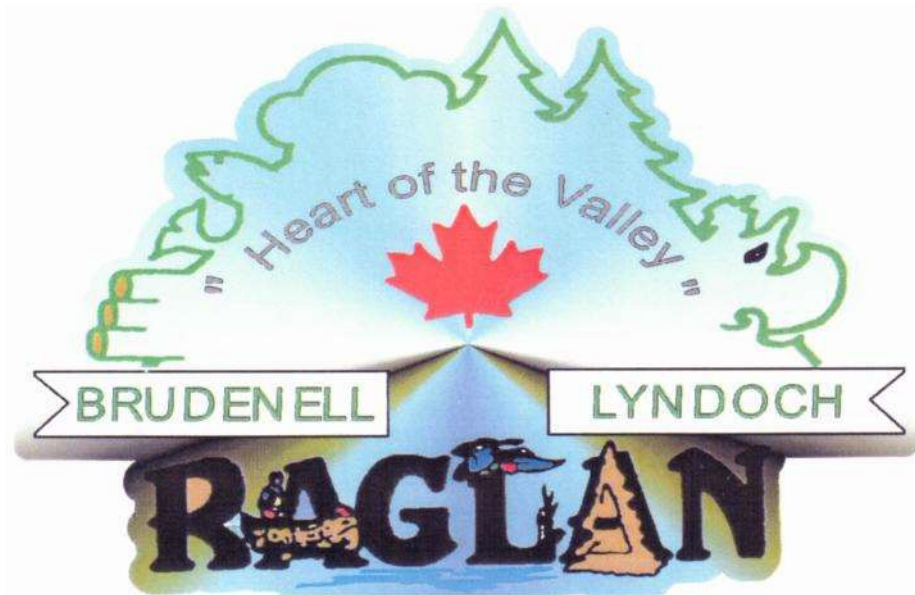


Waste Diversion Ontario Continuous Improvement Fund



CIF PROJECT #964

BLUE BOX DEPOT COLLECTION – DEPOT TO FRONT END BIN SERVICE IMPLEMENTATION

Final Report
May 2019

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Acknowledgement

This Project has been delivered with the assistance of Waste Diversion Ontario's Continuous Improvement Fund, a fund financed by Ontario municipalities and stewards of blue box waste in Ontario. Notwithstanding this support, the views expressed are the views of the author(s), and Waste Diversion Ontario and Stewardship Ontario accept no responsibility for these views.

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Executive Summary

Project 964 application was to improve the financial and operational efficiency of Brudenell, Lyndoch and Raglan's recycling depots. To do this, a decision was made to replace the Municipality's un-compacted 2 compartment roll off containers with a front-end bin system. The pick-up of the roll-off containers was already carried out by a private contractor and the service of the front-end bins was assigned to the same private contractor. 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 as there was:

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

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 and safety of residents and staff was better protected as there is no need for any ramp access. The ramps were a general trip or slip hazard and increased in the winter due to snow and ice, and
- the MRF noted very little contamination.

The transition from the roll off system over to front end bin system took place at the end of 2018 and was fully in place January 2019. For the purposes of this report, 6 months of data is used from November 2018 to April 2019 as the project was delayed due to municipal budget deliberation issues and a delay of the bin fabrication at the manufacturer.

Introduction

The Municipality of Brudenell, Lyndoch and Raglan retained Redi Recycling Inc. to assist with a review of its recycling depot operations. The scope of the review took into account the operating parameters of using un-compacted 40 yd³ recycling containers compared to utilizing front end bins. This review was intended to determine if there would be an operational improvement and financial savings.

Background

The Municipality of Brudenell, Lyndoch and Raglan was incorporated on January 1, 1999 with the merger of Brudenell, Lyndoch and Raglan.

Municipality of BLR



Source Google Maps, 2018

Municipal staff delivers the waste management service through the staffing of three recycling depots all of which were at one time functioning landfills.

Canada census – Brudenell, Lyndoch and Raglan community profile

	2016	2011	2006
Population:	1503 (-9.3% from 2011)	1658 (10.8% from 2006)	1497 (-4.3% from 2001)
Land area:	706.24 km ² (272.68 sq mi)	705.83 km ² (272.52 sq mi)	702.77 km ² (271.34 sq mi)
Population density:	2.1/km ² (5.4/sq mi)	2.3/km ² (6.0/sq mi)	2.1/km ² (5.4/sq mi)
Median age:	53.5 (M: 54.0, F: 52.8)		46.2 (M: 46.7, F: 45.8)
Total private dwellings:	963	1031	1065
Median household income:			\$35,637

References: 2016^[2] 2011^[3] 2006^[4] earlier^[5]

Project 964 application was to improve the financial and operational efficiency of Brudenell, Lyndoch and Raglan’s recycling depots. To do this, a decision was made to replace the Municipality’s un-compacted 2 compartment roll off containers with a front-end bin system. The pick-up of the roll-off containers was already carried out by a private contractor and the service of the front-end bins was assigned to the same private contractor.

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 964 as follows:

- Funding percentage of blue box related project cost: 34%
- Maximum funding limit: \$16,974 (includes 1.76% non-recoverable taxes)

Project Goals

The project goals are:

- Standardize depot services and provide easier access to recycling at depots
- Reduce the number of loads shipped from depots to MRF
- Reduce operating costs

Township Waste Management System Pre-Implementation

The Township provided recyclable material collection services at all 3 depots, all sites used 40 yd³ roll-off bins with 70/30 or 60/40 split (containers/fibre). Each roll-off cost \$300 per load to transport and process with services provided by Beaumen Waste Management.

Photo: a typical top load 40 yd³ recycling bin and access ramp

The depots roll off container collection had an average weight of 1.67 tonnes per roll off. Which on average was 807.9 kgs for Fibre and 859.2 kgs for Comingle products.

The projected impact of the compaction implementation using 8 yd³ front load containers was to go from 24 two-compartment loads to fewer loads using a milk run front end system.



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 39 bins was issued and the successful company was Beaumen Waste Management. Each container was \$1,000 plus applicable taxes and load delivery. The bins would be used for recycling and for waste collection.

Based on the number of roll of containers and weights of recyclables, 29 containers were distributed for recycling at the three depot locations as follows:

Table 1: Bin Locations

Site	Bins
Brudenell	8
Lyndoch	8
Raglan	13

Brudenell



Lyndoch



Raglan



Project Period and Observations

For the purpose of this report, the collection time frames reported are November 2017 to April 2018 for roll off and November 2018 to April 2019 for the front-end system. The initial plan to implement the front-end bins was to be completed by fall 2016, however, due to budget deliberation issues and a delay in fabrication of bins, the project did not start until the end of 2017. It was in November 2017 that both the waste and recycling programs began to use the front-end bin collection system as designed. The initial run by the front-end truck is to have the waste picked up, with the return route for recycling. This enables the municipality to equally split costs of the services.

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,
- the health and safety of residents and staff is now better protected as there is no need for any ramp access. The ramps were a general trip hazard at all times but increased as an issue due to snow and ice in the winter, 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. Each site is equipped with a mobile step for those wanting to be a bit higher. With a roll off it was the ramp that had to be cleared, for the front-end bins each bin needs to be accessible and maintained.



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 a two hour, up to three-hour round trip. The amount of time taken for a site switch is usually is higher in winter due to site and road conditions.

The optimal improved program started in November 2018 when the implementation of front-end recycling system included a front-end waste system. 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. Once completed the waste is delivered to the Brudenell Road landfill site and the recycling collection commences in a reverse run with fibre collected one week and commingled materials the following week.

The one-way drive time of the route is approximately 1 ¾ hours. Add to this the cycle time of bin pickups at each location, another 15 minutes on average, adds ¾ of an hour. The total time taken to service all three sites is approximately 3 to 3 ½ hours, with Fibre and Comingled Containers alternating during pick up cycles. Whereas the roll of bin system was about a 2 ½ hour round trip for each location and it would take 7 ½ hours to do all three sites. The time savings and fuel usage moving to the front-end bin system is evident.

Depending on the frequency of roll off pickup, the distance and time travelled varies annually. However comparing the front end to roll off on an equal basis; it is clear that front end collection using a milk run approach is by far more efficient due to less time and distance travelled. This is due to the front-end approach only needing to travel one way to pick up and manage recyclables when combined with waste services.

Project Budget

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 964 a maximum amount of \$16,974 for capital costs and consulting support which represented 34% of blue box related costs. As per the agreement, the maximum amount allowed that the Township will receive is \$16,891.00 which is 34% of the Actual costs of \$49,678.00.

Item	Budget	Actual
Equipment (installed)	\$27,600	\$34,600
Monitoring, measuring, reporting	\$5,000	\$5,000
Site preparation & signage	\$13,500	\$11,578
Surplus 40 yd. bin sales	(-\$1,500)	(-\$1,500)
Contingency (10%)	\$4,460	\$0
Total Project Cost	\$49,060	\$49,678

Roll Off and Front End Comparison

	Roll Off		Front End	
	<i>RO Bins</i>	<i>Yards * 40</i>	<i>FE Bins</i>	<i>Yards * 8</i>
November	5	200	20	160
December	3	120	26	208
January	3	120	21	168
February	4	160	23	184
March	3	120	24	192
April	4	160	31	248
Totals	22	880	145	1160

Cost Comparison

	Roll Off		Front End	
	<i>RO Loads</i>	<i>Cost * 400</i>	<i>FE Runs</i>	<i>Cost * 450</i>
November	5	\$2,000.00	2	\$900.00
December	3	\$1,200.00	3	\$1,350.00
January	3	\$1,200.00	2	\$900.00
February	4	\$1,600.00	2	\$900.00
March	3	\$1,200.00	2	\$900.00
April	4	\$1,600.00	3*	\$1,800.00
Totals	22	\$8,800.00	11	\$6,750.00

*April Front End runs included one dedicated run for recycling @ \$900

At the initial application stage, the cost of one roll off and one front end run was less than reported here, \$300 and \$400 respectively. At the start of the project, the cost of the Front End run was revised to \$450 per recycling run provided it was done in conjunction with a waste run. Otherwise dedicated recycling runs are \$900. As well, the contractor has increased any roll off service to \$400. For the purpose of the assessment and payback calculations, the 6 month costs are annualized. As such, the annual operating costs of the two systems are:

Roll Off: \$17,600 Front End: \$13,500 Front End Savings: \$4,100

CIF Grant: \$16,891

Payback Years = Grant/Front End Savings = 4.1 years

Conclusions

In conclusion, the CIF Project 964 was a success and the Township and the Blue Box Stewards will see an increase in cost efficiency and operational effectiveness. In general, any municipality with a rear load collection equipment should consider this method to transport recyclables if it is currently using un-compacted roll off containers for its recycling program. Beyond the contractor change to the service agreement, the move to a front-end bin system has avoided immediate future increases in trucking costs.

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 truck trips and travel times. Given that the recycling system is dove tailed with the garbage run, the front-end truck is fully utilized in both directions.