

**CART RECYCLING PILOT PROJECT  
E&E Project 262**



**ESSEX-WINDSOR  
SOLID WASTE AUTHORITY**

December 2008

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**Essex-Windsor Solid Waste Authority  
Recycling Cart Pilot Project – E&E #262**

**Executive Summary**

Essex Windsor Solid Waste Authority (EWSWA) operates a 2-stream recycling system. Staff applied for and received funding from Stewardship Ontario's Effectiveness and Efficiency Fund to test the use of a cart-based collection system. Five hundred households in Essex-Windsor were provided with two 35 gallon recycling carts, one for fibres and one for containers. The pilot project was implemented in two main areas: The Town of Tecumseh (rural and urban) and the City of Windsor. Carts were distributed in May and June 2007. Pre and post waste and recycling surveys were completed in both rural and urban Tecumseh pilot areas and in the City of Windsor pilot area. Pre and post waste/recycling audits were carried out in both Tecumseh areas. Time studies for recycling collection were conducted pre-cart delivery for both rural and urban Tecumseh routes as well as the City of Windsor pilot area.

Cart collection was semi-automated using side-loading trucks with 2 compartments (fibres and containers) and compaction on both sides. Carts were tipped one after the other.

The overall average participation rate for all pilot areas increased by 9%. Overall capture rate for accepted materials increased by 8% (9% for the rural area and 7% in the urban area based on waste audit results).

Collection time in Windsor increased almost 200% after the introduction of the carts. This was most likely due to the manner in which the recyclables were loaded into the truck: instead of manually emptying carts, drivers must use the lift mechanism to empty the carts.

A satisfaction survey was administered and indicates nearly all participants supported the cart pilot project on the basis that the recycling carts were easier and neater to use than the red and blue boxes. The results also indicated that if the cost of purchasing the cart was to be placed on the resident, they would prefer to stay with the current bin system.

The failure of the cart pilot project to generate a substantial increase in material capture, and by extension, in material revenue, is the single most important factor resulting from the study. According to EWSWA staff, a minimum 15-20% increase would have been necessary to justify a switch to the cart system. While the accurateness of the information gathered on time studies through this project may be questionable, the bottom line is that regardless of the magnitude of the increase in costs, the related additional revenues anticipated from the introduction of the carts would do little to offset the additional costs.

Finally, because the carts were so well received by the residents participating in the pilot studies, the Authority is considering purchasing a small quantity and making them available to residents on a cost recovery basis during their truck-load sale which run twice yearly.

## **1.0 Introduction**

Essex-Windsor Solid Waste Authority (EWSWA) operates a 2-stream recycling program. Materials are collected on a bi-weekly basis using 14-gallon boxes – a red box for fibres and a blue box for containers. The program also accepts motor oil – residents may place one clearly marked 4L bottle beside their recycling container each collection cycle.

The Board of the Essex-Windsor Solid Waste Authority (EWSWA) approved a Cart Recycling Pilot Project as part of the 2007 budget in response to the following issues:

- The relative small size of the red and blue recycling boxes;
- Litter and spill-over caused by overflowing red and blue boxes;
- Relatively low resident participation in recycling program.

In addition, it was expected that this project would provide useful information to assist EWSWA to assess:

- The potential need for more curb-side capacity;
- The potential impact of increased capacity;
- The potential for recycling carts to replace the current red and blue recycling boxes;
- The potential to increase resident participation in the recycling program through the provision of larger recycling carts;
- The potential to increase diversion through provision of larger recycling carts;
- The potential to increase the capture rate of recyclable materials through the provision of larger recycle carts;
- The impacts on driver productivity resulting from the use of recycling carts.

EWSWA staff applied for and received funding from Stewardship Ontario's Effectiveness and Efficiency Fund to provide about 500 households in Essex-Windsor with two 35 gallon recycling carts: one cart for paper fibres and the other for containers. The two-cart option is one of a number of options being considered to address the issues outlined above. Some of the other options (e.g. a larger blue box, one cart) are discussed briefly in this report; however the focus of the report is on the results from the two-cart pilot.

## **2.0 Description of Pilot Project**

The following characteristics were used as a guide when selecting the households for the pilot project:

- Consist of single family dwelling, with no more than 10% of the housing being townhouse style or semi detached dwellings to reflect average housing conditions in Essex-Windsor;
- Consist of a mix of rural and urban households to represent both communities within the area;
- Consist of a blend of housing stock to provide a range of tenancy and years of ownership;
- Be geographically distinct with garbage collection and recycling routes that do not overlap with other neighborhoods;
- Have distinct postal codes to facilitate communication.

The pilot project was implemented in two main areas: The Town of Tecumseh and the City of Windsor. In the Town of Tecumseh, 374 households were chosen from 2 sub-areas: a rural community where 122 dwellings were chosen and an urban setting where 252 dwellings were chosen to participate. In the City of Windsor, results were collected from a total of 120 households.

Prior to the commencement of pilot project surveying, households selected for the study were hand delivered informational brochures and pamphlets outlining recycling procedures for the area, including acceptable materials for both the fibre cart and the container carts. Residents also received an informative letter outlining the purpose of the pilot project, anticipated start dates for surveying and cart delivery along with dates for two information sessions held by the EWSWA and contact information for EWSWA.

Waste and recycling surveys were completed prior to cart delivery in May and June 2007 in both rural and urban Tecumseh pilot areas and in the City of Windsor pilot area. Waste surveys involved surveying the amount of waste (number of bags, size of bags, bulk items) placed curbside for pickup. Recycling surveys involved assessing the amount of recycling (number of boxes, fullness of boxes, etc.) placed curbside.

Waste/recycling audits were carried out in both Tecumseh areas. The sample consisted of the first 25 participating households in each Tecumseh area. Table 1 outlines the material categories used for both the waste and recycling audits. No waste/recycling audits were carried out in Windsor due to limited resources and timing issues.

**Table 1: Categories used for garbage and recycling audits.**

<b>PAPER</b>	<b>GLASS</b>
Newspaper – Other	LCBO Clear & Coloured
Telephone Books / Directories	Clear
Magazines & Catalogues	Coloured
Mixed Fine Paper	Other Glass - Bottles & Jars
Books	<b>CONTAMINATION</b>
Other Paper	Red Box Contamination
<b>PAPER PACKAGING</b>	Blue Box Contamination
Corrugated	<b>HOUSEHOLD SPECIAL WASTE</b>
Kraft Paper	Batteries
Boxboard / Cores	Paint & Stain
Molded Pulp	Motor Oil
Paper Cups and Ice-Cream Containers	Other HSW liquids
Laminated Paper Packaging	Other HSW
Composite Cans	<b>ORGANICS</b>
Gable Top Cartons	Food Waste
Aseptic Containers	Yard Waste
Tissue/Toweling	Pet waste
<b>PLASTICS</b>	<b>OTHER MATERIALS</b>
Other Bottles & Jugs (PET & HDPE)	Diapers and Sanitary Products
Polystyrene Packaging	Textiles
Wide Mouth Tubs & Lids	Carpeting
Large Pails & Lids	Construction & Renovation

Polyethylene PE Plastic Bags & Film Packaging	Computer / IT Equipment
Polyethylene PE Plastic Bags & Film Non-Packaging	Telecom Equipment
Durable Plastic Products	TV & Audio Equipment
<b>METALS</b>	Small Kitchen Appliances
Aluminum Food & Beverage Cans	Other Electronics
Aluminum Foil & Foil Trays	Ceramics
Other Aluminum Containers - Beer Cans	Furniture
Steel Food & Beverage Cans	Other Large Bulky Items
Steel Aerosol Cans	Other Waste
Steel Paint Cans	
Other Metal	

Time studies for recycling collection were conducted pre-cart delivery for both rural and urban Tecumseh routes as well as the City of Windsor pilot area.

EWSWA delivered two recycling carts to each participating household at the end of June 2007.

After cart delivery, the same survey methods were used to collect data in the pilot areas. Rural and urban Tecumseh pilot areas and the City of Windsor pilot areas were surveyed for participation in curbside pickup of both recycling and waste. Time studies were also carried out in both areas to determine route duration and driver function. Waste and recycling audits were only performed for the rural and urban Tecumseh pilot areas.

Survey questions were sent to all participating residences to obtain information regarding their opinion on the recycling program, the use of the carts, convenience of carts and overall experience. A similar survey was administered to the recycling truck drivers who participated in route pickup and time studies in both Tecumseh and City of Windsor pilot areas.

Pre-cart delivery survey and audit data was compiled during the months of May and June 2007. EWSWA delivered two recycling carts to each participating household at the end of June: 120 in Windsor and 374 in Tecumseh. The number of participants changed slightly throughout the pilot project as a result of some residents not wanting to participate once the project began and others being added because the houses were overlooked when the sample was chosen for the pilot project. Follow-up surveys, audits, and collection time studies were completed during the months of July and August 2007.

Cart collection was semi-automated using side-loading trucks with 2 compartments (fibres and containers) and compaction on both sides. Carts had to be tipped one after the other. Figures 1 and 2 below illustrate the mechanism.



### 3.0 Participation Rates

Households were considered to have participated in the recycling program if they set a blue/red box or cart out for recycling collection at least once during a four week generation period.(i.e. two full collection cycles). Participation data was collected through recycling surveys whereby summer students recorded the number and quantity of recycling containers placed curb side in both the Tecumseh rural and urban areas and the City of Windsor pilot area. Refer to Appendix A: Data Table 1.1 – 1.5 for participation survey results. Participation rates were measured both “pre” cart delivery in May and June 2007 and “post” cart distribution in July and August 2007. The participation results for the Cart Pilot are presented in table 1 below.

**Table 1: Participation Results Pre and Post Carts**

<b>Pilot Area</b>	<b>Sample Size (# of HHs)</b>	<b>Pre Carts (Avg. %)</b>	<b>Post Carts (Avg. %)</b>
Windsor	120	66	81
Tecumseh Urban	252	84	86
Tecumseh Rural	122	67	77
Avg. Participation Rate		72	81

The most significant increase in participation occurred in the Windsor pilot area where an additional 18 households participated after the introduction of the carts. These additional households were not placing recyclables out prior to the delivery of the carts. In the Tecumseh pilot area, the rural area experienced an increase in participation of 10% while the urban area experienced a marginal increase of 2%. The overall average participation rate for all pilot areas increased by 9%. Possible reasons for some of the increases in participation could be that the residents were receiving promotional material and became more aware; that they participated because they knew that they were being studied; that the pilot project took place in the summer therefore the warm weather could be the reason for the increase.

#### 4.0 Diversion Rates

A fundamental premise for undertaking the pilot project was the potential impact the new carts might have on recycling diversion rates. Diversion rates were calculated in order to determine the effectiveness of the carts at reducing waste and increasing recycling.

$$\text{Diversion Rate} = \left[ \frac{\text{Total weight of material Recycled}}{\text{Total weight of garbage} + \text{Total weight of material Recycled}} \right] \times 100$$

This data was obtained based on weights recorded during the Tecumseh waste and recycling audits prior to cart delivery in May 2007 and after cart delivery in August 2007 (refer to Appendix A: Data Tables 1.6 and 1.7). The pre and post diversion rates are presented in Table 2. As mentioned previously, no audits were conducted in the Windsor pilot area and therefore diversion rates for this pilot area are not available.

**Table 2: Pre and Post Recycling Diversion Rates**

Area	Pre Carts Diversion Rate* (%)	Post Carts Diversion Rate* (%)	% Change
Tecumseh Urban	28	37	9
Tecumseh Rural	21	29	8
Average			9

\*results based on garbage and recycling waste audit data from 25 homes in each area over a four-week generation period

The average increase in recycling diversion rate for both Tecumseh pilot areas was 9%.

#### 5.0 Capture Rates

The increase in capture rate of recyclable material is outlined as one of the desired results from the introduction of carts to the recycling program. The convenience of the carts, with their lids and wheels, may increase residents' willingness to recycle. Also, a larger recycling container may increase the opportunity for residents to recycle more materials, more effectively. Table 3 presents the pre and post capture results. Raw audit data can be found in Appendix A, Data Table 1.6 and 1.7.

**Table 3: Capture Rates Pre and Post Carts (by material type)**

	Pre Carts (May 2007)			Post Carts (August 2007)		
	Tecumseh Rural	Tecumseh Urban	Average	Tecumseh Rural	Tecumseh Urban	Average
ONP	87%	96%	91%	94%	94%	94%
Mixed Fine Paper	60%	76%	68%	56%	83%	70%
OCC	78%	94%	86%	85%	90%	88%
OBB	54%	72%	63%	67%	88%	77%
PET- HDPE	36%	77%	57%	72%	88%	80%
Aluminum	36%	60%	48%	50%	94%	72%
Steel	40%	74%	57%	71%	50%	60%
Glass	37%	38%	38%	71%	94%	83%
Overall BB capture rate**	67%	80%	73%	76%	87%	82%

\*results based on garbage and recycling waste audit data from 25 homes in each area over a four-week generation period  
 \*\* the average Includes all materials accepted in the EWSWA's Blue Box program, not just the select materials listed in the table

The waste audit results suggest that capture rates for glass, PET/HDPE and aluminum increased after the introduction of the carts. While the increase in PET/HDPE capture can possibly be attributed to increased beverage consumption typically associated with the heat of the summer months, it is likely, based on the assumption that the lack of capacity keeps people from recycling more, that the additional capacity provided by the carts resulted in increased capture. Capture rates for ONP, mixed fine paper, OCC, OBB and steel cans also increased after the introduction of the carts, but only slightly. Overall capture rate for accepted materials increased by 8% (9% for the rural area and 7% in the urban area).

## 6.0 Time Studies

Time and motion measurements were made to assess the time difference between collecting recyclables set out in carts versus collecting recyclables set out in blue/red boxes. Four time studies (2 pre carts and 2 post carts) were undertaken in Windsor. In the Tecumseh urban area, although three pre-cart time studies were conducted, only one set of post-cart time study data is available due to communication problems with collection drivers and mechanical difficulties with the trucks. In the rural Tecumseh pilot area, 3 pre and post time studies were carried out.

EWSWA staff followed the collection truck and recorded what the vehicle operator was doing by placing a tick (every 10 seconds) in the appropriate column on the log sheet (e.g. driving, loading materials, etc) . At the end of a one hour monitoring period, the number of ticks were summed for each activity and the total collection time was proportioned by the relative number of ticks for each activity. The averaged results of the time studies are presented in table 4 below. Please refer to Appendix A, Data Table 1.8 for raw data obtained from the time studies.

**Table 4: Time Study Results: Average Time Spent for Each Activity (in minutes)**

		Total Time	Drive	Walk Without Load	Load Fibres	Load Containers	Material Rejection	Cycle/ Compact	Used Oil Collect.	Break
PRE Cart Delivery	Rural Tec.	76	47.3	12.0	8.3	8.3	0.0	0.0	0.0	0.0
	Urban Tec.	114	39.6	14.3	31.7	23.8	1.6	1.6	0.0	1.6
	Windsor	20	7.0	1.7	5.2	4.3	0.9	0.0	0.9	0.0
POST Cart Delivery	Rural Tec.	103	50.7	5.1	22.0	20.3	1.7	1.7	1.7	0.0
	Urban Tec.	201	43.6	17.1	79.6	56.9	1.9	0.0	1.9	0.0
	Windsor	60	9.5	9.5	21.1	16.8	0.0	1.1	1.1	1.1

Although the data set is small, based on these numbers collection time in Windsor increased almost 200% after the introduction of the carts. One reason for this dramatic increase may have been the manner in which the recyclables were loaded into the truck: instead of manually emptying carts, drivers must use the lift mechanism to empty the carts. As the numbers in Table 4 indicate, time spent loading fibres and containers into the truck increased considerably more than the time spent in all other areas of activity for Windsor.

Notwithstanding the challenges outlined above, the general results for the urban Tecumseh time-study are fairly consistent with the results from the rural Tecumseh and Windsor pilot areas. Urban

Tecumseh pilot areas showed a 64% increase in collection time, which is comparable to the 58% increase for urban Tecumseh.

## **7.0 Participant Survey and Results**

One percent of pilot area residents declined to participate in the cart pilot project all together. Most were senior citizens who informed us that they generated little recyclables. Of the 374 participating households, 48% responded to a three page Satisfaction Survey. The results of the participant survey indicate that nearly all participants supported the cart pilot project on the basis that the **recycling carts were easier and neater to use than the red and blue boxes**. Specific survey results are outlined below.

The results of the participant survey indicated the following:

- 92% (162 out of 176) indicated that, if given the opportunity they would continue to use the carts;
- The top three reasons for satisfaction with recycling carts were:
  - Easy to move
  - Large capacity and
  - Lids – keep things contained
- 40% (72 out of 180) indicated that they recycled more after receiving the recycling carts
- 73% (105 out of 143) of respondents indicated that they could see no disadvantage to the carts;
- 15% (22 out of 143) of respondents indicated that the only disadvantage to the carts related to storage problems
- When asked about set-out frequency:
  - 14% (25 out of 175) indicated that they set the recycling cart out less frequently than their recycling boxes;
  - 16% (28 out of 175) indicated that they set out the recycling carts more frequently than their recycling boxes;
  - 70% (122 out of 175) indicated that they set out the recycling carts at the same frequency as they had their recycling boxes
- Prior to the introduction of the cart pilot project;
  - 56% (101 out of 180) indicated that they put out 2 or less recycling boxes for bi-weekly collection
  - 44% (70 out of 180) put out 3 or more red and/or blue boxes
- Faced with an option of having only one recycling cart:
  - 70% of residents indicated that they would use it for paper fibre
  - 30% indicated that they would use it for containers
- 79% of the participants indicated that they would not pay \$50 for a recycling cart – 21% indicated otherwise (i.e. that they would purchase carts at this price)
- The majority of those who stated that they would pay \$50 for a recycling cart were also those setting out 3 or more boxes prior to the cart pilot project.

Based on these results it is clear that the ideal recycling container varies depending on resident's specific needs. Examples of some of these variables include: number of residents living in the house, space availability (e.g. if they have a garage or carport), subscription to a daily paper, number of children in the household, etc. The results also indicated that if the cost of purchasing the cart was to be placed on the resident that they would rather stick with what they already have. For the most part residents don't want to have to pay for containers. They believe that if the

government wants them to recycle more and more effectively, that the government should cover the cost.

## **8.0 Collection Truck Driver Survey**

The pilot project coordinator surveyed two collection truck drivers (Tecumseh rural and urban drivers) through an informal interview after the pilot project was completed. In general, the drivers indicated they found the carts easy to use; however some potential issues were also identified:

- Problems during the winter months when carts would be less accessible and more prone to tipping over due to snow and snow banks;
- Cross-contamination of both recycling and garbage increased with the carts according to the driver's observation and opinion (similarly, drivers expressed concern that the distribution of one cart would lead to high levels of cross contamination)
- Collection time is likely to double due to the additional time required to bring the cart to the truck, hook it on to the truck, dump it, and return the cart to its original location. In fact, County drivers on many occasions simply lifted the container cart and dumped it instead of hooking it onto the truck and using the mechanical lifter in order to save time.

## **9.0 Economic Impact**

To assess the economic impacts associated with implementing a county-wide cart-based recycling system, a Cost Benefit Analysis of the introduction of two 35 gallon carts to all 150,519 households in Essex Windsor was carried out and is presented in Table 5. The assumptions behind the main expense and revenue categories are summarized below.

### *Capital Costs*

For the purposes of the study, 35 gallon roll-out carts were purchased at a price of \$37.50 per cart. Although it may be possible to obtain a better price based on the purchase of over 300,000 carts (2 carts for all 150,519 households), the figure of \$37.50 was used for the purposes of this analysis. The total cost for carts is therefore estimated at \$11,288,925. For the purposes of the analysis, the cost of the carts was amortized over 10 years.

According to the study results, the time required to complete collection with the cart system increases anywhere from fifty percent to triple the base time. For the purposes of the Cost Benefit Analysis, the collection time doubles as do all the related operating costs. A doubling of the collection fleet increases the number of trucks required from 20 to 40 trucks. Trucks used for collection currently are side-loading compaction vehicles which cost approximately \$225,000 per unit. Since the truck replacement policy of the Authority is 7 years, annualized capital cost is based on 7 year depreciation. Based on these values, total truck capital costs would increase from \$4.5 million to \$9 million dollars or an annualized capital cost of \$1,285,714.00. This analysis does not consider other potential options such as additional collection hours since the existing fleet already operates from 7:00 am to 5:00 pm daily. For the purposes of the comparison, the analysis is based on the provision of all new capital although in reality the existing trucks may be anywhere from one to 7 years old.

### *Operating Costs*

The doubling of the fleet size also results in a doubling of the costs related to the operation of the fleet. This includes collection cost, truck repairs and maintenance, fuel, licenses, insurance,

and radios. This results in an operating cost increase from approximately \$3 million per year to \$6 million per year. Other costs related to the introduction of carts include an annual replacement cost for broken carts of \$56,250 (based on the purchase of 1,500 carts @ \$35.50) and a P&E charge of \$45,155 (150,519 households @ \$0.30 per household).

*Revenue*

The tonnage increase – and by extension – the revenue increase as a result of the introduction of the carts county-wide is estimated at 8%. Based on the 2007 tonnage of 27,125, we anticipate receiving an additional 2,170 tonnes of recyclable material at a “basket of goods” revenue price of \$141.72 per tonne or total additional revenue of \$307,532.40.

<b>Table 5: Cost / Benefit Analysis</b>		
<b>The following table is based on 2007 actuals</b>		
	<b>Base</b>	<b>Cart - Full Scale</b>
<b><u>EXPENSES</u></b>		
<b><u>Operating Costs</u></b>		
Collection Cost	\$1,861,863.00	\$3,723,726.00
Fleet Repair & Maintenance	740,141.00	1,480,282.00
Fuel	335,223.00	670,446.00
Airtime / Radios	8,424.00	16,848.00
Licenses / Permits	15,511.00	31,022.00
Vehicle Insurance	91,897.00	183,794.00
<b>Total Operating Costs</b>	<b>\$3,053,059.00</b>	<b>\$6,106,118.00</b>
<b><u>Capital Cost</u></b>		
Annualized Truck (\$225,000/unit ÷ 7 years)	20 trucks 642,857.14	40 trucks 1,285,714.00
Acquisition Cost (10 year depreciation) 150,519 households (x2) X \$37.50/cart	—	1,128,892.50
Cart Replacement (1,500 carts)	(Box Replacement) 25,346.00	56,250.00
Public Education / Advertising (.30 / hshld.)	—	\$45,155.70
<b>Total Operating Costs</b>	<b>\$ 668,203.14</b>	<b>\$2,516,012.20</b>
<b>TOTAL COSTS</b>	<b>\$3,721,262.00</b>	<b>\$8,622,130.20</b>

While other cart pilot projects have found that cart-based collection presents a great advantage from a worker health/ergonomics point of view (e.g. Toronto – refer to E&E project 60), this aspect did not factor in to the Authority's decision as it does not employ collection staff but rather contracts with the private sector for collection services.

The failure of the cart pilot project to generate a substantial increase in material capture, and by extension, in material revenue, is the single most important factor resulting from the study. According to EWSWA staff, a minimum 15-20% increase would have been necessary to justify a switch to the cart system.

While the accurateness of the information gathered on time studies through this project may be questionable, the bottom line is that regardless of the magnitude of the increase in costs, the related additional revenues anticipated from the introduction of the carts would do little to offset the additional costs.

## **10.0 Alternate Options**

Options to mitigate the costs outlined in the analysis above were considered by EWSWA. One option involved charging a \$50 per cart fee to residents. However, survey results indicated 79% of respondents were opposed to paying such a fee. The survey did not probe on the actual amount, if any, residents would be willing to pay.

Another option that was considered was the provision of one free cart per household, instead of two. As indicated in the participant survey results, if only one recycling cart was distributed, 70% of participants indicated that they would utilize the cart for their paper fibres. However, a major issue identified at the beginning of this report is the problem of too little volume in the current blue and red box system. This lack of capacity would likely be exacerbated if the cart was used for fibres, given that containers typically take up the majority of the volume. Moreover, drivers expressed a concern based on their observation during the pilot that the distribution of one cart would lead to high levels of cross contamination.

## **11.0 Conclusion**

While the carts appeared popular among residents and drivers, the amount of additional time required to complete daily collection would result in a significant increase in both operating and capital costs. While the capital cost of providing carts to residents could be mitigated by charging a fee for the cart, this concept was unpopular to the majority of participants.

Despite the drawbacks of a cart based program, almost half of survey participants are currently using more than 2 boxes, and a cart system would therefore address the issues of convenience and capacity, thereby having a positive impact on recycling participation and diversion.

As part of the 2007 budget deliberations, Authority staff proposed the use of larger 22 or 24 gallon blue boxes as a means to increase capacity for local residents. At the time, this proposal was not supported due to the presence of glass in the blue box and the related weight issue. However, this decision was made prior to the introduction of the LCBO Deposit Return Program in February

2007. Since the introduction of the LCBO Program, Essex-Windsor has experience a 58% decrease in the amount of glass collected in the blue box.

The budget allocation for the purchase of Blue and Red boxes for 2007 has already been expended. The 2008 budget recently approved by the Board includes \$98,000 for the purchase of replacement and resale Blue and Red boxes. Historically the Authority has purchased and distributed 14 gallon Blue and Red boxes at a cost of approximately \$5 each, however larger 22 and 24 gallon boxes are available from manufacturers at approximately \$7 each. The Authority has decided to make these bigger Blue Boxes their standard program box (i.e. the boxes sold to residents from now on will be 24 gallon instead of 14 gallon). This will increase the capacity of a household to recycle without the significant increased capital and operating costs associated with a cart based recycling program.

Finally, because the carts were so well received by the residents participating in the pilot studies, the Authority is considering purchasing a small quantity and making them available to residents on a cost recovery basis during their truck-load sale which run twice a year.

## Appendix A – Data Tables

**Data Table 1.1: Tecumseh Recycling Participation Results (Pre Carts) – May 2007**

<b>Rural – Area 1 – Former Sandwich South (Walker Rd.)</b>			
<b>Date</b>	<b>15-May</b>	<b>29-May</b>	<b>Total</b>
<b>THP/TH</b>	51/122	58/122	69/122
<b>%</b>	42%	48%	57%
<b>Urban - Area 2 - Former Tecumseh &amp; St. Clair Beach (LaCasse Blvd.)</b>			
<b>Date</b>	<b>18-May</b>	<b>1-Jun</b>	<b>Total</b>
<b>THP/TH</b>	157/252	176/252	195/252
<b>%</b>	62%	70%	83%

THP= Total Households Participating  
 TH = Total Households

**Data Table 1.2: Tecumseh Recycling Participation Results (Pre Carts) – June 2007**

<b>Area 1 - Former Sandwich South (Walker Rd.)</b>			
<b>Date</b>	<b>12-Jun</b>	<b>26-Jun</b>	<b>Total</b>
<b>THP/TH</b>	66/122	70/122	90/122
<b>%</b>	54%	57%	74%
<b>Area 2 - Former Tecumseh &amp; St. Clair Beach (LaCasse Blvd.)</b>			
<b>Date</b>	<b>15-Jun</b>	<b>29-Jun</b>	<b>Total</b>
<b>THP/TH</b>	196/252	186/252	226/252
<b>%</b>	78%	74%	90%

THP= Total Households Participating  
 TH = Total Households

**Data Table 1.3: Tecumseh Recycling Participation Results (Post Cart Delivery), July 2007**

<b>Rural - Area 1 - Former Sandwich South (Walker Rd.)</b>			
<b>Date</b>	<b>10-Jul</b>	<b>24-Jul</b>	<b>Total</b>
<b>THP/TH</b>	81/122	67/122	101/122
<b>%</b>	66%	55%	83%
<b>Urban - Area 2 - Former Tecumseh &amp; St. Clair Beach (LaCasse Blvd.)</b>			
<b>Date</b>	<b>13-Jul</b>	<b>27-Jul</b>	<b>Total</b>
<b>THP/TH</b>	197/252	182/252	223/252
<b>%</b>	78%	72%	88%

THP= Total Households Participating

TH = Total Households

**Data Table 1.4: Tecumseh Recycling Participation Results (Post Cart Delivery), Aug 2007**

<b>Rural - Area 1 - Former Sandwich South (Walker Rd.)</b>			
<b>Date</b>	<b>7-Aug</b>	<b>21-Aug</b>	<b>Total</b>
<b>THP/TH</b>	48/122	66/122	87/122
<b>%</b>	39%	54%	71%
<b>Urban - Area 2 - Former Tecumseh &amp; St. Clair Beach (LaCasse Blvd.)</b>			
<b>Date</b>	<b>10-Aug</b>	<b>24-Aug</b>	<b>Total</b>
<b>THP/TH</b>	179/252	154/252	211/252
<b>%</b>	71%	61%	84%

THP= Total Households Participating

TH = Total Households

**Data Table 1.5: Windsor Recycling Participation Rates – June (pre carts), July (post carts) and August (post carts) 2007**

**Windsor Recycling Participation Rates - June 2007 (Pre Carts)**

<b>Meldrum Drive</b>			
<b>Date</b>	<b>12-Jun</b>	<b>26-Jun</b>	<b>Total</b>
<b>THP/TH</b>	65/120	51/120	79/120
<b>%</b>	54%	43%	66%

**Windsor Recycling Participation Rates - July 2007 (Post Carts)**

<b>Meldrum Drive</b>			
<b>Date</b>	<b>12-Jul</b>	<b>26-Jul</b>	<b>Total</b>
<b>THP/TH</b>	75/120	92/120	98/120
<b>%</b>	63%	77%	82%

**Windsor Recycling Participation Rates - August 2007 (Post Carts)**

<b>Windsor - Meldrum</b>			
<b>Date</b>	<b>10-Aug</b>	<b>23-Aug</b>	<b>Total</b>
<b>THP/TH</b>	79/120	76/120	96/120
<b>%</b>	66%	63%	80%

THP= Total Households Participating

TH = Total Households

**Data Table 1.6: Tecumseh Recycling Audit Results (Pre-Cart Delivery) May 2007**

Material Category	Accepted Materials	Garbage Stream								Recycling Stream				
		Rural - Area 1 - Former Sandwich South (Walker Rd.)				Urban - Area 2 - Former Tecumseh & St. Clair Beach (LaCasse Blvd.)				Rural - Area 1 - Former Sandwich South (Walker Rd.)		Urban - Area 2 - Former Tecumseh & St. Clair Beach (LaCasse Blvd.)		
		10-May	17-May	24-May	31-May	10-May	17-May	24-May	31-May	15-May	29-May	18-May	1-Jun	
	Net Weight*	Net Weight*	Net Weight*	Net Weight*	Net Weight*	Net Weight*	Net Weight*	Net Weight*	Net Weight*	Net Weight*	Net Weight*	Net Weight*		
		(kg)	(kg)	(kg)	(kg)	(kg)	(kg)	(kg)	(kg)	(kg)	(kg)	(kg)		
<b>PAPER</b>														
Newspaper	x	4.5	3.5	4.0	4.5			2.0	1.5	2.5	44.0	68.0	75.0	58.0
Telephone Books / Directories	x							1.5				0.5		
Magazines & Catalogues	x	3.5								0.5			20.0	
Mixed Fine Paper	x	3.5	4.5	5.0	6.0	4.0	3.0	0.5	1.5	8.5	20.5	8.0	20.5	
Books	x	0.5				0.0								
Other Paper	x													
<b>Total Paper</b>		<b>12.0</b>	<b>8.0</b>	<b>9.0</b>	<b>10.5</b>	<b>5.5</b>	<b>5.0</b>	<b>2.5</b>	<b>4.0</b>	<b>52.5</b>	<b>89.0</b>	<b>103.0</b>	<b>78.5</b>	
<b>PAPER PACKAGING</b>														
Corrugated	x	2.5	0.5	3.0	3.5	0.5	0.5	2.0	0.5	16.5	16.5	17.0	38.5	
Kraft Paper	x	1.5	0.5	1.0	0.5	0.5	1.0	0.5			22.0	0.0		
Boxboard / Cores	x	4.0	4.0	4.5	3.5	2.0	4.5	1.0	2.0	7.0	11.5	10.0	15.0	
Molded Pulp	x	0.5	0.5	0.5	0.0	0.0	0.5	0.0			0.5	0.5	1.0	
Paper Cups and Paper Ice-Cream Containers	x	1.5	1.5	1.0	2.0	0.5	0.5	0.5	0.5			0.0		
Laminated Paper Packaging					0.0	0.0								
Composite Cans									0.0					
Gable Top Cartons		0.5	0.5	0.5	0.0	0.0	0.5	0.0	0.5			1.0	1.0	
Aseptic Containers									0.0					
Tissue/Toweling	x	6.0	1.5	3.0	2.5	1.5	5.5	10.0	2.5					
<b>Total Paper Packaging</b>		<b>16.5</b>	<b>9.0</b>	<b>13.5</b>	<b>12.0</b>	<b>5.0</b>	<b>13.0</b>	<b>14.0</b>	<b>6.0</b>	<b>23.5</b>	<b>50.5</b>	<b>28.5</b>	<b>55.5</b>	
<b>Total Fibre Stream</b>		<b>28.0</b>	<b>16.5</b>	<b>22.0</b>	<b>22.5</b>	<b>10.5</b>	<b>17.5</b>	<b>16.5</b>	<b>9.5</b>	<b>76.0</b>	<b>139.5</b>	<b>130.5</b>	<b>133.0</b>	
<b>PLASTICS</b>														
Other Bottles & Jugs (PET & HDPE)	x	3.0	6.0	7.0	7.0	2.0	2.0	2.0	2.0	6.0	7.0	10.5	16.5	
Polystyrene Packaging		7.5	2.5	5.0	4.5	1.5	2.5	2.5	0.5					
Wide Mouth Tubs & Lids			0.5	0.0		0.0	0.5	0.0				0.0		
Large Pails & Lids		1.0												
Polyethylene PE Plastic Bags & Film Packaging		2.0	5.0	7.0	8.0	3.0	4.0	5.5	2.5					
Polyethylene PE Plastic Bags & Film Non-Packaging		1.5	4.0	3.0	5.0	5.5	2.5	1.0	0.5					
Durable Plastic Products		4.0	2.0	3.5	6.0	10.0	29.0	4.5	1.0					
<b>Total Plastics</b>		<b>19.0</b>	<b>20.0</b>	<b>25.5</b>	<b>30.5</b>	<b>22.0</b>	<b>40.5</b>	<b>15.5</b>	<b>6.5</b>	<b>6.0</b>	<b>7.0</b>	<b>10.5</b>	<b>16.5</b>	
<b>METALS</b>														
Aluminum Food & Beverage Cans	x	0.5	0.5	1.0	1.5	0.5	0.5	0.5	0.5	1.0	1.0	1.0	2.0	
Aluminum Foil & Foil Trays				0.5	0.5	0.5	0.5	0.0	0.0		1.5			
Other Aluminum Containers - Beer Cans	x					0.5	1.0	0.5	0.5				0.0	
Steel Food & Beverage Cans	x	0.5	1.0	2.0	2.5	1.5	1.5	0.5	0.5	2.5	1.5	6.0	5.5	
Steel Aerosol Cans	x	0.5		0.5	0.5	0.5	0.0	0.5	0.5			0.5		
Steel Paint Cans	x													
Other Metal		3.0	5.5	3.5	5.0	0.0	9.0	7.0	3.5					
<b>Total Metal</b>		<b>4.5</b>	<b>7.0</b>	<b>7.5</b>	<b>10.0</b>	<b>3.5</b>	<b>12.5</b>	<b>9.0</b>	<b>5.5</b>	<b>3.5</b>	<b>4.0</b>	<b>7.5</b>	<b>7.5</b>	
<b>GLASS</b>														
LCBO Clear & Coloured	x	2.5		1.0	1.5	6.5	12.5	4.0	7.0			2.5	3.0	1.5
Clear	x		1.5					1.0						
Coloured	x													
Other Glass - Bottles & Jars	x	4.0	0.5	2.5	3.5	0.5	0.5	0.5	0.5	4.5	3.0	7.0	9.0	
<b>Total Glass</b>		<b>6.5</b>	<b>2.0</b>	<b>3.5</b>	<b>5.0</b>	<b>7.0</b>	<b>14.0</b>	<b>4.5</b>	<b>7.5</b>	<b>4.5</b>	<b>5.5</b>	<b>10.0</b>	<b>10.5</b>	
<b>Total Container Stream</b>		<b>11.0</b>	<b>9.5</b>	<b>14.0</b>	<b>16.5</b>	<b>12.0</b>	<b>19.0</b>	<b>8.5</b>	<b>11.5</b>	<b>14.0</b>	<b>15.0</b>	<b>28.0</b>	<b>34.5</b>	
<b>CONTAMINATION</b>														
Red Box Contamination										0.5	3.5	5.0	1.0	
Blue Box Contamination										3.5	2.5	9.5	5.0	
<b>Total Contamination</b>										<b>4.0</b>	<b>6.0</b>	<b>14.5</b>	<b>6.0</b>	
<b>HOUSEHOLD SPECIAL WASTE</b>														
Batteries								0.5						
Paint & Stain														
Motor Oil	x													
Other HSW liquids		0.5				7.5								
Other HSW		6.0	7.0	2.5	3.0		2.0	1.0						
<b>Total HSW</b>		<b>6.5</b>	<b>7.0</b>	<b>2.5</b>	<b>3.0</b>	<b>7.5</b>	<b>2.0</b>	<b>1.5</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	
<b>ORGANICS</b>														
Food Waste		101.5	122.0	115.0	113.5	93.5	92.5	109.0	61.0					
Yard Waste	x	13.0	4.0	7.0	6.0	4.5	18.5	33.0						
Pet waste		24.0	5.5	9.0	11.5	19.0	21.5	22.0	36.5					
<b>Total Organics</b>		<b>138.5</b>	<b>131.5</b>	<b>131.0</b>	<b>131.0</b>	<b>117.0</b>	<b>132.5</b>	<b>164.0</b>	<b>97.5</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	
<b>OTHER MATERIALS</b>														
Diapers and Sanitary Products		6.0	8.5	7.5	9.5	0.5	2.0	0.5	1.5					
Textiles		25.0	12.0	14.0	9.0	4.0	6.0	3.0	3.5					
Carpeting			3.5				13.5	9.0						
Construction & Renovation		5.5	10.5	11.0	9.5	6.5	12.0	10.0	1.0					
Computer / IT Equipment								11.0						
Telecom Equipment														
TV & Audio Equipment														
Small Kitchen Appliances							14.0							
Other Electronics		1.0			2.0				1.0					
Ceramics		0.5				0.5	0.5							
Furniture								12.0						
Other Large Bulky Items							2.5							
Other Waste														
<b>Total Other Materials</b>		<b>38.0</b>	<b>34.5</b>	<b>32.5</b>	<b>30.0</b>	<b>11.5</b>	<b>50.5</b>	<b>45.5</b>	<b>7.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	
<b>Grand Total</b>		<b>241.5</b>	<b>219.0</b>	<b>225.0</b>	<b>232.0</b>	<b>179.0</b>	<b>270.0</b>	<b>256.5</b>	<b>134.0</b>	<b>94.0</b>	<b>162.0</b>	<b>174.0</b>	<b>174.5</b>	

\* based on waste audits of 25 households

**Data Table 1.7: Tecumseh Waste Audit Results (Post-Cart Delivery) August 2007**

		Garbage Stream								Recycling Stream			
		Rural - Area 1 - Former Sandwich South (Walker Rd.)				Urban - Area 2 - Former Tecumseh & St. Clair Beach (LaCasse Blvd.)				Rural - Area 1 - Former Sandwich South (Walker Rd.)		Urban - Area 2 - Former Tecumseh & St. Clair Beach (LaCasse Blvd.)	
Material Category	Accepted Materials	2-Aug	9-Aug	16-Aug	23-Aug	2-Aug	9-Aug	16-Aug	23-Aug	7-Aug	21-Aug	10-Aug	24-Aug
		Net Weight* (kg)	Net Weight* (kg)	Net Weight* (kg)	Net Weight* (kg)	Net Weight* (kg)	Net Weight* (kg)	Net Weight* (kg)	Net Weight* (kg)	Net Weight* (kg)	Net Weight* (kg)	Net Weight* (kg)	Net Weight* (kg)
<b>PAPER</b>													
Newspaper	x	1.5	1.0	1.0	1.5	4.0		2.0		43.0	38.5	41.5	47.0
Telephone Books / Directories	x												
Magazines & Catalogues	x			0.5					1.0	4.0			17.0
Mixed Fine Paper	x	7.0	2.0	2.0	1.5	6.0		1.5	3.0	5.5	8.0	18.0	35.0
Books	x			0.5	1.0								
Other Paper	x												
<b>Total Paper</b>		<b>8.5</b>	<b>1.0</b>	<b>4.0</b>	<b>4.0</b>	<b>10.0</b>	<b>0.0</b>	<b>3.5</b>	<b>4.0</b>	<b>52.5</b>	<b>46.5</b>	<b>59.5</b>	<b>99.0</b>
<b>PAPER PACKAGING</b>													
Corrugated	x	0.5	0.5	3.5	2.0	3.0	1.0	2.5	2.0	22.5	13.5	64.0	16.0
Kraft Paper	x	1.0	2.5			0.5	5.5	1.0					
Boxboard / Cores	x	2.0	1.5	2.5	2.0	1.0	1.0	1.0	0.5	10.0	6.0	12.5	13.5
Molded Pulp	x	0.5	0.5	1.0	0.5	0.0		0.5	0.0	0.5	0.5	0.5	0.5
Paper Cups and Paper Ice-Cream Containers	x	0.5	0.5	0.5	0.5	0.5	1.5		0.0	0.5	0.5	0.0	0.5
Laminated Paper Packaging													
Composite Cans													
Gable Top Cartons		0.5	0.5	1.0	0.5	0.5	0.5	1.0		0.5	0.0	0.5	2.0
Aseptic Containers								1.0	0.5				
Tissue/Toweling	x	7.5		0.5	1.0	5.0	0.5	1.0	6.0				
<b>Total Paper Packaging</b>		<b>12.5</b>	<b>6.0</b>	<b>9.0</b>	<b>6.5</b>	<b>10.5</b>	<b>10.0</b>	<b>8.0</b>	<b>9.0</b>	<b>34.0</b>	<b>20.5</b>	<b>77.5</b>	<b>32.5</b>
<b>Total Fibre Stream</b>		<b>20.5</b>	<b>6.5</b>	<b>12.0</b>	<b>10.0</b>	<b>20.0</b>	<b>9.5</b>	<b>9.5</b>	<b>12.5</b>	<b>86.0</b>	<b>67.0</b>	<b>136.5</b>	<b>129.5</b>
<b>PLASTICS</b>													
Other Bottles & Jugs (PET & HDPE)	x	2.0	2.0	2.5	1.0	1.0	1.0	0.5	0.5	14.5	4.5	11.0	11.0
Polystyrene Packaging		3.5	9.0	3.0	3.0	4.5	1.0	2.5	2.5				
Wide Mouth Tubs & Lids		0.5				0.5	0.5	0.5	0.5				
Large Pails & Lids													
Polyethelene PE Plastic Bags & Film Packaging		1.0	3.0	3.5	0.5		4.0	4.0	3.0				
Polyethelene PE Plastic Bags & Film Non-Packaging		2.0	0.5	3.0	2.5	3.0	4.0	4.0	5.0				
Durable Plastic Products		3.5	1.5	3.5	1.0	4.5	5.5	3.0					
<b>Total Plastics</b>		<b>12.5</b>	<b>16.0</b>	<b>15.5</b>	<b>8.0</b>	<b>13.5</b>	<b>16.0</b>	<b>14.5</b>	<b>11.5</b>	<b>14.5</b>	<b>4.5</b>	<b>11.0</b>	<b>11.0</b>
<b>METALS</b>													
Aluminum Food & Beverage Cans	x	0.5	0.5	1.0	0.5			0.5	0.5	1.5	1.0	2.5	5.0
Aluminum Foil & Foil Trays		0.5		0.5	0.5	0.5		0.5	0.5				
Other Aluminum Containers - Beer Cans	x												
Steel Food & Beverage Cans	x	1.0	0.5	0.5	0.5	0.5	0.5	5.0	0.5	3.0	3.0	3.0	3.5
Steel Aerosol Cans	x	0.5			1.5	0.0	0.5						
Steel Paint Cans	x			1.0								4.0	
Other Metal		2.5		2.0		4.0	6.5	2.0					
<b>Total Metal</b>		<b>5.0</b>	<b>1.0</b>	<b>5.0</b>	<b>3.0</b>	<b>5.0</b>	<b>8.0</b>	<b>8.0</b>	<b>1.0</b>	<b>4.5</b>	<b>4.0</b>	<b>9.5</b>	<b>8.5</b>
<b>GLASS</b>													
LCBO Clear & Coloured	x	0.5								1.0	11.0	1.5	2.0
Clear	x	1.0		1.5	3.0		0.5						
Coloured	x												
Other Glass - Bottles & Jars	x	0.5	3.0			0.5	0.5	0.5		8.0	3.5	11.5	15.5
<b>Total Glass</b>		<b>2.0</b>	<b>3.0</b>	<b>1.5</b>	<b>3.0</b>	<b>0.5</b>	<b>1.0</b>	<b>0.5</b>	<b>0.0</b>	<b>9.0</b>	<b>14.5</b>	<b>13.0</b>	<b>17.5</b>
<b>Total Container Stream</b>		<b>6.0</b>	<b>6.0</b>	<b>6.5</b>	<b>6.5</b>	<b>2.0</b>	<b>3.0</b>	<b>6.5</b>	<b>1.0</b>	<b>28.0</b>	<b>23.0</b>	<b>33.5</b>	<b>37.0</b>
<b>CONTAMINATION</b>													
Red Box Contamination										2.0	2.0	1.0	3.5
Blue Box Contamination										3.5	5.0	3.5	2.0
<b>Total Contamination</b>										<b>5.5</b>	<b>7.0</b>	<b>4.5</b>	<b>5.5</b>
<b>HOUSEHOLD SPECIAL WASTE</b>													
Batteries													
Paint & Stain								1.0					
Motor Oil	x										4.5		
Other HSW liquids					9.0								
Other HSW		1.0	1.5	0.0	9.0	4.0	0.5		0.5				
<b>Total HSW</b>		<b>1.0</b>	<b>1.5</b>	<b>0.0</b>	<b>9.0</b>	<b>4.0</b>	<b>0.5</b>	<b>1.0</b>	<b>0.5</b>	<b>0.0</b>	<b>4.5</b>	<b>0.0</b>	<b>0.0</b>
<b>ORGANICS</b>													
Food Waste		94.0	39.5	42.5	72.5	85.5	66.5	58.0	61.5				
Yard Waste	x		6.0	2.0	6.5	2.0	1.5						
Pet waste		27.0		9.0	0.5	3.0	5.0	5.0	8.5				
<b>Total Organics</b>		<b>121.0</b>	<b>45.5</b>	<b>53.5</b>	<b>79.5</b>	<b>90.5</b>	<b>73.0</b>	<b>63.0</b>	<b>70.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>
<b>OTHER MATERIALS</b>													
Diapers and Sanitary Products		4.0	2.0	1.0	1.0			0.5	0.0				
Textiles		4.5	4.0	22.0	7.0	21.5	48.0	7.0	5.0				
Carpeting							9.0						
Construction & Renovation		17.5	13.5	1.5		30.5	2.5	2.0	4.0				
Computer / IT Equipment													
Telecom Equipment													
TV & Audio Equipment													
Small Kitchen Appliances													
Other Electronics		19.0					0.5						
Ceramics						3.5							
Furniture								15.0					
Other Large Bulky Items				2.0									
Other Waste													
<b>Total Other Materials</b>		<b>45.0</b>	<b>19.5</b>	<b>26.5</b>	<b>8.0</b>	<b>55.5</b>	<b>59.5</b>	<b>25.0</b>	<b>9.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>
<b>Grand Total</b>		<b>207.5</b>	<b>93.5</b>	<b>115.0</b>	<b>121.0</b>	<b>189.5</b>	<b>168.0</b>	<b>123.5</b>	<b>105.0</b>	<b>120.0</b>	<b>101.5</b>	<b>175.0</b>	<b>174.0</b>

\* based on waste audits of 25 households

**Data Table 1.8: Time Study - Tecumseh and Windsor (Pre & Post Cart Delivery)**

Tecumseh													
Rural - Area 1 - Former Sandwich South (Walker Rd.)													
Participation	Date	Start Time	Finish Time	Total Time	Drive	Walk Without Load	Load Fibres	Load Containers	Material Rejection	Compact	Oil	Break	Odometer
67/122	1-May	1:06	2:43	97 mins	205	81	56	52	0	0	2	3	42 km
51/122	15-May	10:39	11:42	63 mins	440	85	57	57	1	3	6	0	n/a
58/122	29-May	11:59	1:06	67 mins	280	63	45	53	0	0	8	0	35 km
48/122	7-Aug	12:08	1:42	94 mins	179	4	90	74	0	0	0	0	33.6 km
66/122	21-Aug	11:54	1:46	112 mins	182	25	72	70	2	1	3	0	34 km
Urban - Area 2 - Former Tecumseh & St. Clair Beach (LaCasse Blvd.)													
Participation	Date	Start Time	Finish Time	Total Time	Drive	Walk Without Load	Load Fibres	Load Containers	Material Rejection	Compact	Oil	Break/ Radio	Odometer
160/252	4-May	12:04	2:03	119 mins	102	95	122	86	9	0	5	9	16 km
157/252	18-May	11:50	1:39	109 mins	126	5	122	91	4				16 km
176/252	1-Jun	1:14	N/A		82	36	71	51		8	2		n/a
Note: June 1st: St.Pierre was picked up already, time study stopped, also driver was extremely tired, much slower than the weeks before													
179/252	10-Aug	12:02	3:40	218 mins	73	9	157	115	0	0	0	0	6 km
Note: Lift was broken, not handling carts properly, carts falling into truck.													
154/252	24-Aug	Never showed up, picked up LaCasse											
189/252	21-Sep	11:37	2:41	184 mins	206	98	349	254	3	0	1	0	6.2 km

Note: Ticks represent 10s intervals for a total duration of one hour

**Windsor (Meldrum Drive)**

**PRE CART**

Date	Start Time	Finish Time	Total Time	Drive	Walk Without Load	Load Fibres	Load Containers	Material Rejection	Compact	Oil	Break	Odometer
14-Jun	12:15	12:37	22 mins	46	20	35	26			2		n/a
28-Jun	12:04	12:22	18 mins	50		34	27	1				1km

**POST CART**

Date	Start Time	Finish Time	Total Time	Drive	Walk Without Load	Load Fibres	Load Containers	Material Rejection	Compact	Oil	Break	Odometer
10-Aug	12:00	12:56	56 mins	49	46	122	108	0	2	2		n/a
23-Aug	1:04	2:07	63 mins	56	59	120	123	0	0	0	3	n/a

## Appendix B: Participant Survey



Essex-Windsor Solid Waste Authority  
1-800-563-3377 Fax: 519-776-6370  
Email: [info@ewswa.org](mailto:info@ewswa.org)  
Website: [www.ewswa.org](http://www.ewswa.org)

### **Recycling Cart – Pilot Project Follow-Up Survey – Win An iPod!**

As part of a pilot project design to 'test' the application of recycling carts, you were one of the households that received two blue recycling carts during the summer. Below is a short survey we are requesting you complete and mail back to us – an addressed envelope has been included – postage has been paid – place the completed survey in the provided envelope and place in the mail. We appreciate your time and efforts with this survey. Without participation from the public we would not be able to test new concepts for recycling collection.

**CHANCE TO WIN!** When we receive your completed survey **you will be entered into a draw to win an iPod.** There are **two** iPods that are going to be raffled off to those homeowners who send in a completed survey. Only 380 people have been sent this survey – your chances of winning are excellent! You could win an iPod the month before Christmas!

**Completed surveys must be received by Friday, November 2<sup>nd</sup>.**

Thank you for your participation and assistance. If you have any questions concerning the survey, please contact Cathie Griffin at 519-776-6441 ext. 228.

**Recycling Cart Update:** As of yet, no decision has been made as to the final outcome of the pilot project. Please continue to use your recycling carts OR you can switch back to your recycle boxes. The choice is yours.

**Please fill out the following information and mail, fax (or submit electronically) with your completed survey – this will be your ballot to win an iPod. (see next page for electronic submission info.)**

Name (First and Last - Please print): \_\_\_\_\_

Address: \_\_\_\_\_

City/Town: \_\_\_\_\_

Postal Code: \_\_\_\_\_

Phone No.: \_\_\_\_\_

**If you would rather complete this survey on your computer electronically;**

- Please go to the following web page:

**<http://www.ewswa.org/pages/Survey.html>**

- Fill in ALL the information fields and follow the directions given on web page.



**1. Did you participate in the blue box program BEFORE you were given carts?**

Yes /  No (please check correct answer)

**2. If not, why?**

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**3. Did you begin to participate in the blue box program AFTER receiving your free carts?**  Yes /  No (please check correct answer)

*(If you did not participate in the recycling cart program you are finished with the survey and do not need to proceed any further – please send your results in)*

**4. If you answered YES to question #3 - What was the reason for participation after receiving your free carts?**

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**5. How many boxes in total did you normally place curbside for bi-weekly recycling collection BEFORE receiving recycling carts?**

1  2  3  4  5  6  more (please check correct answer)

**6. Which method of collection do you prefer?**

Recycle Boxes only  Recycling Carts only  Boxes & Carts

**7. If, given the opportunity, would you continue to use recycling carts, OR, go back to recycle boxes - Why?**

---

**8. If you were only given ONE cart for recycling collection which material would you use it for?**

- Paper Products       Bottles and Cans

**9. After receiving the carts did you recycle?**

- More       Less       Same as before

**10. What were the advantages of the carts?**

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**11. What were the disadvantages of the carts?**

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**12. Would you pay \$50.00 each for one or more carts?**

- Yes /  No

**13. Do you feel that you received sufficient information to assist you in participating in the cart pilot project?**

- Yes /  No

**14. If not, why?**

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**15. After receiving the recycling carts did you put them out for collection?**

- Less Frequently       More Frequently       Same As Before

**16. Which materials do you currently recycle? – Please list.**

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**17. Number of People in Household**

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**If you have any other comments – please use the space below to tell us!**

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### **Appendix C: Driver Survey/ Interview Questions**

What did you like about the carts?

What were your dislikes about the carts?

What problems if any did you encounter with the carts?

What specific mechanical problem did you encounter with the carts if any?

Is their anyway to easily correct or fix the problems that you encountered with the carts?

Would you like to see the carts replace recycling boxes?

If not, why?

Would you use the carts at your own home for recycling?

If not, why?

Did collection take longer with the carts compared to boxes?

If yes, why?

Would using carts benefit a recycling truck driver in any way?

If only one carts was allowed to be set out for collection per household compared to two carts what would be you overall opinion on that scenario?

What might be some of the problems encountered if residents were allowed to purchase carts if they wanted to from the EWSWA to use throughout the county for recycling?

How would having carts scattered miscellaneously throughout your route impact your daily collection?

What general observations did you notice if any with the carts? For example, residents, material collected, amount of material collected, contamination.



# JUST LIFT THE LID! Cart Recycling

Welcome to the Cart Recycling Pilot Project! Please use the PAPER cart to recycle all your paper products, and the CONTAINER cart to recycle all your containers. Check inside for a comprehensive guide of the materials you can recycle.

Thanks for your support and participation!

## PAPER RECYCLABLES



## CONTAINER RECYCLABLES



# CART RECYCLING PAPER

This guide will assist you in recycling all your paper products. All paper products should be placed in the paper recycling cart or, in the case of overflow, your red recycle box.

**Note:** The products listed in this flyer are only **EXAMPLES** of what can be recycled in our program. There are many other paper products that can be recycled as well. **Keep this tip in mind when it comes to paper recycling... 'if you can RIP it, you can RECYCLE it!'**

## Do NOT Place In Cart

- X** Please do **NOT** place plastic bags in the recycling carts / boxes. They are **NOT** accepted in our program.
- X** Laminated paper (paper covered in plastic) cannot be recycled.
- X** Potato chip bags are metallic - they cannot be recycled.
- X** No milk cartons/juice cartons. They cannot be recycled.

Place the materials listed below in your **PAPER** cart.

## Kitchen Paper

- Newspapers & Inserts
- Magazines
- Flyers
- Phone Books
- Junkmail
- Bills / Statements
- Cookie / Cereal Boxes
- Cracker Boxes
- Egg Cartons
- Frozen Food Boxes  
*(Lean Cuisine, Stouffers, etc.)*
- Tim Horton's Cups  
*(no lids)*
- Paper Towels
- Brown Paper Bags
- Sugar Bags
- Pet Food Bags
- Paper Towel Rolls
- French Fry Cartons  
*(just the carton - no fries)*
- Fast Food Paper Bags
- KFC Bucket

## Laundry Room Paper Products

- Dryer Sheet Boxes
- Detergent Boxes
- Swiffer Boxes  
*(i.e. dusting sheets, mopping sheets, etc.)*
- Magic Eraser Boxes
- Paper Packaging

## Home Office Paper

- Bills / Statements
- File Folders
- Gift Cards, Gift Boxes
- Envelopes
- Junkmail
- Paperback Books
- CD/DVD Boxes  
*(no jewel covers)*
- Notebooks
- Computer Paper
- Photo Paper
- Glossy Paper
- Construction Paper
- Wrapping Paper

## Bathroom Paper

- Toothpaste Boxes
- Razor Boxes
- Toiletry Boxes  
*(i.e. colognes, make up, etc.)*
- Feminine Hygiene Boxes  
*(i.e. Playtex, Always, Tampex etc.)*
- Toilet Paper Rolls
- Kleenex Boxes
- Soap Boxes

## Other Paper Products

- Paper Packaging  
*(i.e. from tools, car care products, etc.)*
- Paper Packaging  
*(i.e. from electronic devices, cell phones, radios, video games, etc.)*

## Cardboard

Cardboard should be flattened (where possible), bundled and placed **BESIDE** the paper cart. 30" x 30" x 8".

- Pizza Boxes
- Shipping Boxes
- Supply Boxes

## EASY TO DO!

If you are unsure of whether or not a paper product can be recycled - try to rip it. If you can - it should be RECYCLED.

Hardcover books can be recycled as well - just remove the outer cover - and recycle the inside.



Place all your paper **LOOSE** in the paper cart. Please remove all plastic inserts or wrappers from the newspaper.

If you fill up your paper recycling cart - use your red recycle box for the overflow.



# CART RECYCLING CONTAINERS

This guide will assist you in recycling your containers (cans and bottles)

All containers should be placed in the container recycling cart or, in the case of overflow, your blue recycle box.

Note: The products listed in this flyer are only **EXAMPLE** of what can be recycled in our program. There are many other containers that can be recycled.

Remember: When it comes to plastic bottles - Check the Neck!



If the plastic bottle has an opening **SMALLER** than the base - recycle it!

Place the materials listed below in your **CONTAINER cart**.

## Kitchen Containers

Place all the items listed below and to the right - **LOOSE** in the container cart. Rinse, & remove caps / lids. Ensure that the container is **EMPTY** of product.

### Metal / Aluminum Cans

- Pop / Soda
- Juice
- Soups
- Coffee
- Vegetable
- Pet Food
- Tuna / Crab



## Kitchen Containers

### Glass Jars

- Mayo Jars
- Salsa Jars
- Spreadable Cheese
- Relish
- Jam Jars



### Aerosol Cans

- Cool Whip
- Pam Cooking Spray
- Deodorizers
- Endust / Cleaners

## Bathroom Containers

### Plastic Bottles

- Shampoo
- Conditioner
- Body Lotion
- Face Lotion
- Body Wash
- Hand Soap
- Bubble Bath
- Pepto Bismol
- Cough Syrup



### Glass Jars

- Eye Cream
- Face Cream
- Face Scrubs



### Aerosol Cans

- Body Spray
- Shaving Cream
- Spray Deodorants
- Hair Sprays
- Hair Mousse
- Room Deodorizers

## Other Containers

- Windshield Washer
- Adhesive Bottles
- Spray Paint Bottles
- Car Wash Bottles
- Paint Cans

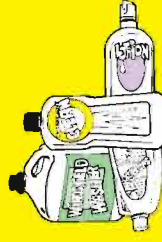
(i.e. no lids - must be **EMPTY**)

### EASY TO DO!

If you are unsure of whether or not a product can be recycled - ask yourself if it can be placed under one of the following categories. If it can - it should be **RECYCLED**.

- Plastic Bottles & Jugs (Aluminum or Metal)
- Glass Bottles & Jars
- Aerosol Cans
- Paint / Spray Cans

Container should be empty and lid removed.



**NO TUBS!**  
(Margarine, Yogurt, Ice Cream)  
They are not accepted in our program.

If you fill up your container recycling cart - use your blue recycle box for the overflow.



## Recycling is simple with carts. Just follow these 'easy to use' guidelines! If you have a question - call us 1-800-563-3377.

- ✓ Collect all items that are considered "recyclable". (see inside for a detailed list). Remember the list inside is only a guideline, there are simply too many recyclable products to list fully.
- ✓ Place the recyclables in the appropriate cart. (ie. paper in the PAPER cart, containers in the CONTAINER cart)
- ✓ Place the recycling carts out for collection on your regular recycling day. Your collection day stays the same.
- ✓ When it comes to paper - if you can rip it, you can recycle it.
- ✓ When it comes to plastic - recycle plastic bottles and jugs **ONLY** - **check the neck!**
- ✓ If you run out of room in your cart - please use a blue or red box for the overflow.
- ✗ Remember, **NO plastic bags in the recycling carts.** (Plastic bags contaminate the recyclables).
- ✗ **Tubs are NOT collected in our recycling program.** Tubs refer to: margarine tubs, ice cream tubs, plastic flower pots, yogurt cups, jello cups, etc.
- ✗ **Do NOT place full containers in carts.** Make sure all products are completely empty.
- ✗ **No broken glass or window glass in the recycling carts.**
- ✗ **No clamshell containers, or other styrofoam containers in the recycling carts.**
- ✗ **Don't use carts for garbage collection.** They will NOT be collected.

**Broken Cart:** If your recycling cart breaks, please call us at 1-800-563-3377 (leave your phone number). We will make arrangements to pick up the broken cart and have it replaced.

## Public Drop Off Depots

### Drop Off Depots in Windsor:

Take advantage of either Depot to dispose of excess Garbage, Yard Waste, Household Chemical Waste and Recyclables. Residents can drop off recyclables, cardboard, metal items (including appliances), yard waste (including leaves, tree trimmings & grass clippings), household chemical waste, tires and garbage.

All recyclables, and household chemical waste can be dropped off **FREE OF CHARGE.**



**3560 North Service Rd. East**

### Open All Year:

Monday - Saturday  
**March thru November**  
8:00 a.m. to 4:45 p.m.

### Dec., Jan., & Feb.

8:30 a.m. to 4:00 p.m.  
Sat.: 9:00 a.m. to 12:45 p.m.



Essex-Windsor Solid Waste Authority / 1-800-563-3377 / [www.ewswa.org](http://www.ewswa.org)

## Appendix E - Public Notice to Tecumseh Residents

### Office of the Mayor

917 Lesperance Road  
Tecumseh, Ontario  
N8N 1W9

Phone (519) 735-2184  
Fax (519) 735-8326

www.tecumseh.ca

# The Corporation of the



# Town of Tecumseh



MAYOR - MAIRE  
GARY MCNAMARA

## PUBLIC NOTICE TO SELECTED TECUMSEH RESIDENTS

May 18, 2007

Dear Resident:

### Re: Recycling Cart Pilot Project in Tecumseh

You have been **selected to participate in a recycling pilot project** taking place this spring and summer in selected areas of the Town of Tecumseh. The pilot project is being conducted by the Essex-Windsor Solid Waste Authority (EWSWA). The Authority is responsible for the regional solid waste management system including recycling collection.

**YOU WILL RECEIVE:** Two blue recycling carts on Saturday, June 2<sup>nd</sup>.

#### **Background:**

As the recycling program expands, we are finding many homeowners are placing several recycle boxes out for collection. Extra boxes add time to recycling routes, take up quite a bit of space in garages, houses, or sheds, and leave little room for program expansion (i.e. the addition of more materials to recycling collection). Recycle boxes do not have a viable option for lids either, and the wind causes many problems with recycling collection. The Authority is looking into a potentially more effective and efficient alternative - recycling carts.

In order to obtain baseline data on whether or not recycling carts provide a cost effective and efficient alternative to recycle boxes, we have to 'pilot' (test) out the concept first. Your house is located in one of our targeted areas for the pilot project.

#### **Specifics:**

- **On Saturday, June 2<sup>nd</sup> you will receive two (2) recycling carts.** The carts have a lid, handle and are equipped with wheels. *(see next page for a picture)*. **These recycling carts are free of charge and are yours to use until the conclusion of the pilot project, at which time the Authority will determine whether cart recycling collection will continue or be terminated.** The carts are 35gal/132L – which is the equivalent of 2.5 recycle boxes.

- **One cart will be designated for paper, and one cart will be designated for containers.** *(the same as the current recycling program)*
- **Your recycling collection day does not change.** Simply place your new recycling carts out at the **curb** every other week, on your specified recycling collection day.
- If you fill your recycling carts with recyclables and need additional space, **please use your red and blue boxes for overflow.**
- **You can begin to use your recycling carts as soon as you receive them. The pilot project will take place over the summer months – concluding at the end of August.** During this time, Authority staff will be conducting research. The objective of these studies is to determine whether or not residential recycling carts are an effective and efficient alternative to recycle boxes for homeowners.
- **Houses have already been selected for this pilot project.** Family members, friends and neighbours cannot call in and volunteer - although we appreciate the interest and support.

### **Public Open Houses:**

In order to answer any questions about the pilot project and your participation, the Authority has scheduled two (2) open houses for your convenience. EWSWA staff will be on hand to answer any questions you may have, to distribute literature, and to show you what the recycling carts look like.

**The Pilot Project Open Houses will take place at the Tecumseh Arena - (12021 McNorton) in the Town of Tecumseh.**

**Day Session - Wednesday, May 30th:**  
1 p.m. - 3 p.m.

**Night Session - Thursday May 31st:**  
7 p.m. - 9 p.m.



We appreciate your time, consideration and participation in this pilot project. Without your assistance we would not be able to expand our operations, research alternatives, and provide residents with the best possible recycling services.

As Mayor of the Town of Tecumseh, I encourage your participation in the pilot project.

If you have any questions about the pilot project, please contact the Essex-Windsor Solid Waste Authority at 1-800-563-3377, or email at [info@ewswa.org](mailto:info@ewswa.org)

Yours truly,

A handwritten signature in black ink, appearing to read 'Gary McNamara', with a long horizontal flourish extending to the right.

Gary McNamara  
Mayor  
Town of Tecumseh

GM/lp