

RESIDENTIAL CURBSIDE COLLECTION PROGRAM SET-OUT STUDY

(WDO OPT-R1-10)

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1.0 INTRODUCTION

1.1 Background

The Waste Management Division has conducted two previous Set-Out Studies in 1993-94 and 1995 for the purposes of developing and monitoring new waste management programs and to benchmark the effectiveness of these programs. Since it has been five years since the last study, and several new programs are planned for the next few years as outlined in the Region of Peel's Long Term Waste Resource Management Strategy, this Curbside Set-Out Study was performed to gather current information on residential curbside material that is set out for collection.

1.2 Project Objectives

The Regional Municipality of Peel's Waste Management Division continues to strive to increase waste diversion. Through the process of this study, household waste production was estimated and the waste needs of the future predicted.

The study was utilized as a measurement tool to continue with the benchmarking undertaken in the previous studies, to assess the success of new waste programs, and to help determine the communication requirements for the public prior to the roll-out of new programs. The Waste Management Division requires current information for the planning of the Bag Limit/User Pay Program, the Grass Ban to the curbside collection program proposed for implementation in 2001, and the Region-wide Organics Collection Program.

In September 2000, the Grey Box Program, which collects fibrous/paper materials, was introduced to the Region. As the study was already in progress at this time the effectiveness of this new recycling program was analyzed in order to measure the resident's adjustment to the new program, and the recyclable material diverted through the garbage stream.

1.3 Project Methodology

From May 15 to November 17, 2000 collection of data occurred within randomly selected neighbourhoods of various housing types in order to obtain diverse sampling results. Over the course of the 6-month study, data was collected from 2,137 households on residential curbside disposal of garbage, recyclable material, bulky items and yard waste

1.4 Geographic Scope

The Region of Peel is situated in the west-central portion of the Greater Toronto area and is composed of three municipalities, Brampton, Mississauga and Caledon. The Region of Peel covers 1,225 square kilometers (473 square miles) and stretches from Lake Ontario

in the south, to the Oak Ridges Moraine and above the Niagara Escarpment in the north, Peel includes a diverse mixture of urban, suburban, rural, agricultural and natural landscapes. As of 2001, Peel has an estimated population well over 900,000 persons.

2.0 METHODOLOGY

The Curbside Set-Out Study involved curbside monitoring of randomly selected areas. The material was measured in units of bag equivalents (BE). One bag equivalent was equal to the standard size garbage bag (26x36") or one small garbage can. Material set-out at the curb was visually assessed by field staff as to its bag equivalent. For example, a large garbage can with wheels was generally two BE, while ten small grocery bags of garbage would be one BE. All material quantities were measured in half increments (e.g. 0.5, 1.0, 1.5, etc). For further information please refer to the bag equivalent chart in Appendix 1.

This study also examined the rate of Blue and Grey Box participation, quantity of set-out, yard waste and the method it was placed at the curb. Quantity of Blue/Grey Box material was measured in terms of a typical box size in half increments worth of material. Yard waste was measured in terms of bags, cans, or bushels. Bulky items were recorded as number of bulky items and then were evaluated in terms of bag equivalents, which were measured by visual estimation.

2.1 Determining the Number of Waste Samples to Collect

The sample size was based on a 95% level of confidence with a 2.5% margin of error, which is recommended in *Designing and Conducting Survey Research* (Rea and Parker, 1992). In other words, the sample size would allow the study to be 95% confident that the true population mean would lie within $\pm 2.5\%$ of the sample mean. These values were recommended to minimize the risk of drawing incorrect conclusions from the sample data.

Census data for the number of households was available from the Planning Department for 1996. The data was available for small geoGraphic units (SGUs). The sample size calculation was not sensitive enough to require forecasting this data to the year 2000 values. There were a total of 215,279 households in the Region of Peel (not including apartments). Sample size calculations indicated that 1,800 households should be sampled each week with this number distributed among the different housing types and municipalities. Each week 2,137 houses were sampled.

2.2 Study Areas/Frequency of Data Collection

Typical neighbourhoods that represent different housing types in the Region of Peel were randomly chosen to study garbage set-out behaviour and patterns. Refer to Appendix 1 for maps of the study areas along with a list of the sample areas by

housing type and sample size. Sample data was collected from the following housing types, as seen in Table 1.

Table 1: The Percentage of Housing Types that Comprised the Study Areas

Housing Types	Number	Percent
Mature Town Houses	197	9%
New Town Houses	278	13%
Mature Estate	284	13%
New Estate	288	13%
Mature Single Detached	547	26%
New Single Detached	277	13%
Mature Semi-Detached	115	5%
New Semi-Detached	51	2%
Rural	100	5%
Total	2137	100%

The same sample areas were studied each week over the six-month study to determine set out frequency over time and seasonal variations. This study provided information on the number of times a household placed out items to the curb for collection. For example, how often does the typical household place the Blue Box out or yard waste for collection? For the 1996 Curbside Study, a household was considered to be participating in the Blue Box Program if it contributed to the program at least once in a four-week period. This study runs from spring to late autumn in order to provide information on volume fluctuations over the different seasons.

This method of sampling provided information according to housing type within the Region of Peel and allowed for program planning to be tailored to the different characteristics of each housing type. For example, garbage set-out behaviour and patterns may be different in a mature community of low density dwellings than in a new community of high density dwellings. The study determined the level of communication each community would require based on housing type along with forecasting the impact of new programs at the community level.

2.3 Sampling Procedure

For the purpose of the Curbside Set-out Study, three staff members used Regional vehicles to record set-out data by pen and paper on a spread sheet (Appendix 2). Data was collected on residential curbside disposal of garbage, recyclable material, bulky items and yard waste. The data was recorded in an Access database when staff returned to the office.

2.3.1 Curbside Garbage Monitoring

Garbage was evaluated in terms of bags, cans and incorrect i.e. garbage placed in cardboard boxes was not acceptable according to the Waste By-law. Bags were evaluated visually based on the average size of a typical garbage bag (26x36’’). Small garbage cans were counted as one can, and large garbage cans with wheels were counted as two garbage cans. Incorrect set-out garbage was equated visually to an equivalent garbage bag amount. For further information please refer to bag equivalent chart in Appendix 1 and the Waste By-Law in Appendix 2.

2.3.2 Curbside Blue Box and Grey Box Monitoring

Blue and Grey Box data was recorded as the number of boxes, in half increments, set-out at the curb. The recyclable material set-outs were recorded under two headings, correct or incorrect with a comment on why it was incorrect. Refer to the recycling pamphlet in Appendix 2 in order to view the correct set-out information.

2.3.3 Curbside Yard Waste Monitoring

Yard waste was evaluated in terms of bags, cans, and bundles. This was recorded under two headings, correct and incorrect. Refer to the yard waste pamphlet in Appendix 2 in order to view the correct set-out information.

2.3.4 Bulky Items

Bulky items were evaluated in terms of bag equivalent, which was measured visually by staff. Bulky items required two people to load the item into the waste collection vehicle. Refer to the bag equivalent chart in Appendix 1.

2.4 Data Collection Material/Equipment

- Two Regional Pickup trucks
- One Regional Car (rented from Fleet Services)
- Data Collection Sheets
- Clipboard, pencils, maps
- Safety Equipment (work boots, safety vests, gloves, hard hats)
- Walkie-talkies
- Access Database

2.1 Notification of Public

A Project Update was provided to Regional Councillors and Wasteline Customer Service staff prior to the start of the study. The field staff were given a script to follow when approached by residents while conducting the study. Field staff were instructed to give a brief description of the study and to direct residents with further questions to the Wasteline. A copy of these communication pieces is located in Appendix 3.

3.0 RESULTS

The key findings of the six month Region-wide study are listed in Table 2 with detailed results in Appendix 4. The Set-Out Study Database can be located on the Region of Peel Network at K:/Public_Works/Programs/Waste/Miscellaneous/SetOutStudy. The average garbage set-out per household was 2.1 bag equivalents per week. Refer to Figure 1 for a graph that details the seasonal variation in garbage set-out rate with the peak occurring in May at 2.6 bag equivalents and steadily declining into the fall to 1.7. Refer to Figure 2 for a graph of the average percentage of set-out rates by bag equivalent per week. Refer to Figure 3 for the average set-out rate for each household per week by housing type with the greatest average set out occurring at farm households with an average of 7.0 bags per week, followed by new estate households at 2.4 bags per week. On average 38% of the total households sampled set out bulky items each week.

Figure 1: Seasonal Variation in Garbage Set-Out Rate

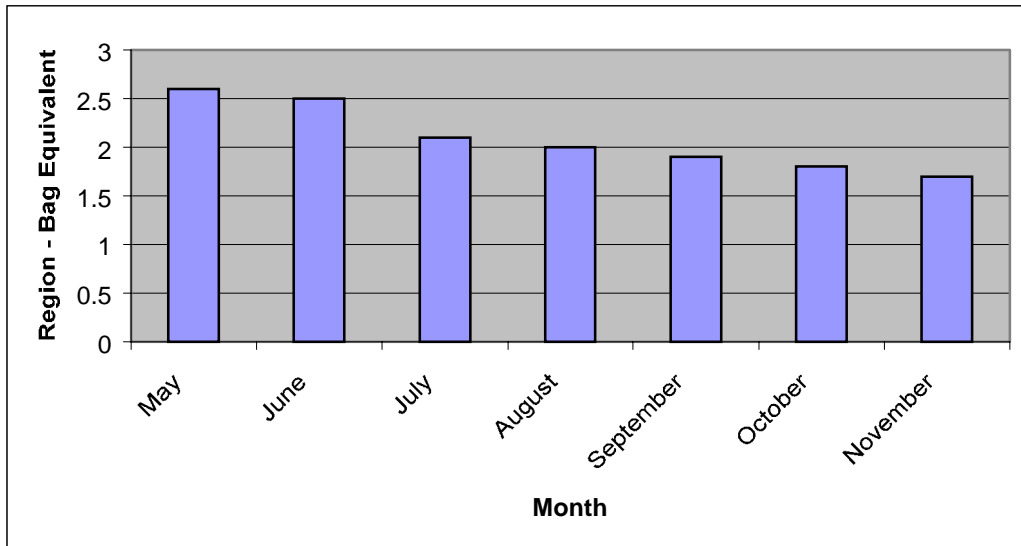


Figure 2: Average Percentage of Set-Out Rates by Bag Equivalent per Week

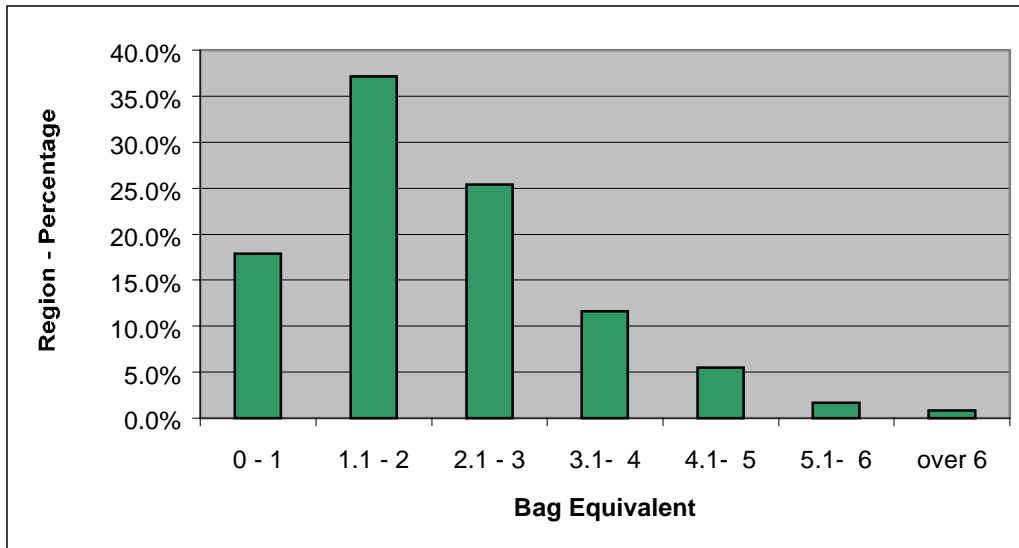


Figure 3: Average Garbage Set-Out Rate by Housing Type

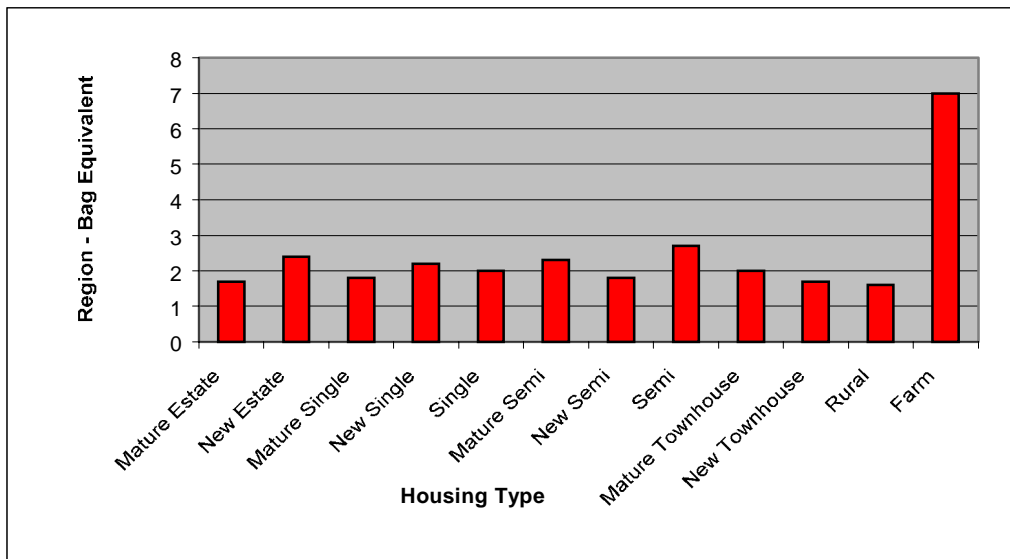


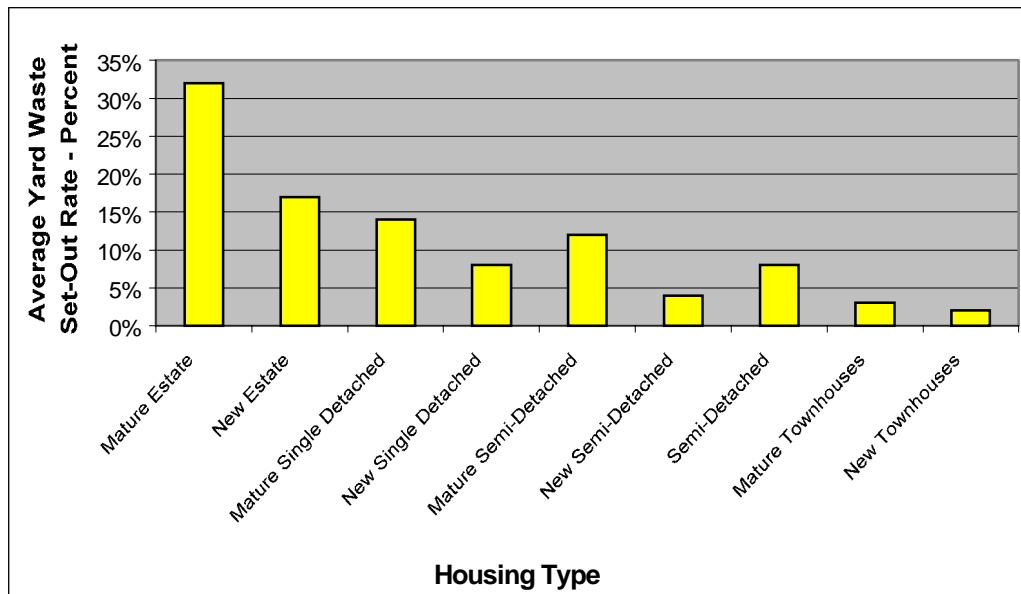
Table 2: Key Findings of the Residential Curbside Set-Out Study

Average Garbage set-out (bag equivalent)	2.1
Households with set-outs less than or equal to 2 bags	55.1%
Households with set-outs less than or equal to 3 bags	80.4%
Households with a bulky set-out	38%
Average Yardwaste set-out (bag equivalent)	0.3
Households with a yardwaste set-out	71%
Average Recycling container set-out (bag equivalent)	0.8
Households with a recycling container set-out	61.6%

The average recycling container set-out per household was 0.8 containers per week. On average 61.6% of the households set-out a recycling container per week. There was not a seasonal variation in the recycling container set-out. The implementation of the Grey Box Program the week of September 11th resulted in a decline in the average garbage set-out per household from 2.2 to 1.8 bag equivalents per week. The number of households that set-out a recycling container each week increased from 60.0% to 64.5% after the implementation of the Grey Box Program.

The average correct yard waste set-out per household in Brampton and Mississauga combined was 0.3 bag equivalents per week. On average 71.0% of the households set out yard waste each week, with 74% of that yard waste set out according to by-law 80-96 that regulates the collection of waste in the Region of Peel (Appendix 2). Figure 4 demonstrated the proportions of yard waste set out by housing type. On average 40% of the households set out grass each week, with 70% of the grass set out correctly with the yard waste.

Figure 4: Average Yard Waste Set-Out by Housing Type



4.0 CONCLUSIONS AND RECOMMENDATIONS

Initial results indicate that there was a decline in the average garbage set out from 2.2 to 1.8 with the recycling set out increasing from 60.0% to 64.5% of the households over the two month period following the implementation of the Grey Box Program. As a result, the program has been successful in its objectives to increase diversion of recyclable materials and at the same time decrease the amount of garbage set out at the curb for disposal.

The implementation of a 3-bag limit should not have an impact on 80.4% of the households in the Region of Peel. The implementation of a grass collection ban at the curbside should not have an impact on 60.0% of the households in the Region of Peel.

It is recommended that the Curbside Set-Out Study be repeated in 2001. New programs are planned for implementation in 2001 and the information recorded in the database will be helpful in planning and monitoring these programs. Information gathered during and following the implementation of a new program provides staff with guidance on the success of the program or areas for improvement. As the Long Term Waste Resource Management Strategy is implemented the Set-Out Study results will benchmark the changes in material streams and amounts set out to the curb for collection by the residents of Peel.

5.0 TRANSFERABILITY TO OTHER REGIONS/MUNICIPALITIES IN ONTARIO

Overall, other municipalities will find the results of this project useful in planning their own bag limit program, grass ban or any other waste diversion program. The compiled data provides information on the frequency, amount and seasonal patterns of materials set-out to the curb, which municipalities could utilize for comparison purposes or justification needs.

REFERENCES

Mississauga/Brampton Curbside Study for Yard Waste & Blue Box Materials, October 18, 1996, Regional Municipality of Peel

Designing and Conducting Survey Research, 1992, Rea and Parker