



Highlands East Depot Upgrades
CIF Project Number #966

Final Report – April 25, 2019

Prepared for:
The Continuous Improvement Fund

Prepared by:
Stewart Hurd, Environmental Supervisor
Tracy Vader, Environmental Assistant

Acknowledgement

This Project has been delivered with the assistance of Ontario's Resource Productivity and Recovery Authority'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 the Resource Productivity and Recovery Authority and Stewardship Ontario accept no responsibility for these views.

© 2019 Resource Productivity and Recovery Authority and Stewardship Ontario

All rights reserved. No part of this publication may be reproduced, recorded or transmitted in any form or by any means, electronic, mechanical, photographic, sound, magnetic or other, without advance written permission from the owner.

Table of Contents

Executive Summary.....	1
1 Introduction	2
2 Program Background	2
2.1 Community Profile	2
2.2 Waste Management System.....	2
2.3 Current Waste Management Performance	4
2.4 Program Challenges	4
3 Project Description & Goals	5
3.1 Description of the Project	5
3.2 Project goals.....	5
4 Approach.....	6
4.1 Set Up and Implementation.....	6
4.2 Monitoring and Measurement	6
5 Project Results and Analysis	7
5.1 Overview of Results	7
5.2 Program Cost Analysis.....	7
5.3 Lessons Learned	7
6 Project Budget.....	7
6.1 Budget	7
6.2 Project Schedule	8
7 Conclusions	9

List of Figures

Figure 1: Map of Municipal service area and depots (green boxes)	2
Figure 2: Motors and Hydraulics for Compaction Equipment	3
Figure 3: Compactor and Bin	4
Figure 4: Operator Compactor Controls	5
Figure 5: Oversize Hopper for Compaction Units	6

List of Tables

Table 1: Program Cost Comparison	7
Table 2: Project budget and actual costs	8
Table 3: Project Schedule and Actual Completion.....	8

Executive Summary

The Municipality of Highlands East is committed to reducing the amount of waste filling up our Landfills. As a result of this commitment Highlands East is continually looking for ways to combat the waste management issues facing rural Ontario Municipalities with seasonal population patterns and large rural road networks. In 2016 the Municipality of Highlands East, in partnership with the Continuous Improvement Fund (CIF), entered into an agreement to purchase and install two compactors to improve efficiency and reduce transportation costs.

This objective was achieved by installing the new compactors at our most centralized Tory Hill Landfill site for the collection of our two stream recyclable material. The Municipality completed site upgrades to accommodate the new bins through August – September 2017. The two compactors and bins were purchased in October 2017 for a total of \$120,950.68 plus project costs of \$21,656.51 including installation, shipping and taxes. The compactors and bins were fully operational by November 2017.

The new compactors decreased the number of collections required thus reducing our haulage costs. Municipal staff compared the first nine (9) months of haulage billings between the 2017 (pre) and 2018 (post) years. From January to September 2017 we required twenty-five (25) pickups with the (50) yard bins at the Tory Hill Landfill site and ten (10) pickups with the (50) yard bins at the Bicroft Landfill site. From January to September 2018 we required thirteen (13) pickups with the compactor bins and five (5) trips with the (50) yard bins at Tory Hill Landfill site, and eight (8) trips at the Bicroft Landfill site with the (50) yard bins.

The Township shipped 164.74 tonnes of recyclable materials from the Tory Hill and Bicroft Landfills during the first (9) months of 2017 and 167.93 tonnes during the first (9) months of 2018. The average weight per load (2 bins) sent to the material recovery facility from Tory Hill increased from 4.51 tonnes (2017) using the (50) yard bins to 6.96 tonnes (2018) using the compactor bins. Haulage rates per load for 2017 and 2018 were exactly the same.

In total, the cost to implement the Compactor Bin Program was \$126,316.10 with \$40,104 in funding from the Continuous Improvement Fund (CIF). Annual cost savings for the first year (2018) were \$17,222.00 which provides the Municipality with a projected payback of 7.3 years.

For additional information regarding this project, please contact:

Stewart Hurd

Environmental Supervisor - Environmental Department
Township of Highlands East
phone: 613-339-2442
email: shurd@highlandseast.ca

1 Introduction

The Municipality of Highlands East was awarded CIF funding for this cost savings project. This project consisted of purchasing and installing two new stationary compactors and compaction containers at our Monmouth landfill site to capture mixed paper and plastics plus two bins to be kept in circulation by our hauling contractor to ensure capacity is always available at our depots. This report provides an overview of the project including an introduction, approach, project analysis and results. Information was gathered by Municipal staff using Waste Connections billing documentation. The project data commences January 2017 and ends September 2018.

2 Program Background

2.1 Community Profile

The Municipality of Highlands East is situated on the Eastern side of Haliburton County and covers 758 square kilometers. Highlands East has a permanent population of approximately 3,300 and a seasonal population of roughly 13,000 with a total of 4,300 households. The Municipality was originally incorporated in 2001 with the amalgamation of the Townships of Bicroft, Cardiff, Glamorgan and Monmouth.

2.2 Waste Management System

The map below details the locations of the five Landfills within the boundary lines of the Municipality of Highlands East. New Marathon TC-300 Stationary Compactors and 40 yard compaction containers have been installed at the Tory Hill Landfill. Highlands East operates a curbside pickup program in the Cardiff Townsite as well as in the subdivisions of Bicroft and Dyno Estates. All other residents take their waste to one of our five landfill locations depicted by green boxes on the map below.

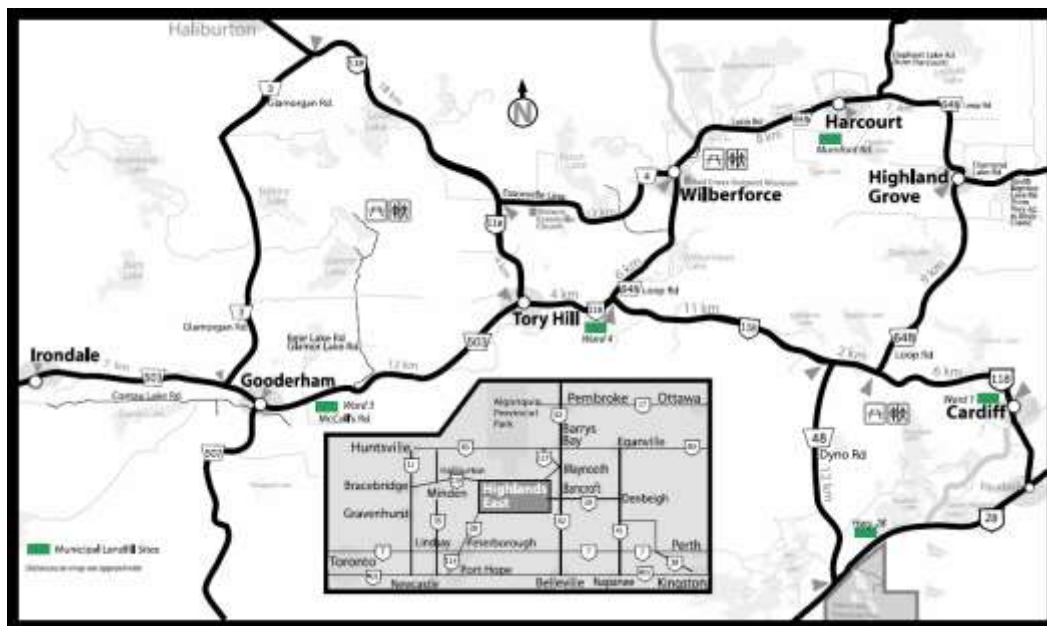


Figure 1: Map of Municipal service area and depots (green boxes)

Collection of recyclables at our landfills is achieved through a two stream collection system which are deposited into two compaction bins designated for Fibres or Containers. The Landfills are only used by residents of Highlands East. Highlands East reduces waste by operating a recycling program that diverts standard blue box materials such as glass, card board, newspapers, and various plastic. The Municipality does not accept polystyrene or plastic film through the recycling program.

The recyclables are hauled by Waste Connections of Canada to their Bracebridge Material Recovery Facility (MRF). The use of the compactors has assisted Highlands East in reducing consumption of fossil fuels by reducing the number of bin pickups required by Waste Connections of Canada.

In addition, The Municipality of Highlands East also operates diversion programs for all scrap metal, white goods (fridges, stoves and freezers), tires, electronics, batteries, plastic jugs, hazardous materials and C & D waste. With the above programs in place the only materials that are deposited in our landfills are standard non-hazardous residential, commercial waste. Processing and collection of waste is carried out at our Landfills during scheduled hours of operation. C & D material is processed on site and used as alternative cover at designated Landfill sites.



Figure 2: Motors and Hydraulics for Compaction Equipment

2.3 *Current Waste Management Performance*

Records supplied by Waste Connections of Canada indicate that in 2017 we collected 427.69 tonnes of Blue Box Material and marketed 376.24 tonnes. In 2018 we collected 429.39 tonnes and marketed 361.25 tonnes. A slight increase in material collected shows some consistency in the amount of material collected within our Blue Box program throughout the Municipality.

2.4 *Program Challenges*

The Municipality realized we were spending significant money shipping recyclables to our MRF in Bracebridge and could make our program more efficient by increasing the tonnage per load by introducing compaction equipment at our Tory Hill Landfill site. Introducing compactors does not increase the cost per load by Waste Connections of Canada as the contractor uses the same truck and trailer to haul the compactor bins as with the 50-yard bins. Savings are accomplished through the reduction in the number of trips required to transport materials to the Bracebridge MRF.

A major challenge that occurred with the compaction equipment upon start-up was ice build-up in compactors causing breakdowns which was resolved with the installation of lids on both compactor units.



Figure 3: Compactor and Bin

3 Project Description & Goals

3.1 Description of the Project

This project has resulted in an increase in the efficiency and effectiveness of the Municipal Blue Box Program reducing haulage costs, fuel usage and air emissions, along with reduction in time required by staff to ensure sufficient capacity available in bins.

The project includes the purchase of compaction equipment and compactor bins to increase the amount of recyclable material collected in each bin. The compaction equipment and bins were purchased through a competitive bidding process, as per the Municipal Procurement Policy.

To accommodate the bins, cement pads were constructed at the Tory Hill landfill.



Figure 4: Operator Compactor Controls

3.2 Project goals

The Municipality decided to install compactors at the landfill site in order to increase the efficiency of the Blue Box Program, by reducing haulage requirements to the MRF which will reduce transportation costs and overall impact on the environmental.

4 Approach

4.1 Set Up and Implementation

The Municipality estimated that a total of \$96,122 would be required for the project and was granted funding by CIF for this project as a cost savings initiative. This estimated project costs included:

- 2 Compactor Units and 4 – 40 yd Bins
- Electrical/hydro upgrades
- Cement Pads/Foundation
- Ramp extension

The purchase of compaction equipment was completed through a competitive bidding process in May of 2016. The project for the compaction equipment was awarded to Metro Compactor Service Inc. The compaction equipment was delivered to the Tory Hill Landfill site in October 2017 and commissioned in November 2017. Installation of the concrete pads and blocks and extension of the access ramp was completed by Municipal staff.

4.2 Monitoring and Measurement

Staff used Waste Connections of Canada billings and Waste Management Staff Reports from January 1st, 2017 through to September 30th, 2018. The billings (invoicing/documentation) provides staff with three items for comparison:

1. The number of hauls over the study period
2. The amount of material hauled per lift (tonnes per lift)/trip
3. The cost to haul material

This information allows staff to monitor the performance of the new compaction equipment and recognize all cost savings achieved through reduction in costs to haul material to the MRF.



**Figure 5: Oversize Hopper for Compaction Units
(Allows collection truck to dump into bin)**

5 Project Results and Analysis

5.1 Overview of Results

Results used in this report include Waste Connections of Canada billing and Waste Management Staff Reports. The timing of this information spans from January 1st, 2017 through to September 30th, 2018.

5.2 Program Cost Analysis

Data from all relevant costs from years 2017 and 2018 are compared below. The 'pre' compaction equipment data is shown in the year 2017 against the 2018 data with the use of the compaction equipment.

Table 1: Program Cost Comparison

Program Costs	2017	2018	Difference
Hauling costs			\$0
Bicroft	\$16,752	\$12,564	\$4,188
Monmouth	\$30,842	\$20,448	\$10,394
Hydro	\$1,248	\$2,303	-\$1,055
Additional Maintenance		\$0	\$0
Cost Savings for 9 months			\$13,527
Est. Cost Savings for 12 months			\$18,036

\$568	Cost from Monmouth
\$698	Cost from Bicroft

5.3 Lessons Learned

The following section is based on Waste Management Staff reports concerning the compaction bins. The compaction bins are very effective in terms of haulage cost reduction. Staff are no longer required to monitor the capacity available in the bins.

6 Project Budget

6.1 Budget

Table 2 depicts the financial planning behind our depot upgrade project. The purchase and installation of the compaction equipment was originally budgeted for \$96,122.

The final project cost was \$126,316.10. The cost of the project was over budget by \$30,196.00. The compaction equipment was purchased from Metro Compactor Service Inc. in the amount of \$107,036.

50 yard bins have yet to be sold due to previous compactor breakdowns and to allow the Municipality to collect plastic bags separate from Blue box material and direct to MRF as marketable material.

Table 2: Project budget and actual costs

Cost of Bins	Budget	Actual
Compactor total (incl. tax)	\$76,804	\$107,036
Electrical/Hydro Upgrades	\$6,000	\$4,057
Concrete pads	\$2,500	\$3,013
Fencing	\$1,600	\$1,158
Labour and equipment	\$5,000	\$11,052
Contingency 2.5%	\$2,108	
HST (1.76%)		\$2,029
TOTAL	\$96,122	\$126,316
CIF FUNDING	\$40,104	\$40,104
Municipality of Highlands East	\$56,018	\$86,212

6.2 Project Schedule

Table 3 outlines the budgeted time allocated for each major step in the project and the funding associated with it.

Table 3: Project Schedule and Actual Completion

Project Deliverables/Milestones	Approved Payment	Percent of Funding	Expected Completion	Actual Completion
Phase 1 – Purchase & Installation of compactors: photos demonstrating that the equipment has been delivered to the site and documentation confirming that capital expenditures have been incurred in connection with the purchase of this equipment Provide the CIF with confirmation that the equipment meets the installation and testing specifications outlined by the vendor	\$30,078.00	75%	April 30, 2018	January 24, 2018
Phase 2 – Final report, detailing costs & savings over 9 months of operation	\$10,026.00	25%	May 31, 2019	April 25, 2019
CIF Funds Requested	\$40,104.00	100%		

7 Conclusions

In summary, the installation of the compaction bins has increased efficiency of the Blue Box Program for the Municipality of Highlands East.

To date the following goals have been achieved:

- Reduced the number of hauls from Bicroft and Tory Hill Landfills
- Reduced cost of third party contractor to compact bins on site
- Improved density/per lift - tonnage
- Easier for staff to compact material
- An anticipated payback on invested costs of 7.3 years

The MRF has noted that they recommend the use of compactor units for Blue Box Collection Programs across the Province as an effective method to achieve significant reduction in haulage costs to their facilities.