)	0.80
Aseptic Polycoat	0.63
Kraft Paper	0.23
Aerosol Cans	0.16
Polystyrene Cutlery/Lids	0.14
Plastics (Misc)	0.10
<b>Total Recyclable</b>	<b>25.45</b>
Batteries	0.05
<b>Total E-Waste/HSW</b>	<b>0.05</b>
Clothing/Shoes	2.24
<b>Total Donatable</b>	<b>2.24</b>
Waste	1.60
Plastic Films	2.06
Garbage Bags	1.15
Food Packaging	2.87
Molded Plastic FP	0.60
<b>Total Waste</b>	<b>8.28</b>

Location 8	
Post-Implementation	Percent
Organics	37.54%
Diapers	11.26%
Paper Towels	7.50%
<b>Total Organics</b>	<b>56.30%</b>
Paper/Newsprint	1.89%
Boxboard	5.97%
Metal Cans	1.21%
Glass	0.11%
Plastic Bottles/Jugs/Tubs/Lids	6.69%
Plastic Bags	1.10%
Milk Cartons	0.13%
Aluminum Cans	0.55%
Cardboard	0.93%
Polystyrene Foam (Food)	0.59%
Aseptic Polycoat	0.57%
Kraft Paper	0.15%
Aerosol Cans	0.34%
<b>Total Recyclable</b>	<b>20.22%</b>
<b>Total E-Waste/HSW</b>	<b>0.00%</b>
Clothing/Shoes	14.10%
<b>Total Donatable</b>	<b>14.10%</b>
Waste	6.35%
Plastic Films	1.23%
Food Packaging	1.49%
Aluminum Foil	0.30%
<b>Total Waste</b>	<b>9.37%</b>

Location 9	
Pre-Implementation	Percent
Organics	50.39
Paper Towels	6.53
Paper Cups/Plates	0.48
<b>Total Organics</b>	<b>57.40</b>
Boxboard	7.76
Paper/Newsprint	5.97
Cardboard	3.81
Glass	3.05
Metal Cans	1.68
Milk Cartons	1.39
Plastic Bottles (PET)	1.17
Plastic Bottles/Jugs/Tubs/Lids	1.10
Plastic Bags	1.06
Aluminum Cans	0.87
Molded Plastic FP	0.72
Plastics (Misc)	0.59
Aseptic Polycoat	0.48
Kraft Paper	0.40
Molded Paper	0.40
PS Yogurt Containers	0.38
Polystyrene Foam (Food)	0.29
Al Foil Trays	0.19
Polystyrene Cutlery/Lids	0.09
<b>Total Recyclable</b>	<b>31.39</b>
eWaste	1.76
Haz-Mat	0.29
<b>Total E-Waste/HSW</b>	<b>2.05</b>
Clothing/Shoes	1.00
<b>Total Donatable</b>	<b>1.00</b>
Waste	1.50
Food Packaging	4.28
Plastic Films	1.86
Garbage Bags	0.53
<b>Total Waste</b>	<b>8.17</b>

Location 9	
Post-Implementation	Percent
Organics	28.92%
<b>Total Organics</b>	<b>28.92%</b>
Boxboard	2.46%
Paper/Newsprint	8.23%
Cardboard	0.88%
Glass	2.10%
Metal Cans	5.72%
Milk Cartons	0.47%
Plastic Bottles (PET)	0.98%
Plastic Bottles/Jugs/Tubs/Lids	5.56%
Plastic Bags	3.70%
Aluminum Cans	0.85%
Aseptic Polycoat	0.44%
Kraft Paper	0.41%
Molded Paper	0.83%
PS Yogurt Containers	0.54%
Polystyrene Cutlery/Lids	0.23%
<b>Total Recyclable</b>	<b>33.39%</b>
eWaste	0.10%
<b>Total E-Waste/HSW</b>	<b>0.10%</b>
Clothing/Shoes	5.33%
<b>Total Donatable</b>	<b>5.33%</b>
Waste	4.11%
Food Packaging	1.86%
Maintenance Waste	24.86%
Wood	0.31%
Plastic Films	1.11%
<b>Total Waste</b>	<b>32.26%</b>

Location 10	
Pre-Implementation	Percent
Organics	53.17
Paper Towels	3.36
Diapers	2.38
Paper Cups/Plates	0.12
<b>Total Organics</b>	<b>59.03</b>
Beverage Glass	3.96
Paper	2.05
Newsprint	1.87
Aluminum Cans	1.78
Boxboard	1.53
Metal Cans	1.26
Plastic Bottles/Jugs/Tubs/Lids	0.87
Plastic Bottles (PET)	0.81
Aerosol Cans	0.67
Polystyrene Foam (Food)	0.59
Aseptic Polycoat	0.42
Kraft Paper	0.33
Molded Paper	0.22
Milk Cartons	0.13
Al Foil Trays	0.10
Cardboard	0.03
<b>Total Recyclable</b>	<b>16.62</b>
eWaste	0.44
Batteries	0.62
<b>Total E-Waste/HSW</b>	<b>1.06</b>
Clothing/Shoes	8.14
<b>Total Donatable</b>	<b>8.14</b>
Waste	4.98
Plastic Films	1.66
Food Packaging	2.87
Molded Plastic FP	1.54
Garbage Bags	0.50
Wood	3.34
Aluminum Foil	0.26
<b>Total Waste</b>	<b>15.15</b>

Location 10	
Post-Implementation	Percent
Organics	43.53%
Paper Towels	2.41%
Diapers	3.08%
Paper Cups/Plates	0.06%
Pet waste	5.26%
<b>Total Organics</b>	<b>54.33%</b>
Beverage Glass	3.85%
Paper	0.58%
Newsprint	2.36%
Aluminum Cans	0.56%
Boxboard	2.34%
Metal Cans	1.34%
Plastic Bottles/Jugs/Tubs/Lids	1.36%
Plastic Bottles (PET)	1.70%
Aerosol Cans	0.09%
Polystyrene Foam (Food)	0.14%
Aseptic Polycoat	0.21%
Kraft Paper	0.43%
Al Foil Trays	0.07%
Cardboard	0.52%
<b>Total Recyclable</b>	<b>15.54%</b>
eWaste	0.27%
<b>Total E-Waste/HSW</b>	<b>0.27%</b>
Clothing/Shoes	0.10%
<b>Total Donatable</b>	<b>0.10%</b>
Waste	4.28%
Outside/contractor waste	15.02%
Plastic Films	1.08%
Food Packaging	1.49%
Plastic bags	0.49%
Curtains	7.39%
<b>Total Waste</b>	<b>29.75%</b>



## G) Waste Diversion Strategy Recommendations

<b>LOCATION #1: WASTE DIVERSION STRATEGY RECOMMENDATION</b>		
		<b><u>Cost Estimate</u></b>
<b>1)</b>	<b><u>Implement organics program.</u></b> Purchase smaller collection totes for organics and place in parking garage and at rear entrance where ewaste containers are currently located. The materials would need to be collected by staff and transferred to a front end container. The front end container could be stored in the compactor room until an enclosure is built.	\$2,000 (\$1400.00 front end organics container; \$500 for 10 totes)
<b>2)</b>	<b><u>Staff incentive program</u></b> Encourage staff to promote and participate in the diversion programs. When the organics program is implemented, the Tower will likely go from twice per week to once per week service on the waste container: a savings of up to \$75/week. Implement a monthly staff bonus program tied to waste service reduction.	Program dependent but ensure costs covered by waste disposal savings. Recommend \$50/month bonus.
<b>3)</b>	<b><u>3R's Ambassador Program.</u></b> Identify potential Ambassadors within the building and approach for training. 3R's Ambassador could consider a volunteerism/community rewards program to assist the elderly, physically challenged or larger families with small children participate in the recycling and organics collection program.	<\$500.00
<b>4)</b>	<b><u>Flyer and Education Program.</u></b> In addition to using flyers and signage to launch the organics program (1, above), use flyers and signage to enhance existing programs such as recycling. Over half of the recyclables in the waste stream is plastic; plastics make up 11% of the waste stream at this Tower. Post the City of Toronto flyers in all chute rooms, common areas, and collection units to promote the single stream programs.	no charge
<b>4)</b>	<b><u>Communications - Facebook</u></b> - Use Facebook to engage the younger population and spread the word of the new and improved waste diversion strategies including: organic collection, E-waste, and charitable donation collection. 3R's Ambassador may also find it useful to promote waste diversion activities and soliciting volunteers for the Door-to-Door collection service.	no charge



<b>LOCATION #2: WASTE DIVERSION STRATEGY RECOMMENDATION</b>		
		<b><u>Cost Estimate</u></b>
<b>1)</b>	<b><u>Implement Floor to Floor Collection of Organics</u></b> Install 12 gallon organics containers in chute rooms to make it more convenient for residents to dispose of organics.	\$20.00 per container
<b>2)</b>	<b><u>Enhance Floor to Floor Collection of Recyclable Material</u></b> Install 12 gallon organics containers in chute rooms to make it more convenient for residents to dispose of organics. Increase capacity for recyclable material collection by using taller blue boxes.	\$20.00 per container
<b>3)</b>	<b><u>Door to Door Collection of Donatable, E-Waste/HSW</u></b> Collection of donatable, ewaste and hsw could be done by 3R's Ambassadors on a monthly/quarterly or "special event" basis to ensure these items are not disposed of incorrectly.	no charge
<b>4)</b>	<b><u>3R's Ambassador Program.</u></b> This building has highschool volunteers being trained to be 3Rs Ambassadors. These Ambassadors could develop a program to assist the elderly and the physically challenged participate in the recycling and organics collection program, assist in the implementation of door-to-door collection (item 3, above), implement a new tenant "pledge" and assist in waste diversion communications.	no charge
<b>5)</b>	<b><u>Communications - Facebook</u></b> - Use Facebook to engage the younger population and spread the word of the existing diversion strategies. 3R's ambassadors may also find it useful to promote the program and solicit volunteers for the door to door collection service.	no charge

<b>LOCATION #3: WASTE DIVERSION STRATEGY RECOMMENDATION</b>		
		<b><u>Cost Estimate</u></b>
<b>1)</b>	<b><u>Floor by Floor Collection</u></b> - the chute rooms are large enough to accommodate both organic and recycling collection. Tenants would continue to deposit waste in the chute and would place organics and recyclable material in dedicated containers in the chute room for collection by staff. Staff would transfer this material to the containers placed outside in the enclosure. The organics program has been in place since January 2011 but 50% of waste material audited was green bin material and almost 28% recyclable material. These diversion programs suffer from low participation. Diversion will be increased by making diversion activities as convenient as waste disposal.	Increase in staffing hours. Could be financed by increased diversion and decrease in waste disposal costs.
<b>2)</b>	<b><u>Indoor Recycling Area</u></b> With appropriate modifications, the compactor room could be used as an indoor recycling area. Placing an organics and recycling container in this area would make the diversion programs more convenient for tenants. This strategy, if implemented, would also support additional diversion programs such as E-waste collection.	Dependant on quote from contractor
<b>3)</b>	<b><u>Tri-Sorter Installation</u></b> - the compactor room is of adequate dimensions to support the installation of a tri-sorter. Install a complete retrofitted tri-sorter system with three stream collection system for waste, organics and recyclable material. Floor by floor controls with complete lock-out system on chute doors will be required for proper operation and to minimize contamination.	Approx. \$10,000 for trisorter and additional \$600 per floor for panel install. Extra for new chute doors if required.
<b>4)</b>	<b><u>Container Optimization</u></b> - Should strategies 1-3 not be implemented, the outside enclosure for existing recycling and organics containers must be updated. The containers are difficult to access inside the enclosure: the bins have slots but the lids are closed which makes it difficult to deposit larger items. Smaller, low profile containers with lower fence height, or access holes in the fence might be considered. Enclosure area requires updated signage. Recyclable material containers should be painted blue and labelled properly with up to date materials listings. Ensure that at least 18 cubic yards of recycling capacity is available to the building.	\$1200-\$1400 per container.

5)	<b><u>3Rs Ambassador</u></b> - Implement the City program by first identifying interested resident volunteers to help people living in the Tower divert more waste. Ambassadors could be engaged to: 1) assist elderly and physically challenged by establishing a door-to-door collection, 2) identify and establish a program/event to divert more donatable clothing/items (exchanges, etc), 3) establish other event-based diversion activities.	no charge
6)	<b><u>Communications - Facebook</u></b> - Use Facebook to engage the younger population and spread the word of the enhanced and new waste diversion strategies including, ewaste.	no cost initially, managed services are available for a charge, or 3R's volunteer might be considered to manage the page.

<b>LOCATION #4: WASTE DIVERSION STRATEGY RECOMMENDATION</b>		
		<b><u>Cost Estimate</u></b>
<b>1)</b>	<b><u>External Chute(s)</u></b> With the exposed facing at the east end of the property via the stairwell, and the room to construct a pad with easy access to the collection area this option should be considered. A single chute for either green bin or blue box materials, or a dual chute for both are possible options.	Approximately \$15,000-30,000 for the chute/door system plus construction costs/cladding.
<b>2)</b>	<b><u>Container Optimization</u></b> Containers for recycling should be placed as close to the building as possible, in the enclosure if necessary. Containers should be painted blue and labelled properly with up to date materials listings. Use of smaller (3-4yd towable) recycling containers in centralized location in garage may provide a better indoor location for many residents.B44	Labels - no charge from City. Painting of containers approx. \$200 each. 3-4yd front-load bins \$1200-1400 each.
<b>3)</b>	<b><u>Floor by Floor collection</u></b> Renovate storage lockers to accommodate recycling collection on each floor. A floor by floor staff managed recycling (and possibly organics) program is possible.	Quote required for construction costs. blue boxes and small green bin receptacles for each floor approx \$100 per floor.
<b>4)</b>	<b><u>Flyers &amp; Signage</u></b> Posting of current consistent signage in all common areas inside the building and collection points, including chute rooms. Distribution of in-suite receptacles for recycling and marketing materials. Use of fenced enclosure for posting of detailed waste management instructions.	Acrylic holders (\$20 each). Stickers - \$1. Printing costs - variable, but copies from City are at no charge.
<b>5)</b>	<b><u>3R's Ambassador Program</u></b> Implement the City program, by first identifying interested resident volunteers to help people living in the Tower divert more of their waste. Ambassadors could be engaged to assist in the implementation of the selected waste diversion strategies (in particular, strategies 1, 3 and 6).	no charge

6)	<b><u>Communications - Facebook</u></b> - Use Facebook to engage the younger population and spread the word of the new waste diversion strategies.	no charge
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<b>LOCATION #5: WASTE DIVERSION STRATEGY RECOMMENDATION</b>		
		<b><u>Cost Estimate</u></b>
<b>1)</b>	<b><u>Implement Organics Program</u></b> Almost 71% of the waste by weight at this building is acceptable for inclusion in the City of Toronto green bin program with 18.5% of the waste being diapers. Purchase a 3 yard organics container for this material and place in the enclosure closest to the building. Obtain in-suite organics bins for distribution (free of charge). Consider providing 12 gallon green bins to families with babies for easier in-suite collection of diapers.	\$1400.00 for a 3 yard organics container. \$20.00 per 12 gallon organic collection unit. The small clam shell in-suite containers are provided free by the City
<b>2)</b>	<b><u>Flyers, Signage &amp; Education</u></b> Labeling: ensure consistent labelling on the recycling containers in the outside enclosure. Signage: post signage promoting all of the diversion programs (recycling and organics) in chute rooms and common areas. Signage will need to be posted and/or distributed in different languages. Implement a standardized welcome program for new tenants that includes: distribution of organics receptacle, tour of collection points acceptable material listings.	less than \$500.00
<b>3)</b>	<b><u>Container Optimization</u></b> There is insufficient capacity for the recycling at this building. The City requires that there be a minimum of 8 yards of recycling capacity per 100 units per week. Presently there is only 12 yards o recycling capacity. Recommend purchasing an additional 2 by 4 yard or one 6 yard container. Bins should be labeled on all sides promoting the single stream program.	\$2500 - \$3000 for 2 additional front end recycling containers
<b>4)</b>	<b><u>Staff Incentive Program</u></b> Staff is currently engaged, but does not have the infrastructure to support existing diversion program. By increasing recycling capacity and implementing an organics program there will be disposal cost savings that could finance a staff incentive program. Implement a monthly staff bonus program tied to waste service reduction.	Program dependent but ensure costs covered by waste disposal savings. Recommend \$50/month bonus.



5)	<b><u>3R's Ambassador Program.</u></b> Identify potential Ambassadors within the building and approach for training. 3R's Ambassador could consider a volunteerism/community rewards program to assist the elderly, physically challenged or larger families with small children participate in the recycling and organics collection program.	<\$500.00
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<b>LOCATION #6: WASTE DIVERSION STRATEGY RECOMMENDATION</b>		
		<b><u>Cost Estimate</u></b>
<b>1)</b>	<b><u>Container Optimization</u></b> - currently residents have access to the waste and recycling enclosure area and residents will occasionally place waste in open recycling containers thereby contaminating the recycling. Prevent residents from accessing this area. Use signage and memos/flyers to direct residents to the correct area for waste and recycling disposal. In addition, partner disposal and recycling containers: provide disposal option in the form of a small waste receptacle alongside blue recycling totes in all areas where recycling contamination occurs; and add recycling containers to laundry room and parking garage and any other areas where only waste receptacles are provided.	\$0-500 equipment
<b>2)</b>	<b><u>Tenant Incentives - Passport</u></b> - since there are no realistic opportunities to make recycling more convenient and since this is largely a family building, it is recommended that in order to enhance the diversion programs that a 'passport' program be implemented. Under this program, each unit is given a passport for stamping each time they deliver a recycling/E-waste to the recycling/E-waste collection area. The honour-system can be engaged when the management office is closed. Each full passport will give the passport holder one entry into a monthly draw for a prize (recommend \$100 gift card/certificate to local retailer, or other prize of similar value). Use postings to announce winners to maintain interest in the passport and diversion programs. Incorporate a "pledge" in the passport program.	\$1200+ annually
<b>3)</b>	<b><u>Signage and education</u></b> - all common collection points (garage, front and rear entry, mail area, laundry) should have signage to indicate acceptable materials for waste, recycling and E-Waste diversion programs. Chute rooms should have acceptable materials listings/stop-signs added, and have the old literature removed. Confirm all residential units have blue bags/bins and acceptable material listing flyers. Implement a standardized welcome program for new tenants that includes: distribution of receptacles, tour of collection points acceptable material listings and signing a pledge.	City printing - free, other materials dependant upon internal marketing capacity. Other materials typically less than \$500

<b>4)</b>	<b><u>E-Waste</u></b> - While there are E-waste boxes on site this program would benefit from the support of a new roll-out, including the advertisement of the program, distribution of e-waste bags to the residents, and inclusion in the passport program (Strategy 2, above).	Costs included in items 2 and 3 above
<b>5)</b>	<b><u>3R's Ambassador Program</u></b> - Implement the City program, by first identifying interested resident volunteers to help people living in the Tower divert more waste. Ambassadors could be engaged to assist in the implementation of waste diversion strategies, assisting elderly and physically-challenged, and other event-based diversion activities.	no charge
<b>6)</b>	<b><u>Communications - Facebook</u></b> - Use Facebook to engage the younger population and spread the word of the new and improved waste diversion strategies including: organic collection, ewaste, and charitable donation collection. 3R's Ambassador may also find it useful to promote waste diversion activities and soliciting volunteers for the Door-to-Door collection service.	no charge

<b>LOCATION #7: WASTE DIVERSION STRATEGY RECOMMENDATION</b>		
		<b><u>Cost Estimate</u></b>
<b>1)</b>	<b><u>Temporary or Permanent Chute closure</u></b> - Lock down the chute rooms and have residents take all of their waste and recycling to containers outside. This will make all disposal/diversion actions equally convenient and, if supported by signage/flyers/education, result in higher diversion rates. An application must be completed and submitted to the City with results of a poll of residents showing 51% of residents support the program. This option, once implemented, could be followed up with the implementation of the City organics and other diversion programs at this building.	<\$300.00
<b>2)</b>	<b><u>Timed chute closure</u></b> - Set specific times in the day or week for disposing of recyclables down the chute making recycling and disposal equally as convenient. 21% of the waste audited was recyclables. Management will need to provide information on the changes to the program via distribution and posting of the changes in common areas. This option requires more staffing and could result in recycling contamination if not well communicated or there is a lack of compliance and willingness. This option does not support the implementation of the City organics or other diversion programs (as strategy 1 does).	Staff time and marketing of program
<b>3)</b>	<b><u>Door to Door Collection</u></b> - Staff to collect recyclables door to door on a weekly scheduled basis. This could be made available to all residents or only ones that require assistance. This option requires more staffing. This option also does not support the implementation of the City organics or other diversion programs (as strategy 1 does).	Staff time and marketing of program
<b>4)</b>	<b><u>Events &amp; Pledges</u></b> - To launch the chosen strategy (strategy 1, 2 or 3), host an environment event in the lobby. Distribute informational flyers and obtain signed environment pledges from the residents. Ensure environment pledges and information on diversion program are included in new tenant orientation package on a go forward basis.	Minor printing costs
<b>5)</b>	<b><u>Communications - Facebook</u></b> - Use Facebook to engage the younger population and spread the word of the new waste diversion strategies.	no charge

<b>LOCATION #8: WASTE DIVERSION STRATEGY RECOMMENDATION</b>		
		<b><u>Cost Estimate</u></b>
<b>1)</b>	<b><u>3Rs Ambassador &amp; Door-to-Door Collection</u></b> - 3R's Ambassador and community groups could consider a volunteerism/community rewards program to assist the elderly, physically-challenged or larger families with small children participate in the recycling and organics collection program.	no charge - contribution from waste budget savings.
<b>2)</b>	<b><u>Staff Incentives</u></b> - staff members at this building seem to be connected to and well known by the residents. It is recommended that this connection be supported by the introduction of an incentive designed to reward performance. This could be tracked by increases in recycling, decreases in waste, or ideally, both. Log sheets should be employed and a baseline of service established in advance of any implementation. Disposal cost savings could finance a staff incentive program.	can be directly linked to decreases in costs from budget/actual. Additional rewards might be considered.
<b>3)</b>	<b><u>Flyers &amp; Signage</u></b> Posting of current consistent signage in all common areas inside the building and collection points, including chute rooms. Distribution of in-suite receptacles for recycling and marketing materials. Use of fenced enclosure for posting of detailed waste management instructions.	Acrylic holders (\$20 each). Stickers - \$1. Printing costs - variable, but copies from City are at no charge.
<b>4)</b>	<b><u>Container Optimization</u></b> Containers for recycling should be placed as close to the building as possible , in the enclosure if necessary. Containers should be painted blue and labelled properly with up to date materials listings. Smaller, low profile containers with lower fence height, or access holes in the fence might be considered and extensive signage added to the enclosure. Ensure that at least 20 cubic yards of recycling capacity is available to the building.	Labels - no charge from City. Painting of containers approx. \$200 each. 3-4yd front-load bins \$1200-1400 each.

5)	<b><u>Communications - Facebook</u></b> - Use Facebook to engage the younger population and spread the word of the new waste diversion strategies.	no cost initially, managed services are available for a charge, or 3R's volunteer might be considered to manage the page.
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<b>LOCATION #9: WASTE DIVERSION STRATEGY RECOMMENDATION</b>		
		<b><u>Cost Estimate</u></b>
<b>1)</b>	<b><u>City Organics Program</u></b> - With the recycling room opened up, the expanded area should be used to collect organic waste (57.4% of current waste stream). The City has a program including flyers and posters to launch the program.	\$1400 per front load container
<b>2)</b>	<b><u>Container Optimization</u></b> -With the recycling room opened up there will be space to support a better area with communication pieces and a broader range of diversion options. Note the need for multiple languages in signage. This should reduce the 31.4% of recyclable material in the waste stream. The area could also be used for E-waste and Donatable collection (1.8% and 1% of waste stream, respectively). Note: some efficiencies are recommended for compactor optimization to reduce waste collection costs which has little impact on waste diversion.	\$1000-5000. Containers are on site, need some painting, maintenance, etc. opening recycling room may require security considerations.
<b>3)</b>	<b><u>3R's Ambassador &amp; Building and Community Rewards</u></b> - This community is active with projects to better cater to the younger population. 3Rs Ambassador program or volunteer program could consider a 'micro-business' under OES (electronics stewardship program). Money saved/made through OES could be put toward a youth-based community project such as providing security staffing to permit the gym to remain open more frequently.	<\$500 and included in above
<b>4)</b>	<b><u>3Rs Ambassador &amp; Door-to-Door Collection</u></b> - 3R's Ambassador could consider a volunteerism/community rewards program to assist the elderly, physically-challenged or larger families with small children participate in the recycling and organics collection program.	<\$500
<b>5)</b>	<b><u>Communications - Facebook</u></b> - Use Facebook to engage the younger population and spread the word of the new waste diversion strategies including: organic collection, E-waste, charitable donation collection, and Community Rewards program. 3Rs Ambassadors may also find it useful to promote waste diversion activities and soliciting Volunteers for the Door-to-Door collection service.	\$0

<b>LOCATION #10: WASTE DIVERSION STRATEGY RECOMMENDATION</b>		
		<b><u>Cost Estimate</u></b>
<b>1)</b>	<b><u>Organics Program - In-Sink Food Disposer</u></b> -This location is an excellent candidate for an in-suite, in-sink food disposer system as an alternate to the City Organics program for the following reasons: i) the waste stream is comprised of 53% food waste and less than 6% 'other' organic waste not suitable for grinding; ii) this location is on a separated sanitary sewer system (not combined with storm and subject to overflows); and iii) the owner/operator of the building (CapReit) is performing several other upgrades to the property.	\$19,250 (\$250 per unit, approx. to CapReit)
<b>2)</b>	<b><u>Floor by Floor Recycling</u></b> - floor by floor laundry rooms with capacity for storing recycling receptacles provide a unique opportunity to provide a more convenient blue box recycling program for the residents. Staff are currently managing waste receptacles within these rooms. E-waste can be similarly picked up floor by floor with this program.	\$15-250 per floor.
<b>3)</b>	<b><u>Container Optimization</u></b> - use of 2 smaller 3yd front-load waste containers in place of the single 6yd container, along with the implementation of a similar, easier to use front-load single stream recycling container is recommended for this site. The actual flow of waste can be measured better with small containers, and costs reduced as volumes picked up actually drop. Front-load recycling service allows for easier collection of larger recyclables such as cardboard boxes.	\$1200+ per container, or less depending upon portfolio inventory.
<b>4)</b>	<b><u>Events/Pledges</u></b> - with small population, low turn-over rates and improvements to the buildings appearance and environmental performance, an annual event is recommended for the building (earth day for example) to collect donatable items for charity as well as other divertable material (E-waste, HSW). Event should be used to educate on waste diversion and obtain Pledges. Pledges should be included in new tenant orientation packages.	dependent upon strategy employed \$0-2000.



5)	<b><u>Flyers/Signage</u></b> - In order to enhance the existing recycling program (16.6% of the waste stream at this location was recyclable materials), new flyers and signage should be posted and distributed. Common areas and the recycling area at the rear of the building need communication pieces. All residents should be engaged with new blue bag/box receptacles and literature supporting programs.	\$0 - 500 dependant upon use of no charge City print media, vs. custom designed and printed materials.
6)	<b><u>Communications - Facebook</u></b> - Use Facebook to engage the younger population and spread the word of the new waste diversion strategies.	no charge

## H) Waste Diversion Strategies

### G.1 New Collection Solutions

1. City Organics – This strategy involves establishing an organics collection program at the building. The building must purchase an organics container, establish a collection date with the City and communicate the program elements to the tenants. The collection is offered at no charge to buildings receiving waste collection service from the City of Toronto. Please reference the City of Toronto website for full details at [http://www.toronto.ca/garbage/multi/green\\_bin\\_program.htm](http://www.toronto.ca/garbage/multi/green_bin_program.htm)
2. City E-Waste- This strategy involves establishing an E-waste collection program at the building. The building must establish a deposit location, establish a collection protocol with the City and communicate the program elements to the tenants. The collection is offered at no charge to buildings receiving waste collection service from the City of Toronto. Please reference the City of Toronto website for full details at <http://www.toronto.ca/target70/electronics.htm>
3. Charitable/Donatable Program - This strategy involves establishing a charitable donation collection program at the building. The building must establish a container location, establish a collection protocol with the Charity and communicate the program elements to the tenants.
4. In-Suite In-Sink Organic Disposal; This strategy involves installing garbage garburators in kitchen sinks of the units at a building. Softer organics will be ground and disposed of in the sanitary sewer system. This strategy should only be considered at buildings where sanitary sewers are separate from storm sewers and where a traditional organics collection program is not advisable. Please note that due to the additional load this strategy imposes on the sanitary sewer system, neither Toronto Water nor Solid Waste promote this strategy.

### G.2 Retrofit

1. Bi- or Tri-Sorter – This strategy involves the installation of a computer-based technology that directs waste placed into a chute into one of two (bi-sorter) or three (tri-sorter) containers, where the tenant uses a “pushbutton” system to select which type of waste/material is being placed in the chute: garbage, recycling and/or organics.
2. Divided Chute – This strategy involves retrofitting the existing chute envelope to construct a divided chute or second chute.
3. External Chute – Involves retrofitting the building to accommodate a recycling chute located outside of the building with access inside of the building
4. Create Indoor Recycling Area - Where indoor space permits, create an area inside the building for the deposit of recyclable material, organics, and even waste (in buildings without operational chute or chute has been closed)

### G.3 Operational Adjustments

1. **Temporary Chute Closure**– This strategy involves a temporary closure of the garbage chute in order to put recycling and waste diversion on par with garbage disposal in terms of convenience. The temporary chute closure approach works as a punitive measure to encourage better recycling behaviour by closing the building's chutes for short period of times in an effort to make residents aware of the need to participate in the recycling program.
2. **Permanent Chute Closure**– This strategy involves the permanent closure of the garbage chute in order to put recycling and waste diversion on par with garbage disposal in terms of convenience. For both services residents must take material to a designated location. At the time of writing, this activity requires a permit from the General Manager, Solid Waste Management Services, City of Toronto and the approval of 51% of the buildings residents. This approach is only available to buildings receiving the City of Toronto's waste collection service. Please reference the City of Toronto website for full details at [http://www.toronto.ca/garbage/multi/chutes\\_closure.htm](http://www.toronto.ca/garbage/multi/chutes_closure.htm)
3. **Door-to-Door Collection** - This strategy, and floor-to-floor (below) are other means of making recycling as convenient as, or more convenient than, disposal. Door-to-door approaches are, in effect, the multi-unit residential equivalent to curbside recycling. This strategy incurs significant increases in staffing and requires that building operators consult local authorities about fire codes. This strategy however can be implemented on a smaller scale to assist the elderly and/or physically challenged. Can work well where there is high volunteerism and/or community involvement.
4. **Floor-to-Floor Collection** - This approach, puts recycling and garbage disposal on equal footing by establishing recycling drop-off opportunities on each floor, often inside the chute room. Requires increase in staffing to allow bring the material down to the recycling bins.
5. **Designated Chute Times** – This approach, of designating specific times for allowing recyclables down the chute, and the one that follows, are variations of the same approach in which the existing chute system is used. In this case usage is regulated by time, meaning that tenants would be directed to use the chutes for specific materials (recyclables, organics, garbage) at designated times throughout the week.
6. **Compactor Optimization** – The City of Toronto waste levy system charges buildings for waste disposal based on waste container volume. Buildings are thereby incited to compact waste (where systems exist) and to ensure no loose waste or under compacted waste is put out for collection. This strategy will not increase diversion but may decrease disposal costs.
7. **Container Optimization** - When waste and/or recycling containers are full or difficult to access, waste management and waste diversion suffer. This strategy ensures that the most suitable sized and configured containers are located for the waste management program at the building.

#### G.4 Financial Tools & Incentives

The City of Toronto has invoked a waste levy system, a progressive policy that places a cost on waste collection (by waste volume) but rewards recycling and waste diversion by providing these services at no cost. The waste levy makes viable a number of building related investments and incentives to promote diversion.

1. Tenant Incentives – Rewards would be established for the tenants to encourage participation in the recycling program. The reward program could target the children of the building or adults or both; using prizes or coupons as the incentive.
2. Building and Community Rewards – Rather than rewarding the individual for participating in the recycling program, the community is rewarded for the building's overall participation in the recycling program, which in the case of multi-unit residential buildings often takes the form of upgrades to communal areas or tenant facilities.
3. Staff Incentives – This approach recognizes the effort put in by staff, i.e. superintendents, to promote and maintain an effective and attractive recycling program in the building. The incentive or reward, potentially supported by savings in the waste levy expense resulting from higher recycling rates, can be tied into recycling participation and recovery rates, with staff receiving higher rewards for achieving higher recycling rates in the building.
4. RecycleBank – RecycleBank is a corporate entity that rewards residents for participating in a community's recycling program. The reverse-vending machines are installed inside buildings and they issue coupons for deposit of selected recyclable material within the machine. The reward is in the form of redeemable coupons that can be used as cash at participating retailers, or as a token for a building lottery/awards program.

#### G.5 Outreach

These are supportive strategies in which communities work together towards a common goal of improving waste diversion through a variety of mechanisms: from communications to establishing waste diversion events.

1. 3Rs Ambassador Program– A coordinator for this City of Toronto supported initiative by the 3Rs Working Group (3RWG) was hired in the fall of 2009. The program targets the multi-unit residential sector and will seek to coordinate and grow a network of volunteer leaders throughout the multi-unit residential community. Volunteers will liaise with City staff, building superintendents and managers, and their neighbours, to promote and educate with respect to waste diversion. From the perspective of this study, a successful and aggressive Ambassador Program is seen as a positive development. Program benefits, such as fostering tenant pride and soliciting input from people who live in the buildings are consistent with the needs identified by the project team. Please reference the City of Toronto website for full details at <http://www.toronto.ca/garbage/multi/ambassador/index.htm>
2. Third Party Community Groups – This approach involves the use of community-based groups to conduct outreach and educate tenants about an issue. Groups of this type, some of which have been contacted for this study, often have a mandate for community outreach. While they are not necessarily the party that would present the technical information, they might be relied on to bring people to events. The support of credible

organizations which maintain good relations with tenants would likely benefit waste diversion efforts.

3. Events– It is sometimes useful to draw attention to a program or campaign by staging an event. This has the potential to add profile to the cause, draw interest from residents, and give cause to collect and contribute the relevant material in the household. The holding of an event, in addition to the promotional value, overcomes some of the barriers inherent in the multi-unit residential environment: people have the opportunity to see their neighbours participating and elements of anonymity and isolation are temporarily removed. Some specialized materials are ideally suited for event-style collection, such as electronics and certain special wastes although, especially for the latter, formal collection events of this type generally require approval from the Ministry of the Environment.
4. Pledges – The notion of signing a pledge to act was identified as a possible tool to gain commitment to the cause of recycling and waste diversion. “Pledging” is a voluntary act but the act of signing or reciting a pledge, which is a public declaration, is seen as obtaining a commitment to keep ones word.

#### G.6 Communications

These are supportive strategies that communicate waste diversion activities and waste diversion changes within buildings.

1. Facebook Site – A supportive strategy uses the power of social media through the development of a “waste diversion site” on the internet to communicate change and obtain feedback regarding waste management within a defined building. It is possible for management to communicate with tenants regarding changes and challenges and tenants to provide feedback and recommendations.
2. Flyers & Signage – A supportive strategy that uses flyers and signs to communicate waste diversion and waste management programs to the tenants. Please reference the City of Toronto website for full details at <http://www.toronto.ca/garbage/publications.htm>

## I) Location Summary Tables

Notes on the Location Summary Tables:

- Population Size: this is the size of the Location given both in number of units and in comparison to the other field test Locations.
- Turnover: this is given in both percent of units per month and in comparison to the other field test Locations.
- The calculation of Demographic Statistics, including Language Skills, Education Skills, Immigration/Visible Minority Skills and Low Income, are fully described in Section 2.4. These statistics, from 2006 Census Tract Profile, Statistics Canada, were analyzed to identify significant outliers. Outliers were defined as any score that was not within the range of the Location, Toronto and Ontario average scores for that statistic. The immigration and visible minority scores were combined: the percentages were averaged and compared against the Location, Toronto and Ontario average to identify outliers.

### Location 1: Summary Table

Building and Population Aspect		Demographic Aspect	
Number of Floors:	14	Language Skills:	Average
Number of Units:	164	Education Skills:	Low
Population Size:	574 (Average)	Immigration/Visible Minority:	Average
Turnover (% units/month):	1.5% (Low)	Low Income:	Average
Average # Tenants per Unit:	3.5	Tenant Family Type:	Mix of families

Ownership & Management Aspect	
Ownership / Management:	Large Private / Owner Managed
Changes During Project:	August-October 2012 - Site Staff change with 2 month vacancy

Waste Diversion Strategies	
Waste Diversion Strategies Already in Place:	1) City Recycling. No City Organics and no 3Rs Ambassadors in place.
Waste Diversion Strategies Implemented:	1) City Organics Implementation, 2) 3Rs Ambassadors, and 3) Flyers & Signage
Time Fully Implemented:	5 months prior to final waste assess. 3Rs Amb. not active at conclusion.
Implementation Costs:	\$1,400 (organics bin and hosting events) and 2 staff hours
Operational Costs/Savings:	\$312/month savings (reduced waste service) and 0 hours/week.
Social, Educational Benefits:	Lobby meet-and-greet to distribute waste diversion materials. 8 tenants trained as 3Rs Ambassadors conducted door-to-door educational outreach. Staff reports improved communication with tenants. Staff reports tenants & staff more informed in waste diversion.
Tenant Comments:	Tenants feel good and proud to be part of the program, find taking organics & recycling to same area convenient, find opening organic bin door difficult, and would prefer (recycling and organic) bins were inside the building.
Staff / Management Comments:	Staff surprised at how quickly tenants participated seeing reduced waste in first month. Waste collection quickly went from 2ce to 1ce/weekly. Recycling bins almost overflowing weekly.

Waste Diversion Strategy Effectiveness	Pre-implementa-tion	Post-implementa-tion	% Change	Net Improvement Tower Rank (1-10)
Waste Generation kg/unit/day	1.22	1.45	18.85%	<b>9</b>
Recyclable Material kg/unit/day	0.45	0.49	8.89%	-
Organics kg/unit/day	0	0.23	100.00%	-
Waste Diversion Rate	27.08%	32.98%	21.79%	<b>4</b>
% Waste in waste stream*	8.40%	9.23%	9.88%	<b>9</b>
% Organics in waste stream*	73.40%	75.03%	2.22%	-
% Recycl. mat. in waste stream*	16.10%	15.11%	-6.15%	-
% HSW in waste stream*	0.30%	0.00%	-100.00%	-
% Donatables in waste stream*	1.80%	0.63%	-65.00%	-
* by weight				
Pre-Implementation Waste Diversion Rank				<b>5</b>
Post-Implementation Waste Diversion Rank				<b>6</b>
Overall Waste Diversion Improvement Rank				<b>8</b>





Location 2: Summary Table					
Building and Population Aspect		Demographic Aspect			
Number of Floors:	25	Language Skills:	Average		
Number of Units:	172	Education Skills:	High		
Population Size:	200 (Small)	Immigration/Visible Minority:	High		
Turnover (% units/month):	0.6% (Low)	Low Income:	Average		
Average # Tenants per Unit:	1.2	Tenant Family Type:	Senior & families		
Ownership & Management Aspect					
Ownership / Management:	Condominium / 3rd Party Management				
Changes During Project:	August 2012 - Property Manager change				
Waste Diversion Strategies					
Waste Diversion Strategies Already in Place:	1) City Recycling & 2) City Organics. No 3Rs Ambassadors.				
Waste Diversion Strategies Implemented:	1) Organics inside building drop-off, 2) 3Rs Ambassador, 3) Flyers & Signage				
Time Fully Implemented:	6 months prior to final waste assess. 3Rs Amb. not active at conclusion.				
Implementation Costs:	\$0 cost and 8 staff hours				
Operational Costs/Savings:	\$0 cost and savings of 2.5 hours/wk (less waste movement)				
Social, Educational Benefits:	Party Room meet-and-greet educational event with approximately half the population in attendance. Three 3Rs Ambassadors were trained and helped host event but were no longer active at end of project. Management did not feel better educated but felt had better communication with tenants.				
Tenant Comments:	No comments but, according to management, tenants are compliant with new program.				
Staff / Management Comments:	Management felt the waste diversion strategy was a good idea.				
Waste Diversion Strategy Effectiveness		Pre-implement- ation	Post-implement- ation	% Change	Net Improvement Tower Rank (1-10)
Waste Generation kg/unit/day		0.92	0.70	-23.56%	1
Recyclable Material kg/unit/day		0.70	0.59	-15.71%	-
Organics kg/unit/day		0.25 <sup>e</sup>	0.3	20.00% <sup>e</sup>	-
Waste Diversion Rate		50.86%	56.02%	10.15%	5
% Waste in waste stream*		25.71%	34.93%	35.86%	4
% Organics in waste stream*		60.07%	47.99%	-20.11%	-
% Recycl. mat. in waste stream*		11.42%	15.29%	33.89%	-
% HSW in waste stream*		0.04%	0.00%	-100.00%	-
% Donatables in waste stream*		2.76%	1.79%	-35.14%	-
* by weight e estimated based on 20% reduction in organics by weight in waste stream		Pre-Implementation Waste Diversion Rank			1
		Post-Implementation Waste Diversion Rank			1
		Overall Waste Diversion Improvement Rank			3
Location 3: Summary Table					

Building and Population Aspect		Demographic Aspect	
Number of Floors:	17	Language Skills:	Low
Number of Units:	216	Education Skills:	High
Population Size:	600 (Average)	Immigration/Visible Minority:	High
Turnover (% units/month):	3.7% (High)	Low Income:	High
Average # Tenants per Unit:	2.8	Tenant Family Type:	Families

Ownership & Management Aspect	
Ownership / Management:	Large Private / 3rd Party Management
Changes During Project:	Sept 2012 - New building owner and new property manager.

Waste Diversion Strategies	
Waste Diversion Strategies Already in Place:	1) City Recycling & 2) City Organics. No 3Rs Ambassadors.
Waste Diversion Strategies Implemented:	1) Create indoor recycling and organics area. At end of project: recycling and organics bins no longer inside and located 15m further from the building than previously, and 2) Flyers & Signage
Time Fully Implemented:	0 months: waste diversion strategy reversed upon change of ownership.
Implementation Costs:	\$825 (organic chute) & 1 staff hour (distributing recycling bags)
Operational Costs/Savings:	Costs 2 hours/week staff time cleaning up recycling
Social, Educational Benefits:	No social events, residents committees or 3Rs Ambassadors engaged in this project. Management/staff did not feel educated nor did they feel there was improvement in management/staff-tenant communications.
Tenant Comments:	No comments to date, however tenants are aware as they are "reporting" neighbours who don't participate to site staff. Tenants understand they need to participate in recycling. Non-english speaking tenants find it more difficult to understand the program.
Staff / Management Comments:	Management has a strictly enforced waste compactor bin exchange program which can lead to over-weight compactor bins.

Waste Diversion Strategy Effectiveness	Pre-implementa-tion	Post-implementa-tion	% Change	Net Improvement Tower Rank (1-10)
Waste Generation kg/unit/day	1.59	1.64	3.14%	<b>7</b>
Recyclable Material kg/unit/day	0.61	0.47	-22.95%	-
Organics kg/unit/day	0.13 e	0.13	0.00%	-
Waste Diversion Rate	31.64%	26.68%	-15.68%	<b>6</b>
% Waste in waste stream*	17.31%	19.49%	12.59%	<b>8</b>
% Organics in waste stream*	50.04%	55.43%	10.77%	-
% Recycl. mat. in waste stream*	27.55%	22.10%	-19.78%	-
% HSW in waste stream*	0.17%	0.20%	17.65%	-
% Donatables in waste stream*	4.92%	2.78%	-43.50%	-
<b>Pre-Implementation Waste Diversion Rank</b>				<b>4</b>
<b>Post-Implementation Waste Diversion Rank</b>				<b>3</b>
<b>Overall Waste Diversion Improvement Rank</b>				<b>7</b>

\* by weight

e – estimated (not weighed)

<b>Location 4: Summary Table</b>
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Building and Population Aspect		Demographic Aspect	
Number of Floors:	27	Language Skills:	Average
Number of Units:	226	Education Skills:	Low
Population Size:	1,350 (Large)	Immigration/Visible Minority:	High
Turnover (% units/month):	3.8% (High)	Low Income:	High
Average # Tenants per Unit:	6	Tenant Family Type:	Families

Ownership & Management Aspect	
Ownership / Management:	Large Private / 3rd Party Managed
Changes During Project:	Jan 2012-transition of returning waste management specialist

Waste Diversion Strategies	
Waste Diversion Strategies Already in Place:	1) City Recycling. No City Organics or 3Rs Ambassadors
Waste Diversion Strategies Implemented:	1) City Organics, 2) Increased Recycling Capacity & 3) Flyers & Signage
Time Fully Implemented:	2 months prior to final waste assessment
Implementation Costs:	\$2,400 (bin costs) & 5.5 staff hours (meet-and-greet)
Operational Costs/Savings:	\$0 cost & 0 staff hours/week (no net impact on staffing)
Social, Educational Benefits:	Lobby meet-and-greet to distribute materials. Management/staff was quite impressed with the turnout of tenants. Management/staff felt better educated and felt management-tenant communication had improved.
Tenant Comments:	Tenants like that organics and recycling are in same location so just as easy. Some tenants blame more rodents on the organics program.
Staff / Management Comments:	Capacity for recycling needs to be further increased at this time.

Waste Diversion Strategy Effectiveness	Pre-implement- ation	Post-implement- ation	% Change	Net Improvement Tower Rank (1-10)
Waste Generation kg/unit/day	1.68	1.38	-17.86%	<b>3</b>
Recyclable Material kg/unit/day	0.21	0.35	66.67%	-
Organics kg/unit/day	0	0.03	100.00%	-
Waste Diversion Rate	11.33%	21.52%	89.94%	<b>1</b>
% Waste in waste stream*	4.44%	17.35%	290.77%	<b>2</b>
% Organics in waste stream*	70.66%	47.20%	-33.20%	-
% Recycl. mat. in waste stream*	21.43%	33.76%	57.54%	-
% HSW in waste stream*	0.43%	0.00%	-100.00%	-
% Donatables in waste stream*	3.04%	1.70%	-44.08%	-

\* by weight

<b>Pre-Implementation Waste Diversion Rank</b>	<b>10</b>
<b>Post-Implementation Waste Diversion Rank</b>	<b>7</b>
<b>Overall Waste Diversion Improvement Rank</b>	<b>1</b>

<b>Location 5 (Control): Summary Table</b>
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Building and Population Aspect		Demographic Aspect	
Number of Floors:	26	Language Skills:	Average
Number of Units:	246	Education Skills:	Low
Population Size:	900 (Large)	Immigration/Visible Minority:	Average
Turnover (% units/month):	2.4% (Average)	Low Income:	Average
Average # Tenants per Unit:	3.7	Tenant Family Type:	Families

Ownership & Management Aspect	
Ownership / Management:	Small Private / 3rd Party Managed
Changes During Project:	Jan 2012 - New Property Management Co. and new site staff

Waste Diversion Strategies	
Waste Diversion Strategies Already in Place:	1) City Recycling. No City Organics or 3Rs Ambassadors
Waste Diversion Strategies Implemented:	None. Upon change of property management, this building ceased to be part of the project. This building served as a control for "do nothing" approach. According to management, they had made no changes to waste management nor were there any changes in occupancy during the field test.
Time Fully Implemented:	Not applicable
Implementation Costs:	\$0 cost and 0 hours staff time
Operational Costs/Savings:	\$0 cost and 0 hours/week staff time (no net change)
Social, Educational Benefits:	Not applicable
Tenant Comments:	Not applicable
Staff / Management Comments:	Not applicable

Waste Diversion Strategy Effectiveness	Pre-implement- mentation	Post-implement- mentation	% Change	Net Improvement Tower Rank (1-10)
Waste Generation kg/unit/day	1.51	1.17	-22.52%	<b>2</b>
Recyclable Material kg/unit/day	0.53	0.35	-33.96%	-
Organics kg/unit/day	0	0	0.00%	-
Waste Diversion Rate	25.87%	22.97%	-11.21%	<b>7</b>
% Waste in waste stream*	9.72%	8.00%	-17.70%	<b>10</b>
% Organics in waste stream*	64.69%	54.51%	-15.74%	-
% Recycl. mat. in waste stream*	24.37%	25.21%	3.45%	-
% HSW in waste stream*	0.00%	0.25%	100.00%	-
% Donatables in waste stream*	1.21%	12.03%	894.21%	-
* by weight				
Pre-Implementation Waste Diversion Rank				<b>6</b>
Post-Implementation Waste Diversion Rank				<b>8</b>
Overall Waste Diversion Improvement Rank				<b>6</b>

<b>Location 6: Summary Table</b>
----------------------------------

Building and Population Aspect		Demographic Aspect	
Number of Floors:	25	Language Skills:	Average
Number of Units:	265	Education Skills:	Low
Population Size:	678 (Average)	Immigration/Visible Minority:	High
Turnover (% units/month):	1.9% (Low)	Low Income:	High
Average # Tenants per Unit:	2.6	Tenant Family Type:	Families

Ownership & Management Aspect	
Ownership / Management:	Small Private / 3rd Party Management
Changes During Project:	Jan 2012 – inter-building site staff transfer & transition of returning waste management specialist

Waste Diversion Strategies	
Waste Diversion Strategies Already in Place:	1) City Recycling with significant contamination in the recycling container, & 2) City Organics (not implemented). No 3Rs Ambassadors.
Waste Diversion Strategies Implemented:	1) Provide inside recycling in move-in room (locked outside enclosure), 2) Flyers & Signage, and 3) City Organics re-launch (incomplete)
Time Fully Implemented:	1) Inside recycling: 2 months prior to final waste assessment. 2) City Organics: <1 month prior to final waste assessment.
Implementation Costs:	\$900 (in-suite organic totes not covered by City) and 3 staff hours
Operational Costs/Savings:	Cost 5 hours/week staff removing waste from recycling bin
Social, Educational Benefits:	Lobby meet-and-greet to distribute materials. Management reports more informed on waste diversion and better communication with tenants.
Tenant Comments:	Management reports container signage confusing tenants resulting in waste being placed in recycling and creating mess in inside recycling area.
Staff / Management Comments:	Management reports major staff challenge to sort materials in move-in area where tenants "dump everything".

Waste Diversion Strategy Effectiveness	Pre-implement- mentation	Post-implement- mentation	% Change	Net Improvement Tower Rank (1-10)
Waste Generation kg/unit/day	0.81	1.35	66.67%	<b>10</b>
Recyclable Material kg/unit/day	0.88	0.43	-51.14%	-
Organics kg/unit/day	0	0	0.00%	-
Waste Diversion Rate	51.99%	23.99%	-53.86%	<b>10</b>
% Waste in waste stream*	11.07%	13.12%	18.52%	<b>6</b>
% Organics in waste stream*	49.20%	55.48%	12.76%	-
% Recycl. mat. In waste stream*	33.52%	28.00%	-16.47%	-
% HSW in waste stream*	6.21%	0.04%	-99.36%	-
% Donatables in waste stream*	0.00%	3.35%	100.00%	-

\* by weight

\*\* misleadingly high as there was significant recycling contamination

<b>Pre-Implementation Waste Diversion Rank</b>	<b>3**</b>
<b>Post-Implementation Waste Diversion Rank</b>	<b>5</b>
<b>Overall Waste Diversion Improvement Rank</b>	<b>10</b>

<b>Location 7: Summary Table</b>
----------------------------------

Building and Population Aspect		Demographic Aspect	
Number of Floors:	8	Language Skills:	High
Number of Units:	47	Education Skills:	High
Population Size:	50 (Small)	Immigration/Visible Minority:	Low
Turnover (% units/month):	2.1% (Average)	Low Income:	Low
Average # Tenants per Unit:	1.1	Tenant Family Type:	Adult

Ownership & Management Aspect	
Ownership / Management:	Large Private / Owner Managed
Changes During Project:	Property manager and site staff change October 2013

Waste Diversion Strategies	
Waste Diversion Strategies Already in Place:	1) City Recycling. No City Organics or 3Rs Ambassadors
Waste Diversion Strategies Implemented:	1) Garbage chute closure (requiring modification to outside waste and recycling area) & 2) Flyers & Signage
Time Fully Implemented:	2 weeks prior to final waste assessment
Implementation Costs:	\$4,700 (fence, chute closure) & 8 staff hours (polling, outreach)
Operational Costs/Savings:	\$0 savings and savings 1.5 staff hours/week
Social, Educational Benefits:	Management and staff feel better educated and believe education is key to the success. Management and staff also feel communication with tenants has improved.
Tenant Comments:	No comments either negative or positive have been received.
Staff / Management Comments:	Staff are happy that they no longer need to wheel messy garbage totes and clean up the chute landing area.

Waste Diversion Strategy Effectiveness	Pre-implement- mentation	Post-implement- mentation	% Change	Net Improvement Tower Rank (1-10)
Waste Generation kg/unit/day	0.49	0.43	-12.24%	<b>4</b>
Recyclable Material kg/unit/day	0.43	0.26	-39.53%	
Organics kg/unit/day	0	0	0.00%	-
Waste Diversion Rate	46.82%	37.78%	-19.30%	<b>8</b>
% Waste in waste stream*	13.58%	17.39%	28.06%	<b>5</b>
% Organics in waste stream*	62.10%	63.55%	2.33%	-
% Recycl. mat. in waste stream*	21.20%	18.11%	-14.58%	-
% HSW in waste stream*	0.00%	0.03%	0.00%	-
% Donatables in waste stream*	3.15%	0.92%	-70.79%	-

\* by weight

NA not available

<b>Pre-Implementation Waste Diversion Rank</b>	<b>1</b>
<b>Post-Implementation Waste Diversion Rank</b>	<b>2</b>
<b>Overall Waste Diversion Improvement Rank</b>	<b>5</b>

<b>Location 8: Summary Table</b>
----------------------------------

Building and Population Aspect		Demographic Aspect	
Number of Floors:	18	Language Skills:	Low
Number of Units:	234	Education Skills:	Low
Population Size:	936 (Large)	Immigration/Visible Minority:	High
Turnover (% units/month):	0.4% (Low)	Low Income:	High
Average # Tenants per Unit:	4	Tenant Family Type:	Families

Ownership & Management Aspect	
Ownership / Management:	Large Private / Owner Managed
Changes During Project:	August 2012 - Site staff change

Waste Diversion Strategies	
Waste Diversion Strategies Already in Place:	1) City Recycling. No City Organics or 3Rs Ambassadors.
Waste Diversion Strategies Implemented:	1) Increased recycling capacity & distribute recycling bags to tenants, 2) Tenant incentive program-monthly draw for "Best Recycler", and 3) Flyers & Signage
Time Fully Implemented:	Less than 1 month prior to final waste assessment
Implementation Costs:	\$1,200 (recycling bin) and 6 staff hours
Operational Costs/Savings:	Savings \$66.50/week (monthly draw \$50 value & reduced waste collection saves \$78/wk). Costs 2 staff hours/week handing out recycling tickets
Social, Educational Benefits:	Monthly draws for the prize of being "best recycler" brings the community together. Management did not feel better educated on waste diversion however report improved communications with tenants.
Tenant Comments:	Tenants motivated to recycle by monthly draw for the prize. Tenants want recycling bin inside building.
Staff / Management Comments:	Site staff was surprised - did not think the draw would work but they saw a huge increase in recycling participation.

Waste Diversion Strategy Effectiveness	Pre-implement- mentation	Post-implement- mentation	% Change	Net Improvement Tower Rank (1-10)
Waste Generation kg/unit/day	1.91	2.22	16.23%	<b>8</b>
Recyclable Material kg/unit/day	0.29	0.23	-20.69%	-
Organics kg/unit/day	0	0	0.00%	-
Waste Diversion Rate	13.29%	9.45%	-28.89%	<b>9</b>
% Waste in waste stream*	8.28%	9.37%	13.16%	<b>7</b>
% Organics in waste stream*	63.97%	56.30%	-11.99%	-
% Recycl. mat. in waste stream*	25.45%	20.22%	-20.55%	-
% HSW in waste stream*	0.05%	0.00%	-100.00%	-
% Donatables in waste stream*	2.24%	14.10%	529.46%	-
* by weight				
<b>Pre-Implementation Waste Diversion Rank</b>				<b>8</b>
<b>Post-Implementation Waste Diversion Rank</b>				<b>10</b>
<b>Overall Waste Diversion Improvement Rank</b>				<b>9</b>



<b>Location 9: Summary Table</b>
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Building and Population Aspect		Demographic Aspect	
Number of Floors:	14	Language Skills:	Average
Number of Units:	128	Education Skills:	High
Population Size:	640 (Average)	Immigration/Visible Minority:	Average
Turnover (% units/month):	2.0% (Average)	Low Income:	Average
Average # Tenants per Unit:	5	Tenant Family Type:	Families

Ownership & Management Aspect	
Ownership / Management:	Public (Toronto Community Housing Corp) / Owner Managed
Changes During Project:	Property Management changes, site staff vacancy for 3 months, and 3 changes in community outreach members.

Waste Diversion Strategies	
Waste Diversion Strategies Already in Place:	1) City Recycling. No City Organics or 3Rs Ambassadors.
Waste Diversion Strategies Implemented:	1) Create indoor recycling area (organics program on-hold pending resolution of odour issue), & 2) Flyers & Signage
Time Fully Implemented:	4 months prior to final waste assessment
Implementation Costs:	\$2,000 (setup indoor recycling room) and 15 staff hours (staff meetings)
Operational Costs/Savings:	\$0 cost and savings of 3.5 hrs/wk (less litter reducing cleaning time)
Social, Educational Benefits:	Meet-and-greet to distribute materials. Management felt better informed on waste diversion and felt communications with tenants had improved. Management feels the key to success is to continue to educate tenants.
Tenant Comments:	Tenants are interested and pleased with the program: they particularly like that the program is easy and inside as well as the cleanliness of the recycling room.
Staff / Management Comments:	1) Initial green bin was too big for the room creating significant odour so the green bin program was put on hold pending receipt of smaller bin. 2) Lack of involvement from community outreach department. They are starting a new dept in January for resident services.

Waste Diversion Strategy Effectiveness	Pre-implementa-tion	Post-implementa-tion	% Change	Net Improvement Tower Rank (1-10)
Waste Generation kg/unit/day	2.52	2.27	-9.92%	<b>5</b>
Recyclable Material kg/unit/day	0.51	0.85	66.67%	-
Organics kg/unit/day	0	0	0.00%	-
Waste Diversion Rate	16.77%	27.23%	62.37%	<b>2</b>
% Waste in waste stream*	8.17%	32.26%	294.86%	<b>1</b>
% Organics in waste stream*	57.40%	28.92%	-49.62%	-
% Recycl. mat. in waste stream*	31.39%	33.39%	6.37%	-
% HSW in waste stream*	2.05%	0.10%	-95.12%	-
% Donatables in waste stream*	1.00%	5.33%	433.00%	-
* by weight	Pre-Implementation Waste Diversion Rank			<b>8</b>
	Post-Implementation Waste Diversion Rank			<b>3</b>
	Overall Waste Diversion Improvement Rank			<b>2</b>



<b>Location 10: Summary Table</b>
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Building and Population Aspect		Demographic Aspect	
Number of Floors:	8	Language Skills:	High
Number of Units:	77	Education Skills:	Low
Population Size:	385 (Small)	Immigration/Visible Minority:	Average
Turnover (% units/month):	1.3% (Low)	Low Income:	Low
Average # Tenants per Unit:	5	Tenant Family Type:	Families

Ownership & Management Aspect	
Ownership / Management:	Large Private / Owner Managed
Changes During Project:	May 2012 - Property Manager and Site Staff vacancy

Waste Diversion Strategies	
Waste Diversion Strategies Already in Place:	1) City Recycling. No City Organics or 3Rs Ambassadors.
Waste Diversion Strategies Implemented:	1) Change from roll-cart to Front-end recycling service, 2) City E-waste implementation, and 3) Flyers & Signage
Time Fully Implemented:	5 months prior to final waste assessment
Implementation Costs:	\$2,000 (cost of bins) & 4 staff hours
Operational Costs/Savings:	No costs or savings
Social, Educational Benefits:	Lobby meet-and-greet to distribute materials. Management did not feel better informed on waste diversion but felt communications with tenants had improved.
Tenant Comments:	Tenants find recycling area cleaner.
Staff / Management Comments:	Switched from one 6-yd container for waste to 2 by 3-yd containers so in future can reduce waste service through flexibility.

Waste Diversion Strategy Effectiveness	Pre-implement- mentation	Post-implement- mentation	% Change	Net Improvement Tower Rank (1-10)
Waste Generation kg/unit/day	1.75	1.72	-1.71%	<b>6</b>
Recyclable Material kg/unit/day	0.28	0.41	46.43%	-
Organics kg/unit/day	0	0	0.00%	-
Waste Diversion Rate	13.64%	19.17%	40.54%	<b>3</b>
% Waste in waste stream*	15.15%	29.75%	96.37%	<b>3</b>
% Organics in waste stream*	59.03%	54.33%	-7.96%	-
% Recycl. mat. in waste stream*	16.62%	15.54%	-6.50%	-
% HSW in waste stream*	1.06%	0.27%	-74.53%	-
% Donatables in waste stream*	8.14%	0.10%	-98.77%	-

\* by weight

<b>Pre-Implementation Waste Diversion Rank</b>	<b>7</b>
<b>Post-Implementation Waste Diversion Rank</b>	<b>8</b>
<b>Overall Waste Diversion Improvement Rank</b>	<b>4</b>

## J) Tower Renewal STEP Program Checklist



### Tower Renewal - STEP Program Waste Reduction and Diversion (Step 1 - 4)

Checklist

For more information on these tasks, see the STEP Toolkit at [http://www.toronto.ca/tower\\_renewal/step\\_waste.htm](http://www.toronto.ca/tower_renewal/step_waste.htm)

#### Building Information

Street No.	Street Name	Postal Code
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#### Contact Information

First Name	Last Name	Telephone No.
Company Name		Email

#### Step 1 Learning and Planning

<input type="checkbox"/> Inventory garbage chutes, garbage containers and recycling containers. <input type="checkbox"/> Look for garbage in recyclables and recyclables in garbage. Record your observations. <input type="checkbox"/> Research available communication materials for resident education on recycling. <input type="checkbox"/> Research industry templates and standards of building operating procedures for waste handling. <input type="checkbox"/> Undertake an audit of the building's waste stream. <input type="checkbox"/> Determine the number of recycling containers for the building based on City of Toronto standards. <input type="checkbox"/> Gather and assess current use of strategies for waste diversion, such as: <div style="display: flex; justify-content: space-between;"> <div> <input type="checkbox"/> improving accessibility of recycling facilities  <input type="checkbox"/> improving lighting in recycling areas  <input type="checkbox"/> keeping recycling areas clean and tidy </div> <div> <input type="checkbox"/> ensuring there are enough recycling bins  <input type="checkbox"/> educating residents on regular basis </div> </div> <input type="checkbox"/> Assess and discuss potential implementation of strategies with City of Toronto waste management staff. Gather examples of successful working programs and visit one or two. <input type="checkbox"/> Undertake a cost/benefit analysis of implementation options. <input type="checkbox"/> Hold resident consultation sessions to discuss options for improving diversion (e.g. resident ambassadors). <input type="checkbox"/> Conduct a survey to find out people's garbage disposal and recycling behaviour. <input type="checkbox"/> Obtain comprehensive information on all City diversion programs (e.g. household waste, electronic waste).
---

#### Step 2 Implementation

<input type="checkbox"/> Establish a diversion goal with a target of 35% by encouraging the reuse and recycling of items. <input type="checkbox"/> Based on the diversion goal, implement an approach for each of type of waste stream: recyclables, e-waste, household hazardous and special waste, and organics. <input type="checkbox"/> Install required hardware, related signage and containers. <input type="checkbox"/> Review and improve, as required, procedures for building staff related to the implementation activities. <input type="checkbox"/> Undertake a communications and outreach program. <input type="checkbox"/> Ensure bins are maintained, cleaned, and emptied regularly. Full recycling bins will lead to disposal of recyclables in garbage. <input type="checkbox"/> Throughout implementation, meet with participants to determine site specific barriers/get feedback on areas for improvement
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Continue on next page

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## Tower Renewal - STEP Program

### Waste Reduction and Diversion (Step 1 - 4) (continued)

#### Step 3 High Performance

- ☐ Set a target to divert at least 50% through recycling versus baseline building or reference standard established by Solid Waste Management Division.
- ☐ Track any improvements compared to the monitoring done for the foundation stage. Monitor waste fees/quantities and track trends. Continue to seek out feedback from all participants.
- ☐ Continue to monitor program performance and trouble shoot challenges that arise. Regularly review contents of recycling bins and garbage containers.
- ☐ Monitor waste invoices and per unit waste costs. Note any trend such as a percentage drop.
- ☐ Acknowledge and celebrate the successes to date from the waste diversion program. Consider providing incentives/rewards to encourage residents and staff participation.
- ☐ Actively participate in all City diversion programs including green bin organics, E-waste, HHW and bulky goods collection.
- ☐ Set out a schedule and provide regular refresher education activities for residents and building staff.
- ☐ For all building operations, buy quality durable items that are replaced infrequently. Make decisions about operational materials that support minimal packaging, recycled content, and other waste minimization considerations.

#### Step 4 Leadership

- ☐ Implement action items designed to divert over 50% versus baseline building or reference standard established by Solid Waste Management Division.
- ☐ Be a community ambassador for waste diversion. Document the process and outcomes into case study report.
- ☐ Consider working with City staff, stewardship organizations and other nearby buildings to establish occasional collection programs for e-waste and household hazardous or special wastes. If the building happens to be located near a collection facility, promote the use of that facility.

Please forward the completed checklist by:

**Mail:** Tower Renewal Office  
c/o STEP Program  
Toronto City Hall, 10<sup>th</sup> Floor, East Tower  
100 Queen Street West  
Toronto, Ontario M5H 2N2

**Email:** tower@toronto.ca

The Tower Renewal Office collects information on this form to benchmark efficiency and conservation components and quality of life components. Questions about this collection can be directed to the Project Director, Tower Renewal at Toronto City Hall, 10<sup>th</sup> Floor, East Tower, 100 Queen Street West, Toronto, Ontario M5H 2N2 or by telephone at 416-392-9716.

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