CIF PROJECT #955

BLUE BOX DEPOT COLLECTION
ROLL OFF TO FRONT END BIN SERVICE IMPLEMENTATION

Municipality of Hastings Highlands

Final Report
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Prepared for:
Resource Productivity and Recovery Authority
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Executive Summary

Hastings Highlands provides its recycling program through 9 rural depots. The municipality provides trained staff at the depots and the transportation and processing services are contracted out via a transport contract. CIF project #955 is intended to improve the financial and operational efficiency of Hastings Highlands recycling depots. To accomplish this, the Municipality replaced its inventory of un-compacted 2 compartment roll off containers with an 8 yd^3 front-end bin system. In general, any municipality with un-compacted roll off collection equipment should consider the findings of this report that shows the positive impact of implementing a front-end bin compaction system to transport recyclables.

From an operational perspective, the transition from top loading roll off containers to ground level recycling containers was for the most part well received by attendants and residents. From the resident's perspective, it was noted that it was easier to recycle because:

- use of walking ramps was eliminated,
- access to the new front-end bins is done by driving up and loading material directly from the vehicle during all seasons, and
- residents could see recyclables in each bin reinforcing the need to properly sort.

From the attendants' perspective, it was noted that:

- it was easier to monitor recyclable material quality as there is good visibility into the bins,
- when an 'error' was made, it is easily corrected as the material is accessible as opposed to a roll off where the material was never reachable,
- health & safety of residents and staff was better protected as there is no need for ramp access, and
- the MRF noted no issues with contamination.

The transition from the roll off system over to front end bin system took place at the end of 2016 and was fully in place January 2017. For the purposes of this report, 2016 annual data is compared to 2017 annual data. Bin capital costs were $60,030 to purchase 60 front end bins for the Township's nine depot collection sites. Total project costs to implement the new front end bin system amounted to $79,182, including site preparation and promotional & educational information.

The use of front end bins resulted in reduced truck loads from 381 roll offs to over 50% less recycling milk runs, or 166 trips; although material decreased over 10%. Given that the recycling system is dove tailed with the garbage run, the front-end truck is fully utilized in both directions. As a result of this program change, the municipality has realized a savings of more than $60,000 in the first year of operations (one third of program costs). This return on investment is estimated to have a payback period of 1.33 years. The cost efficiency of the new program improved from $540 per tonne to $427 per tonne.

The municipality is satisfied the front end bin system has been a resounding success in helping provide a safe, easy and financially sustainable improvement to the recycling program.

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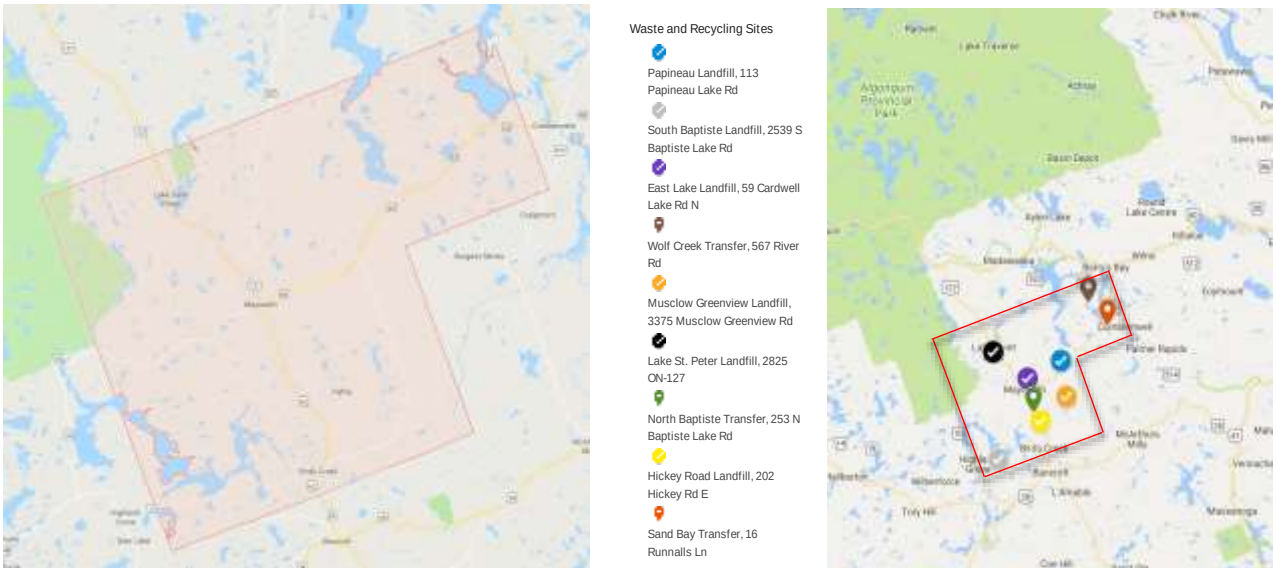
Background

The Municipality of Hastings Highlands was incorporated on January 1, 2001 with the administrative and commercial centre being the community of Maynooth, located at the junction of Highway 62 and Highway 127 north of Bancroft. The township also comprises the communities of Baptiste, Bell Rapids, Birds Creek, Centreview, Graphite, Greenview, Hickey Settlement, Hughes, Hybla, Lake St. Peter, Maple Leaf, Maynooth Station, McAlpine Corners, McGarry Flats, Monteagle Valley, Musclow, Purdy, Scotch Bush, Scott Settlement and York River.

Municipality of Hastings Highlands



Source Google Maps, 2018, Map Generator

The Municipality delivers the waste management service through the staffing of 9 recycling depots all of which were are located at existing and closed landfills. The number of landfills has decreased to six; as each site reaches capacity it is capped and closed but the site remains as a transfer station for both recycling and waste. Based on the 2016 Census, the township has a population of 4,078.

CIF Application

CIF Project #955 was to improve the financial and operational efficiency of Hastings Highlands recycling depots. To do this, a decision was made to replace the Municipality's un-compacted 2 compartment roll off containers with an 8 yard front-end bin system. This project will also target system optimization as other neighboring municipalities move to similar front-end bin systems.

In the summer of 2016, the CIF entered into an agreement with the Township to provide financial support to purchase front end bins and project support and reporting as per CIF grant requirements. The CIF funded Project 955 as follows:

- Funding percentage of blue box related project cost: 40%
- Maximum funding limit: $28,647 (includes 1.76% non-recoverable taxes)

Project Goals

The project goals were:
- Standardize depot services and provide easier access to recycling at depots,
- Reduce the number of loads shipped from depots to MRF, and
- Reduce operating costs

Township Waste Management System Pre-Implementation

The Township provides recyclable material collection depot services at all of their sites. Each site used 40 yd^3 roll-off bins with 70/30 or 60/40 split (containers/fibre). Each roll-off cost $400 per load to transport and process with services provided by a local roll off hauling firm, Reid Transportation. In 2016, 381 roll-off loads were transported which is equivalent to 15,256 cubic yards of material at a total contractor cost of $152,000. With the additional operating costs, such as labour, monitoring etc., the annual operating cost of the recycling program was $192,000.

Photo: a typical top load 40 yd^3 recycling bin and access ramp

As is the case using non-compacted roll-offs, a bin must be transported whenever either compartment is full. In general, the container section usually becomes full first. And regardless of whichever is full, given the bin is not compacted; relatively speaking it is mostly air that is being transported.

Front End Bin Implementation

In order to establish the front load system, each location was landscaped to enable bin placement, ease of resident access and annual yard maintenance. To purchase the bins, a request for quotation for 60 bins was issued to the transport contractor Beaumen Waste Management and each container was $988.00 plus $90 delivery and applicable taxes; a total cost of $64,680.

Based on the number of roll of containers and weights of recyclables, the 60 containers were distributed to the nine locations as follows:

Bin Distribution and Locations

Wolf Creek	6
Sand Bay	6
Papineau	8
Musclow-Greenview	6
East Lake-	6
Lake St. Peter	6
North Baptiste	7
Hickey	5
South Baptiste	10
Total	**60**

Site modifications and promotional & educational materials helped facilitate the transition to the new front end bin system. The costs of these items amounted to $14,500 in total.

Project Budget

Bin purchases	$64,680
Site modifications	$12,256
Promotional & Educational information	$2,246
Total	**$79,182**

Project Period and Observations

For the purposes of this report, the collection time frames reported are Jan – Dec 2016 for roll off and Jan - Dec 2017 for the front-end system.

From an operational perspective, the transition from roll off containers to ground level recycling containers was for the most part well received by attendants and residents. From the resident's perspective, it was noted that it was easier to recycle as there was:

- no need to carry items up a ramp,
- easy access to drive up and deposit material directly from vehicle during all seasons, and
- good visibility into the bins which reinforced the need to recycle right.

From the attendants' perspective, it was noted that:

- monitoring of bins and materials seems easier due to good visibility into the bins,
- if a resident placed material in 'error', it is easier to correct as the material is generally accessible as opposed to a roll off where the material was never reachable,
- health & safety of residents and staff is protected as there is no need for ramp access, and
- there were no rejected loads at the MRF due to contamination.

However, not all aspects of the change were without a downside. Staff note that yard maintenance, in the winter specifically needed a bit of extra time to keep the front of bins clear. As well, while the bins are readily accessible, a few senior residents have mentioned to the attendants that the bins are too tall to easily deposit their recyclables.

Bin Pick Up Timing

Pick up times for the recyclables has improved greatly. For a roll off system, each site would have to have a dedicated run of delivering an empty bin and switching it for a full bin. The travel times varied by site and were as little as an hour and a half up to three and half hour round trip. The amount of time taken for a site switch is usually higher in winter due to road conditions.

Hastings Highlands, in designing and establishing a contract with Beaumen, opted to have waste picked up from some sites and taken to a landfill for disposal and then to have the same truck conduct a collection route for a recycling run. Each site is able to manage both recycling and waste in dedicated front end bins. To that end, Beaumen makes a run out to the sites in a series of stops to collect waste, then disposes in one of the active landfills. Once completed the recycling collection commences in a reverse run with fibre collected one week and commingled materials the following week. To travel to all sites and return to the MRF is 234 km from the furthest depot, approximately four hours to drive and cycle through the bins. Each bin cycle time is about 20 seconds.

Photo: New 8 yd^3 bins at East Lake depot

Promotion and Education

As part of the project, the municipality provided residents with advance information on the program change and prepared new bin signage. Promotional materials were distributed by site staff to residents at the depot drop off sites prior to implementation of the new program. Signage was prepared and installed on bins in January of 2017.

Roll Off to Front End Bin Comparisons

The total yards and tonnage collected decreased from 2016 to 2017. The one year tonnage difference is possibly caused by several factors:

- old contractor did not have proper methodology to track tonnage and recycling end markets,
- new contractor has bin tracking system, proper weigh scale and MRF to manage the recyclables, and
- light-weighting of packaging and generally less fibre. While both streams dropped 24 tonnes each; the fibre stream had less newspaper. This trend is also seen in other municipal programs such as Bonnechere Valley and Madawaska Valley, both neighbouring communities.

Tonnage Comparison

	2016 Tonnes	2017 Tonnes	2016 to 2017 % diff.
Fibre	200	176	-12%
Containers	156	132	-15%
Totals	356	308	-13%

Cubic Yard Comparison

	2016: 40 yd Roll Offs	2017: 8 yd bins	2016 to 2017
Fibre	212	940	
Containers	169	776	
Totals	381	1716	
Yards	15256	13728	-10%

Of note is the positive reduction in front end bin runs. While it took 381 roll off trips in 2016, the number of front end bin runs in 2017 was only 166, with a low of 12 runs in February and 19 runs in August.

Financial Analysis

With the implementation of new front end bins, the recycling program costs have been reduced even with the fewer tonnes collected.

The ongoing savings that this project has realized is $60,470 per year. The total costs to transition to the front end load system amounted to $79,182, resulting in a payback period of 1.33 years. The cost effectiveness of the program also improved from $540 per tonne to $427 per tonne

Annual Comparison		
	2016	**2017**
Program Cost	$191,944.53	$131,474
Tonnes	356	308
$/tonne	$539.17	$426.86
$ Savings		$60,470.14
% Savings		32%

A 21% improvement in the per tonne efficiency measure moves Hastings Highlands closer to the top in comparison versus other group 7 datacall reporting municipalities.

Conclusions

In conclusion, from both a financial and operational view, the CIF Project 955 can be viewed as a success and the Township and the Blue Box Stewards will see an increase in program efficiency and reduced operational costs. In general, any municipality with a top load roll off collection equipment at their depot site(s) should consider a change to the Front-End Bin System for its recycling program.

Operationally, the system works very effectively for both residents and municipal staff. The front-end bin system allows for easy vehicle access and resident use. And staff are able to monitor and manage contamination more effectively. The use of front end bins also results in reduced contractor costs as well as the number of truck loads from 381 roll offs to over 50% less recycling milk runs, or 166 trips. Given that the recycling system is dove tailed with the garbage run, the front-end truck is fully utilized in both directions.

Appendix A: Site Bins

Wolf Creek

Sand Bay

Musclow Greenview

Lake St. Peter

East Lake

North Baptiste

Hickey

South Baptiste