

CIF #340

Essex- Windsor Solid Waste Authority Public Space Recycling: Phase 2



Final Report, March 1 2015

EWSWA – Public Space Recycling

CIF Project number 340

Phase 2

CIF #340 – Public space recycling implementation – Phase 2

Acknowledgement:

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EXECUTIVE SUMMARY

The Essex Windsor Solid Waste Authority (The Authority) implemented a public space recycling program in three of the City of Windsor's parks during the summers of 2011/12, with financial and technical support offered through Continuous Improvement Fund (CIF) project #340. The Authority completed a summary report which detailed the impacts of this programming on waste diversion in the community. This report included an analysis of the waste materials captured through the garbage and recycling containers in the park areas in addition to operating cost estimates. Key findings of the report identified high levels of contamination (28%) and low capture of materials (68%) of recyclables. Staff recommended that the program could be improved by:

1. Completing the twinning of garbage bins with recycling, and
2. Improved promotion & education (P&E) of the program

During the summer of 2014, the Authority completed the twinning process in the parks and a P&E campaign, which included improved signage, labelling on bins, and newsletters to local residents. The Authority also completed an extensive measuring and monitoring plan to evaluate the success of their twinning and P&E efforts. The following report documents these efforts and their impacts on the public space recycling program.

The results reinforced feedback from parks staff, contamination was reduced to an acceptable level (12%) and the capture of targeted material increased (75%). Operationally, the Authority identified that the containers used in this program require even less service throughout the year, thanks to the large storage capacity of the bins, than initially thought. The current system only requires that bins be serviced, on average, once annually. Staff have the following recommendations for municipalities looking to implement similar programming in their communities:

- Bigger is Better: The large storage capacity of the bins reduce operational costs by requiring fewer services annually to adequately service park areas
- Waste Auditing requires critical thought and planning: Even when hiring a consultant, it is imperative that staff have a complete understanding of the procedures of the audit and, especially, what the reported data means and how it is calculated
- P&E helps: Signage, labelling, and outreach impacts capture and contamination
- Twinning is essential: Twinning matches the service level of waste management programs, reinforces at home recycling behaviors, and reduces costs associated with landfilling, but Staff recommend completing an analysis to identify the capacity you need

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IMPLEMENTATION

Task 1 – Twinning the remaining bins

A total of 15 additional Alpha maxi30 recycling bins were installed and twinned with garbage Alpha's to fill in gaps in the study area. Five extra were purchased as Alpha was having a sale. These areas were thought to be missed opportunities for the capture of recyclables and possibly the reason for some of the lower capture rates from the original waste audit data in 2013. The 15 new recycling receptacles were installed in the summer of 2014. Therefore, a total of 100 Alpha recycling receptacles have been installed in total as a result of the Authority's public space program and CIF project #340.

Task 2 – Promotion & Education (Communication Materials)

The communication materials utilized for the 2014 season were:

1. New recycling and garbage sticker labels
2. Large metal signs at park entrances and key areas
3. Painting of large Mobius Loops on the front and back of every Alpha recycling receptacle.

The new recycling stickers included new materials such as tubs and lids, clamshells and metal trays. In addition a no paper graphic showing no newspaper and coffee cups (common contaminants identified in the previous years' was audits) was added to help discourage paper from being placed into the container's only recycling program in the parks. The title of the sticker was also changed from "We Can Recycle More" to "CONTAINERS ONLY!" All of the changes were made as a result of findings from 2012 waste audit data. New garbage stickers were also installed on the waste receptacles as many of stickers were faded and some waste receptacles had no communication material at all to help the public distinguish between the two receptacles.

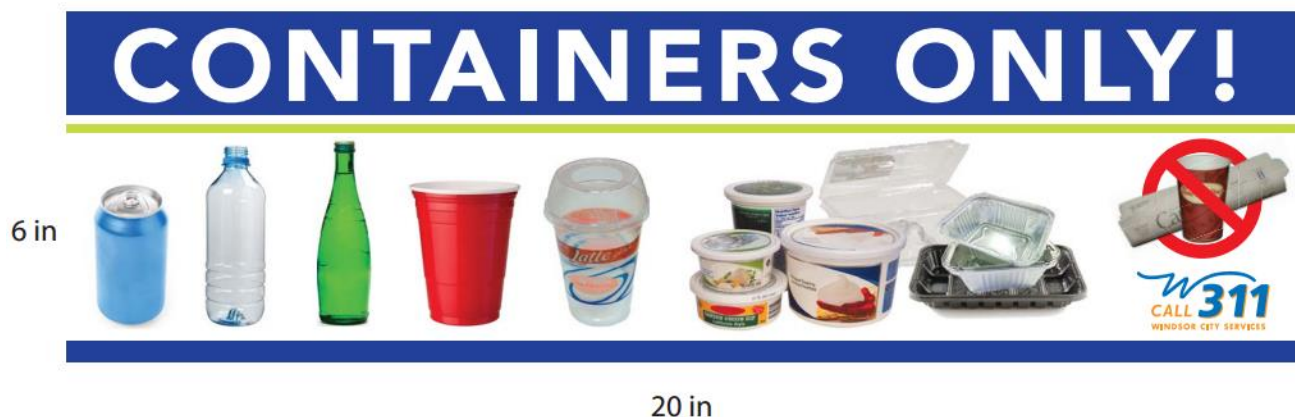


Figure 1: New sticker label for recycling bins.

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In an attempt to make the recycling bins even more distinguishable to the public, The City of Windsor Signs Department was hired to create a large stencil of a Mobius loop. The stencil was used to spray paint a Mobius loop on the front of the Alpha recycling silo and on the inclined back of the lid of all 100 Alpha recycling containers in the study area (figure 2). This was the runner up option to the original scope of placing Lexan Wraps with messaging on the Alphas. EWSWA and the City of Windsor did not want to miss out on the opportunity for P&E on the largest part of the recycling receptacles.

All staff and parties involved were very pleased with the outcome of the painted on Mobius Loops. The rationale for the painting was that the cost of a large sticker was tremendously high and would have needed to be replaced due to fading or damage in 2-3 years. The painting was much more cost efficient, less labour intensive and would be permanent. As a result all new Alpha recycling receptacles will be spray painted with the Mobius loop before they are installed at the main yard where they are kept to reduce the cost of having staff go around to each location after installation. A large portion of the cost of painting the stencil on park bins was City of Windsor staff driving around to all locations to paint.



Figure 2: Painted Mobius loop

To help increase recycling education within the parks 10 new 3ft x 4ft aluminum signs were installed in high traffic areas throughout the three parks (Mic Mac Park 4, Riverfront 4, and Ganachio Park 2). The signs were labelled “We Can Recycle More in our Parks”. The signs showed pictures of the recycling and garbage Alpha’s and pictures of materials that are wanted in each container. The signs also displayed the same no paper graphic as displayed on the stickers with the addition of text beside it asking the public to “Please take paper home for recycling”. This was believed to be necessary to address the large amounts of paper in the recycling stream from the 2013 waste audits.



Figure 3: New signage in parks

PROGRAM COST

Table 1: Public space program updates budget breakdown

Item	Description	Cost
Alpha Recycling Containers	New containers to complete twinning of garbage receptacles	\$11,180
Signage	Overhead metal signs (10) at key points in parks	\$ 1,300
Sticker labels	Sticker labels of acceptable materials on all recycling and garbage receptacles (100 x 2)	\$ 5,029
Flyers, guidebooks	P&E communication materials delivered	\$ 4,086
Monitoring and Measuring	Activities monitoring materials captured through waste streams	\$ 9,584
Total		\$ 31,179

MONITORING AND ASSESSMENT

Waste Audit Sampling Process

The waste audit sampling process was the same as presented in phase 1 of this project, with the exception of EWSWA Waste Diversion Specialist and EWSWA summer students were responsible for auditing. EWSWA Waste Diversion Specialist shadowed City of Windsor staff when emptying the Alpha’s in preparation for the two week samples and the collection of all samples to ensure accuracy. The City of Windsor waste material was collected a total of two times for auditing throughout the summer of 2014. The waste collection dates and associated materials can be viewed in Table 2. Both audits included the sampling of the same 24 Alpha containers from the baseline and 2013 audits for consistency and represented two weeks representation of waste and recycling. Fullness studies were conducted every Wednesday for 18 weeks from May 7, 2014-August 18, 2014. A total of 60 garbage and recycling alpha maxis were studied. All 100 were not studied due to staff and time restraints. The alphas were opened and given either a >.25, .25, .50, .75 or full description Appendix.

Table 2: Waste audits completed

Audit	Collection Date	Waste Material Audited
Follow-up Audit 4	July 11, 2014	Garbage and Recycling
Follow-up Audit 5	August 28, 2014	Garbage and Recycling

Waste Sorting Process

The waste sorting process remained identical to phase 1 of this project, for consistency purposes. The only exception is that paper cups in the recycling stream audits were sorted with gable tops as they are now being baled at the EWSWA MRF with gable tops. A full breakdown of the change in scope waste audits is presented for garbage waste (table) and recycling waste stream (table)

ANALYSIS OF PUBLIC SPACE RECYCLING OPERATIONS

Analysis of Waste Audit Information

Table 3: Annual Materials Generated, Captured, and Contamination for City of Windsor Public Spaces Waste Management in City Parks. 2014 Waste Audit Data completed by Authority staff

City of Windsor Park	No. of Bins	Annual Tonnes Generated per Bin		Total Annual Tonnes Generated		Recyclables	
		Garbage	Recycling	Garbage	Recycling	Capture (%)	Contamination (%)
Mic Mac Park	18	0.069	0.027	1.24	.48	86.66	14.5
River Front Park	59	0.167	0.031	9.85	1.82	61.26	9.5
Ganatachio Park	23	0.117	0.016	2.69	.36	78.57	12.5
Total:	100	.353	0.074	13.78	2.66	75.49	12.16

As a result of fullness data 20 full recycling receptacles were emptied from May 2014-September 2014. 64 garbage Alphas required emptying from May 2014-September 2014. Average weight of one full recycling silo is 100kgs according to EWSWA data and scale weights.

The implementation of twinning garbage with recycling bins has resulted in the capture of an additional 2.66 metric tonnes of recyclables per year for the City of Windsor in just the three parks studied. As a result of added P&E the capture rate increased from 67.66% in 2012 to 75.49% in 2014 and the contamination decreased significantly from 28.01% in 2012 to 12.16% in 2014. Total amount of garbage collected in the three City parks has decreased since implementation. Total annual tonnes of garbage in the three parks have decreased from 17.36 tonnes in 2012 to 13.78 tonnes in 2014 a difference of 3.58 tonnes.

The total annual tonnes of estimated recycling collected decreased from estimations of 6.14 tonnes 2012 to 2.66 tonnes in 2014. As the recycling contamination was high (28.01%), in 2012, the actual annual recyclables collected is estimated at 4.43 tonnes. It is estimated that an additional 1.6 tonnes has been captured in the parks in 2014, but remains in the alphas that have not been collected because they are not full. Therefore, annual recyclable material captured is estimated to be 3.6 tonnes.

Analysis of Operations

The following represents the new financial breakdown of the cost, revenue, and cost avoidance implications of the City’s public space recycling program as a result of 2014 data.

The original operating cost from data in 2012 was based on recycling bins in City parks being serviced 4 times a year. Four months of fullness data, representing 60 recycling and garbage Alphas, in 2014 revealed that 2/3 of the recycling receptacles didn’t require any servicing during the year. Therefore, only approximately 20 of 60 recycling receptacles required servicing. Previously it was determined that the cost to service the city’s public space recycling program was \$10,900 annually; and the cost to service each container 4 times to be \$121.21 annually. The new data indicates the cost to be much less. It is

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estimated that the collection cost per container to service is \$30.53. With only 1/3 of the containers requiring service the new annual collection cost of servicing the public spaces recycling program is \$610.60. This due to the fact that many of the recycling receptacles at the end of the summer were >.25 -.25 % full. Therefore, many recycling containers not requiring servicing for 3-4 years potentially. A full breakdown of cost to service the public spaces recycling program can be found in Table4

EWSWA Waste Diversion Specialist and City of Windsor staff tracked the servicing and tonnes collected for the 2014 summer May1-September1, 2014. The City of Windsor public spaces program collected 2.00 tonnes of very clean recycling from the 3 parks. Each Alpha recycling receptacle when full weights approximately 100kg. The City profits from the sale of the materials and it is estimated that the three parks recyclables generated \$1615.60. This is assuming that 67% of the recycling stream was PET beverage bottles at \$446 a MT and 33% was Aluminum at \$1,526 a MT.

The City of Windsor regularly pays to tip waste from the garbage stream collected in the City' parks at the EWSWA Regional Landfill. The cost for a garbage silo to be serviced is \$32.44 this cost does not include what the EWSWA charges the City of Windsor per tonne for waste received from the parks. The EWSWA does not charge for recycling. The City of Windsor was charged \$3,918.57 in 2013 for tipping fees for public spaces waste. The City of Windsor to date for 2014 has been charges \$2 924.83 in tipping fees for public spaces waste. EWSWA municipal rate tipping fee for 2014 is \$32.44 MT.

The City has realized a cost savings of approximately \$648.80 (20 less services) as a result of public spaces recycling. Therefore, the public spaces recycling program saved the city \$94.96 and created new revenue of \$1615.60 is the sale of recycling material collected. A full cost breakdown of the new revenue generated through the public space recycling program and cost savings as a result of fullness data from 2014 can be found in Appendix.

Table 4: 2014 Operational Analysis Cost and Activity Breakdown

Item	Subtotal	Total
Annual operating costs 2014		
Staff @ \$26.85/hr for 6.4 hours from May 1- September 30, 2014	\$171.84	
1 bag @ \$7.50	\$150.00	
1 Packing refuse truck @ \$42.25/hr for 6.4 hours	\$270.40	
Total annual operating costs		\$592.24
Revenue generated from sale of recyclable materials for period		
1.33MT of PET containers @ \$446.00	\$593.18	
0.67 MT of Aluminum containers @ \$1,526.00	\$1,022.42	
Total revenue generated		\$1,615.60
Cost avoidance		
Less: 20 fewer services of garbage silos @ \$30.53/tip	\$610.60	
Less: 3.6 tonnes of garbage @ \$32.44 a tonne	\$116.78	
Total costs avoided with diversion from recycling		\$727.38
Annual costs for operation of City's public space recycling program		-\$1,480.46

CONCLUSIONS – LESSONS LEARNED

Waste Audits

As the Waste Diversion Specialist (WDS) and the person responsible for organizing and manually conducting waste audits, analyzing the data, creating reports and having a stake in the results because they are my programs that I am invested in. I feel as though I have a unique outlook at waste auditing being used as the end all be all for how successful a recycling program is. Most municipalities hire a consulting company to conduct waste audits and the consultants follow waste audit criteria and standard methods. A report is generated based on the waste audit data and for the most part supervisors, managers, boards and council review the report and take those numbers as is.

As the WDS who is involved during the entire process and after conducting many waste audits I truly believe that too much weight and decision making is placed on typical waste audit results. Over the past 11 years of conducting waste audits and analyzing data I find myself discouraged by what the data says versus what I observe – Especially, with the waste and recycling stream becoming so light due to all the plastic products. A single heavy weight item can throw off the results, especially if a sample is small. Throughout the public spaces waste audits I observed practically very little to no contamination in the recycling stream. Paper and glass bottles are common problem materials in this regards. If there is an abundance of paper, which is heavy because it is usually wet as a result of water and liquid from pop and beverage containers, in the recycling stream or a couple glass bottles in the garbage it really takes a toll on our capture and contamination rates.

What I observe at the sort table was really a waste stream with only 4-5 pieces of recycling in it and a recycling stream with hardly any contamination. However, the capture rates previously observed were, in my opinion, not an accurate reflection of what was really happening in our public spaces program. As a result of this discrepancy, an “individual units” recycling audit was conducted on a full Alpha Maxi. The results were, in my professional opinion, a more accurate reflection of what I was observing. Upon receiving a full silo/alpha maxi of recycling from one of our study areas, an audit was performed where the individual units of recycling were counted and the amount of garbage pieces were also counted. The total weight of the silo/alpha maxi of recycling was 102kgs. There was 296 pieces of garbage (contamination-straws, plastic bags, Styrofoam, coffee cups). There were 2,583 pieces of recycling (gable tops, tin cans, aluminum cans, plastic bottles, mixed plastics). Therefore the total amount of pieces in a 102 kg bag of recycling is 2,879.

- | | |
|---|-------|
| - Percentage of recycling (in pieces) | 89.7% |
| - Percentage of garbage/contamination (in pieces) | 11.0% |

Until the province is able to standardize how waste audits are conducted by in house staff and consultants across the province and incorporate a methodology for auditing using volume or pieces and ways to address items that become wet and hold moisture like paper I believe that the standard waste audit is only representing a small piece of the picture/snap shot of how successful recycling programs are.

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Containers

If a municipality is considering using alpha maxi, take the time to decide what locations would benefit from this style of container. Some containers were placed in areas that, based on our fullness data, will take years to fill up; this could be positive or negative. In some areas such as Ganachio trail perhaps too many were placed in close proximity. The same would go for deciding where an alpha maxi for waste will be placed. For this study all of the alpha waste receptacles were twinned. I would recommend municipalities have a strategic plan for the most heavily utilized parks and high traffic areas be the priority for installation of alpha waste and recycling receptacles.

Be aware when installing containers that weed-whippers or lawn mowers need to be able to get in between. Many of the alpha recycling alphas were placed too close to each other. Therefore, maintenance equipment could not cut grass between them. It also made it difficult when conducting fullness audits and for the staff required to service the alphas because the lids touched making them difficult to remove.

Next Steps

The City of Windsor Environmental Coordinator has received budget approval to continue to twin the remaining alpha waste receptacles with alpha recycling receptacles in all City parks and to make it best practice if any new alpha waste receptacles are installed in parks that at the same time it will be twinned with an alpha recycling receptacle. This will cut cost and save time instead of having to go back at another time to install the second receptacle and have another locate for wires etc. conducted.

A presentation will be given to all parks supervisors and managers on the results of project #340. As a result of project #340 the recycling is closely monitored to ensure that it makes it to the EWSWA MRF and tonnage is now being tracked so that public spaces recycling can be tracked separately for proper monitoring and measuring.

As a result of the public space recycling program, Staff estimate that 48 fewer tonnes of material have entered landfill .