Public Space Recycling

Prepared for : Continuous Improvement Fund Project # 637.13

Prepared By : City Of Kenora

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Annual Report

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Submitted By

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Executive summary

Kenora adopted solar powered self-compacted Big Belly for collecting recyclables at different locations within the downtown area one year ago. Kenora has installed 16 self-compacted Big Belly receptacles in partnership with Waste Diversion Ontario (WDO) and Stewardship Ontario (SO) through the Continuous Improvement Fund (CIF). As a result, 15% of recyclables have been diverted from the garbage stream after installation of the Big Belly in the downtown public space area. The use of software as well as the self-compaction technology of the Big Belly has significantly reduced the amount of collection time resulting in minimized greenhouse gas emissions. As a part of the Agreement, the City of Kenora has to submit a detailed monitoring report to the CIF on this project.

1.0 Introduction

Kenora is a small tourist City with a population of 15,838. Kenora welcomes a significant number of visitors during the summer months. The Lake of the Woods area is one of the main destinations for tourists. A large number of visitors from Manitoba, Saskatchewan and the USA visit Kenora to enjoy camping, boating, fishing and hunting. The new multipurpose dome located at the Harbourfront and the Discovery Centre were built recently by the City to increase tourist activity by providing venues for events.

The population of the City during the tourist season increases by two to three times. The city utilizes its resources to keep the city clean. The city has been collecting street litter from the public space within the downtown area from forty (40) traditional garbage bins made from cement and metal. All waste collected from downtown receptacles was diverted to the Kenora Area Landfill (KAL) site. There was no public space recycling programme in place for the downtown area.

It was realized that a significant amount of waste could be recycled from the downtown area if the proper recycling system was adopted. The City has signed an agreement with WDO and SO for partial funding under the CIF to buy solar powered self-compacted Big Belly for recycling in conjunction with a second Big Belly unit dedicated for waste at each location.

With funding provided by CIF, the City purchased 16 recycle solar powered Big Belly units and installed them at different locations within the downtown area including the Harbourfront beside the multipurpose dome. The installation was completed in November 2011. The Big Belly initiative has increased the aesthetic beauty of the street and also has increased the waste diversion rate of the city.

Another major advantage of Big Belly is its ability to send information electronically through wireless software. The Big Belly seems to be very efficient when handled properly. The operators at the transfer station are able to see the status of individual Big Belly units online and schedule them for collection as required. This definitely has helped the city to manage collection routes more efficiently as all this information is available through Big Belly Solar's website.

The City has been collecting recyclables at regular intervals from the Big Belly units when the signal changes to yellow from green. The collected material is weighed and diverted away from the landfill resulting in the increase in the diversion rate compared to one year ago when the city did not have any recycle bins in the downtown area.

Picture 1: Big Belly on Main Street with Lake of the Woods Project information.

A public survey was conducted regarding the performance of Big Belly and positive feedback was obtained from the public who frequently use the Big Belly units. 85% of the staff / public who participated indicated that they want to see more Big Belly units in other areas of the downtown which are still being served by the traditional non-recyclable bins.

The first stage of Big Belly has produced tremendous results and had a great impact on reducing collection costs as well as greenhouse gas emissions (GHG). The city is looking at further purchases of solar compacted Big Belly in the next phase of the Downtown Revitalization Project.

2.0 Performance of the Public space recycling self-compacted Big Belly in the City

- 16 solar powered self-compacted Big Belly units have been installed at different locations within the downtown area to collect recyclables from public space. Big Belly's have been in operation since November 2011.

Picture 2: Big Belly near the City Hall on the Main Street.

- Big Belly's are very efficient and environmentally friendly. Operation Department staff receives information online about their status and can schedule collection accordingly. This minimizes the collection and driving time which reduces the overall cost of collection and the cost to the environment by reducing the GHG.
- City staff does not need to collect waste every day as required when using the traditional garbage bins. Another advantage of using Big Belly is that it is very simple to operate.
- Another major advantage of using of Big Belly is its capacity of self-compaction. According to the manual the waste will get self-compacted when it reaches certain predetermined depth, which is the main benefit for the municipality to lower the cost of collection which again helps to reduce GHG. The city is able to collect larger quantities of recyclables, using the same volume capacity bags, when compared to the traditional garbage bin system.
- Another feature of the Big Belly is the added aesthetic value it brings to the downtown area. It is fact that Kenora has added additional architectural value when traditional bins were replaced with the Big Belly. It also helps to reduce blowing of litter from the bins as the old ones have this type of problem frequently when it is windy.

Picture 3: Big Belly near the Harbourfront in front of Multipurpose Dome.

3.0 <u>Impact of Big belly in the Recycling programme of Kenora</u>

- Kenora has a recycling programme in place to divert recyclables material from the landfill. Kenora, due to its geographical location, is hauling recyclables mainly paper, OCC and comingle to a recycle facility in Winnipeg, Manitoba.
- Kenora is now able to collect recyclables from the public space of the downtown area with the installation of Big Belly units. Kenora is receiving a lot of visitors during its peak season and as a result the majority of the garbage collected in the public space can be recycled provided that the proper garbage collection system is in place. Before the installation of Big Belly the downtown had only traditional garbage bins. All of the recyclables went with the waste and was diverted to the landfill due to the lack of a recycle collection system.
- With the Big Belly recycle programme, the city diversion rate from the downtown public space has been increased considerably. Figure 1 below shows that the city can manage to divert significant amount of recyclables from public space in the downtown area. The

total amount of recyclables (particularly comingle) collected from downtown public space after the installation of Big Belly within 12 months is 3796 kgs which is 0.5 % of collected recycle comingled material from the entire city . This diversion rate seems very small in comparison to the diversion rate of comingled material collected for the entire city, but when compared with the total waste produced in the downtown public space, the percentage would be much greater.

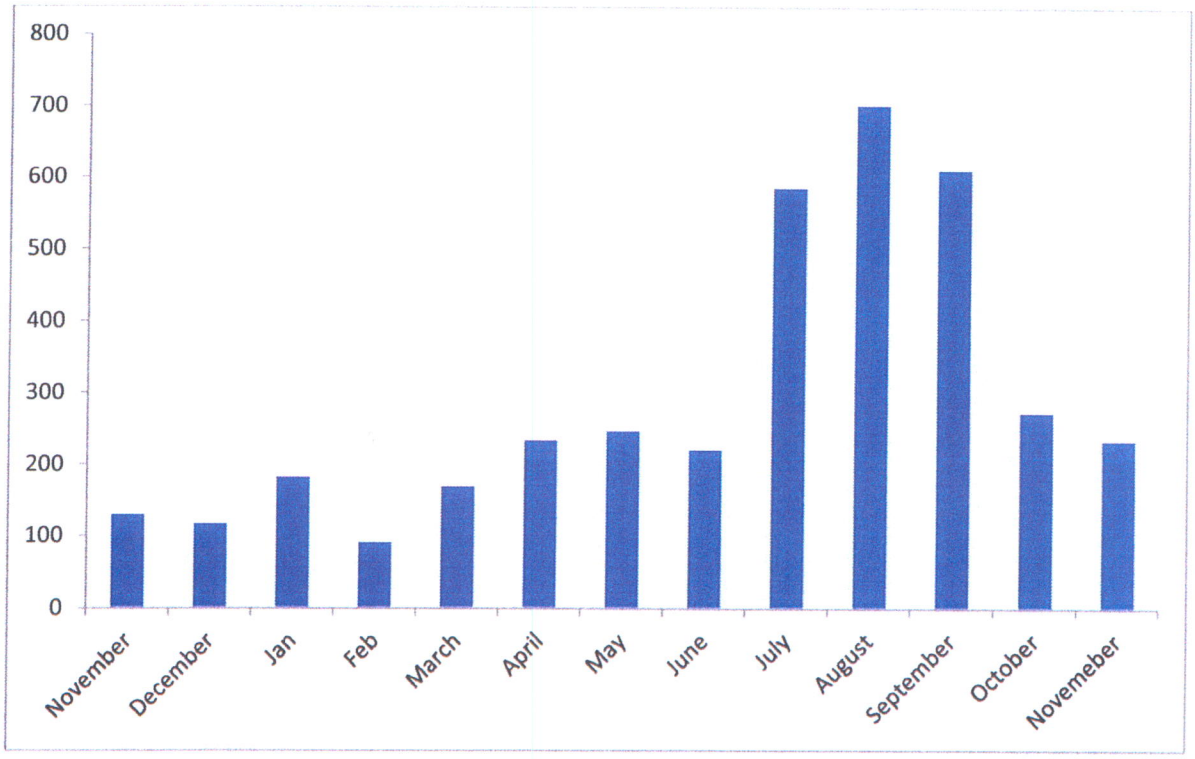

Figure 1: Monthly recycle collection in kgs from Big Belly in Downtown Area

Picture 4: Big Belly in downtown area on Main Street

- Figure 2 illustrates that during the past 12 months, the city is able to divert recyclables from the waste stream from the downtown area. With the 16 Big Belly units the City was able to divert almost 15% of recyclables from the waste stream in the downtown area.

- Only a portion of the downtown area has recycle Big Belly units. If we put additional recycle Big Belly units in other parts of the downtown area, which is still being served by traditional garbage bins, it will definitely increase the diversion percentage.

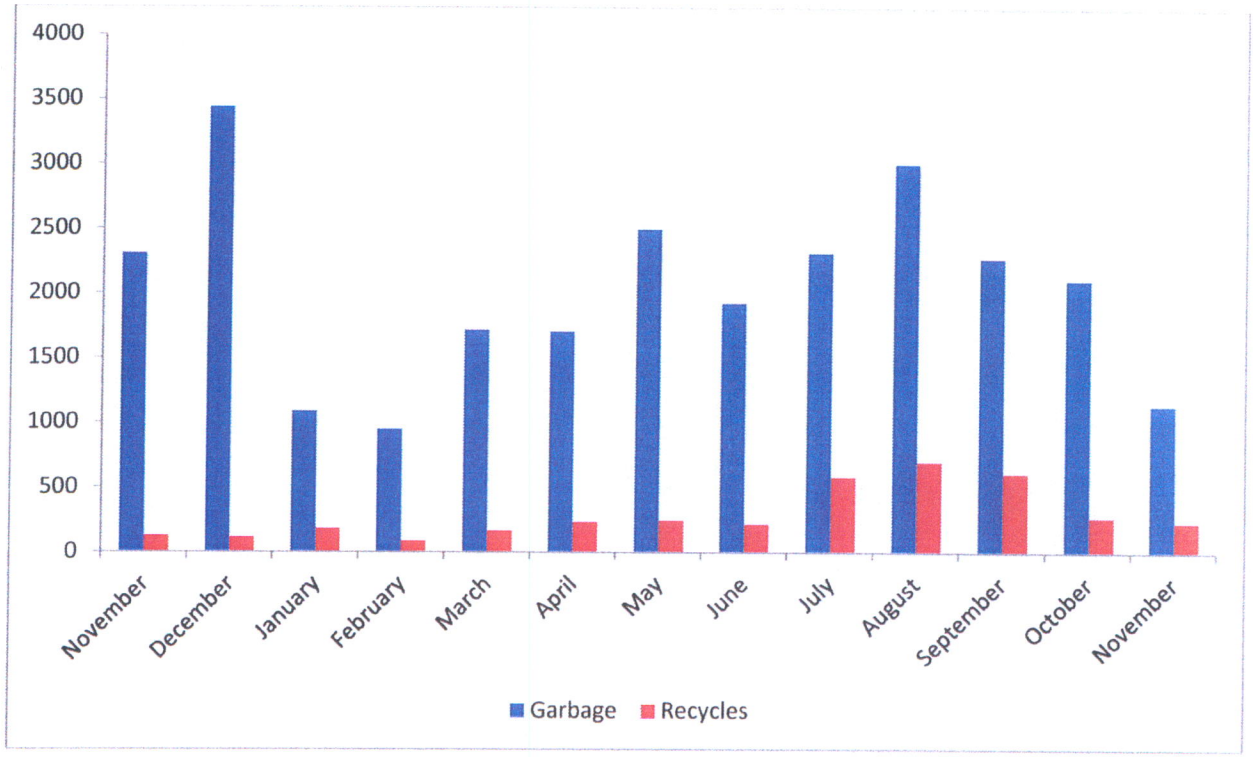

Figure 2: Monthly comparison of garbage and recyclables collection in kgs from the downtown area

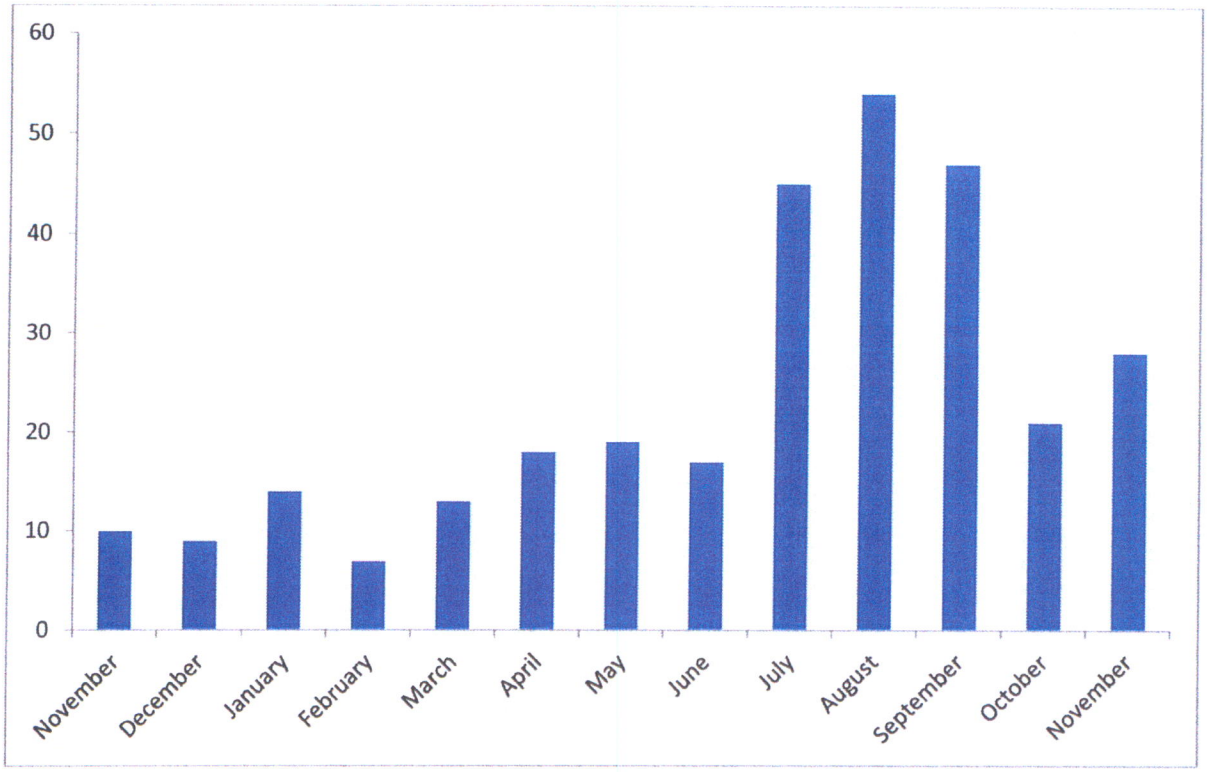

Figure 3: Frequency of recyclable collection from Downtown area in a month

- Figure 3 illustrates that the self-compacted recycle Big Belly units were emptied almost 302 times within the 12 month period. There are a total of 16 recycle Big Belly units in the downtown area. On average one Big Belly was emptied 19 times within 12 months. This fact indicates that one Big Belly was emptied almost 1.6 times in a month. It can be said that it significantly reduces collection hours and greenhouse gas emission.

4.0 Monitoring Programme

Once the Big Belly was installed, a monitoring programme for the operation was adopted. The Monitoring program includes the following.

- Status of the Big Belly has been checked online every day. Most of the time collection is scheduled when the indicator light turns yellow. Figure 4 shows that 67% of Big Belly has been collected when it is yellow. High priority is always given to collect Big Belly when it is yellow to maximize the collection efficiency.

- A spreadsheet has been maintained to keep track of the number of bags collected from the Big Belly on a daily basis. This is also compared with the data obtained online for the accuracy.
- Scheduled maintenance has been done for all Big Belly units as per manual recommendation.

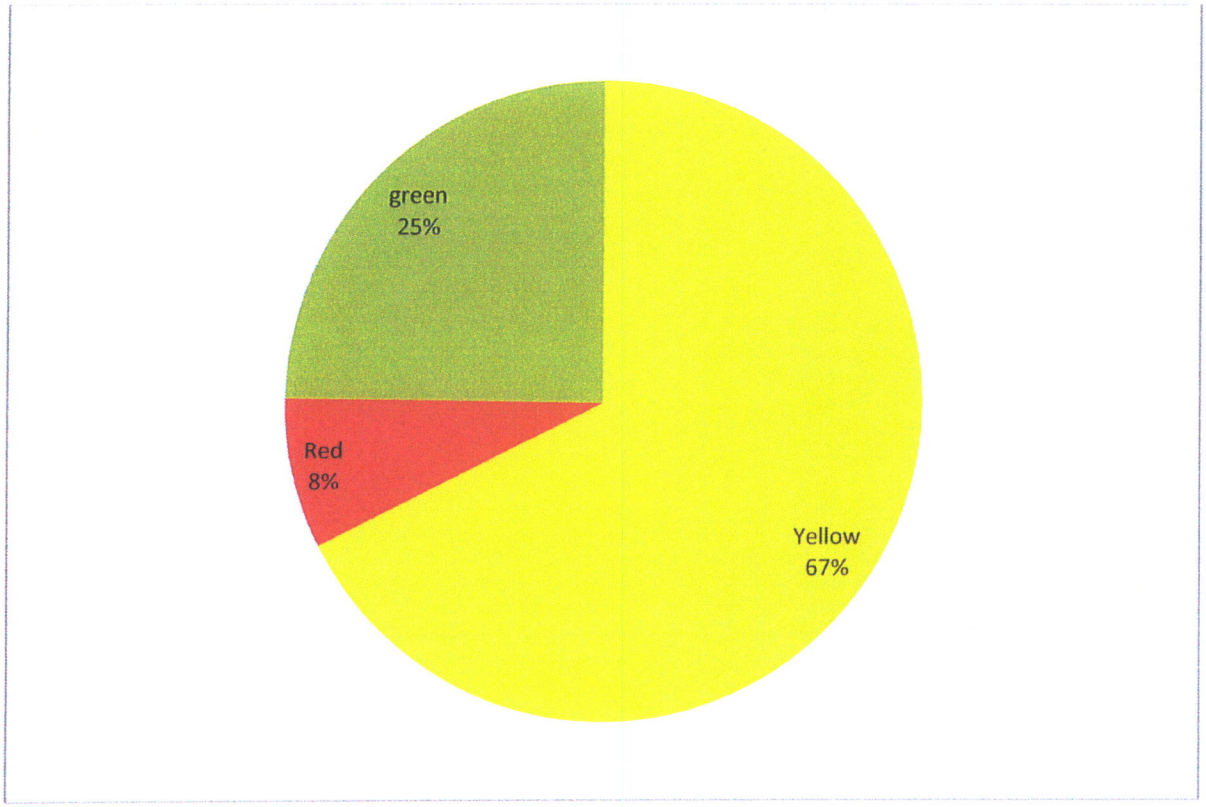

Figure 4: Percentage of recyclables collected during different stages from Downtown area up to November (Big Belly Software programme)

5.0 Quality of the material collected from Big Belly

The majority of the material collected from recycle Big Belly's are pop cans, paper, coffee cups, coffee lids, small size cardboard box, recycle bottles etc. The material goes to the comingled area at the transfer station. The majority of the units are used for recyclables. The quality of these materials varies from excellent to acceptable. Sometimes in a very rare case, public dispose their cups with coffee and tea which makes them wet making them unacceptable to be used as recycle. In such case they go to the waste steam (landfill).

6.0 Feedback on Big Belly

A survey was conducted to get feedback from the public as well as from City staff on the performance of the recycle Big Belly and recycle program. The survey had five general yes or no questions.

The survey was conducted in two different ways. City staff responded through inter office City email. For the Public the same questionnaire was posted on the city website and enough time (almost two week) was provided for their feedback.

7.0 A) Feedback from the City Staff

The Big Belly survey has received excellent feedback from City staff with a total of 40 responses documented.

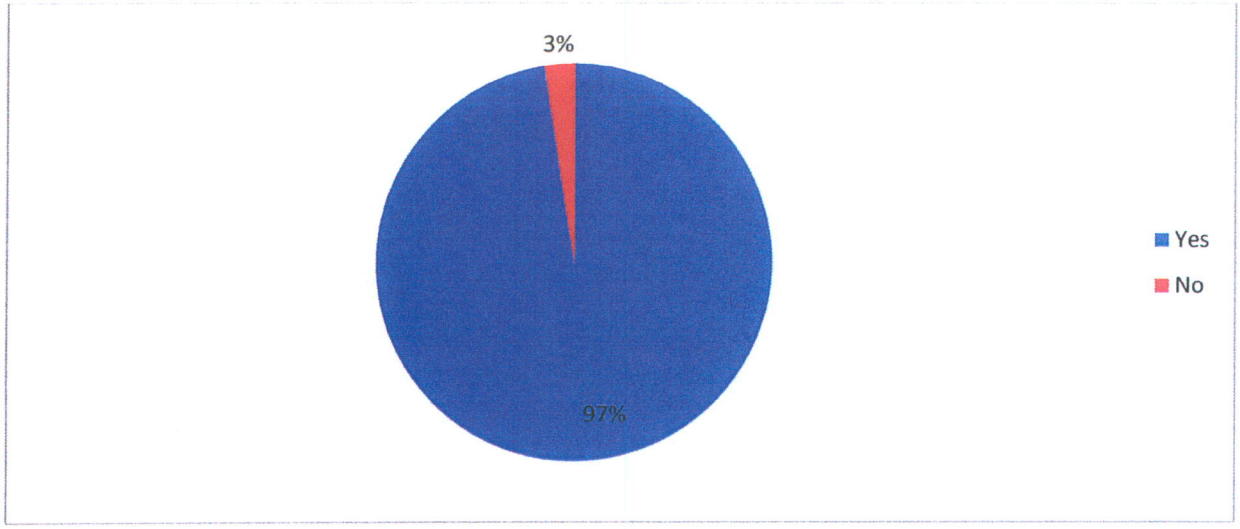

Figure 5: Survey question: 1) Did you know the Big Belly's are for recyclables?

97% of city staff, who participated, knew that Big Belly was for recyclables. 5% of city staff was of the opinion that Big Belly would not reduce garbage on the street.

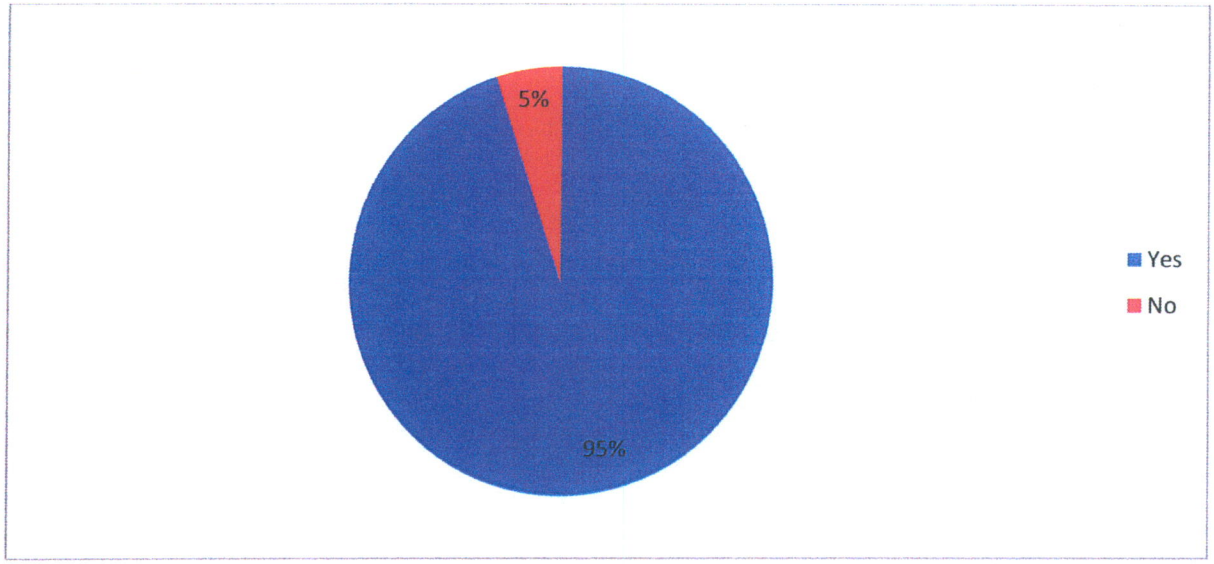

Figure 6: Survey question: 2) Do you think Big Belly helps to reduce garbage on the street?

85% of the city staff who responded to the survey wanted to see more Big Belly on other streets of the downtown area.

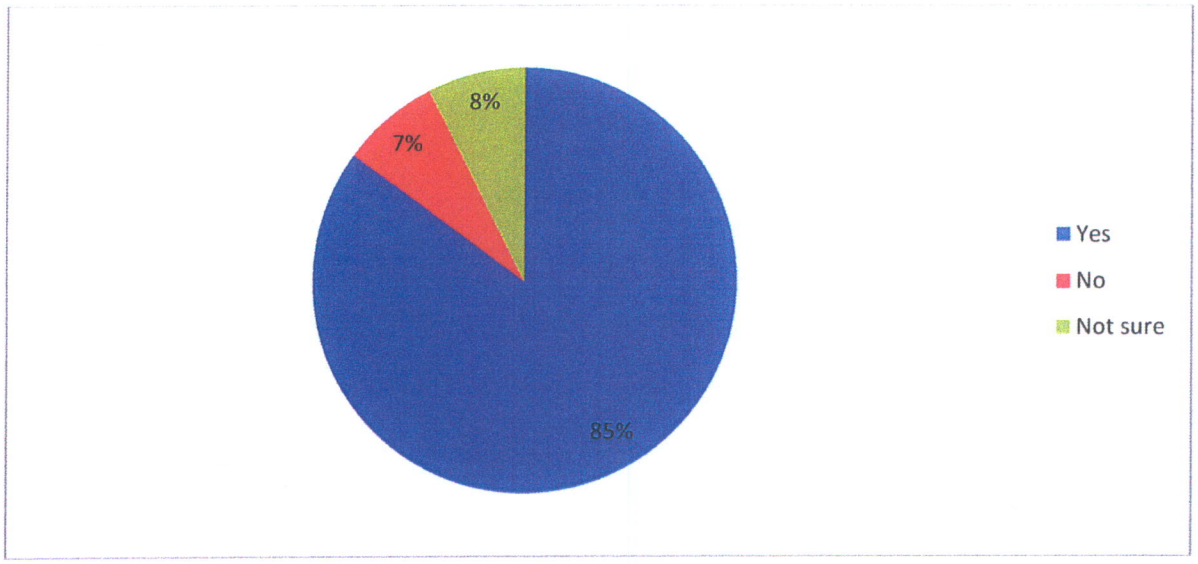

Figure 7: Survey question: 3) Would you recommend more Big Belly on other street in downtown area?

92% of city staff thinks that Big Belly's are easy to dispose of recyclable material whereas only 5% did not think so.

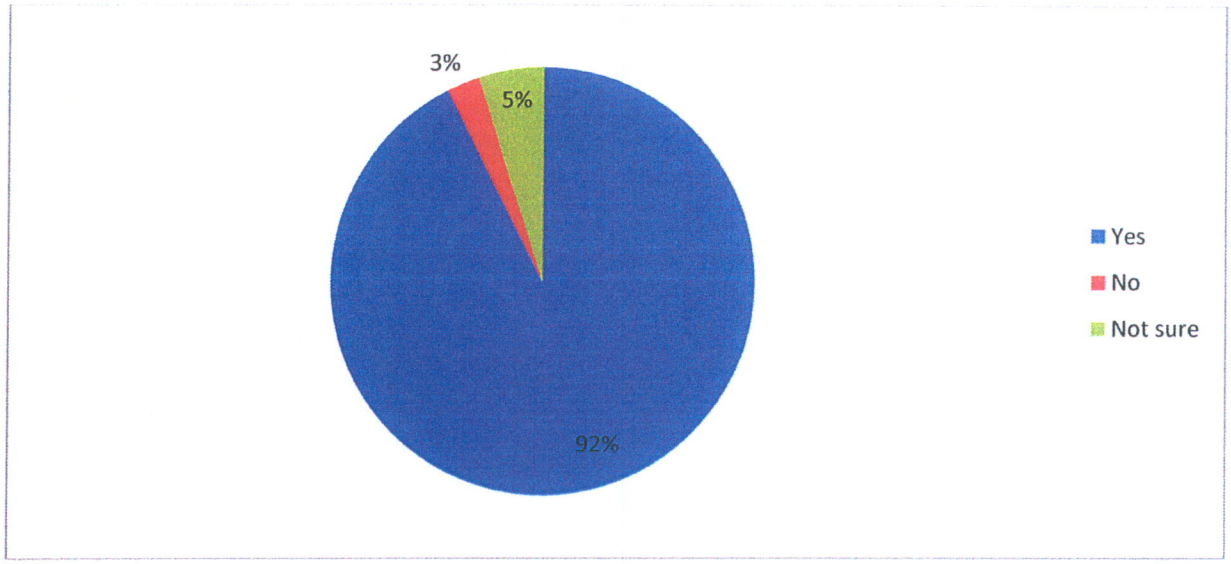

Figure 8: Survey question: 4) Do you think Big Belly's are easy to use to dispose of recyclables?

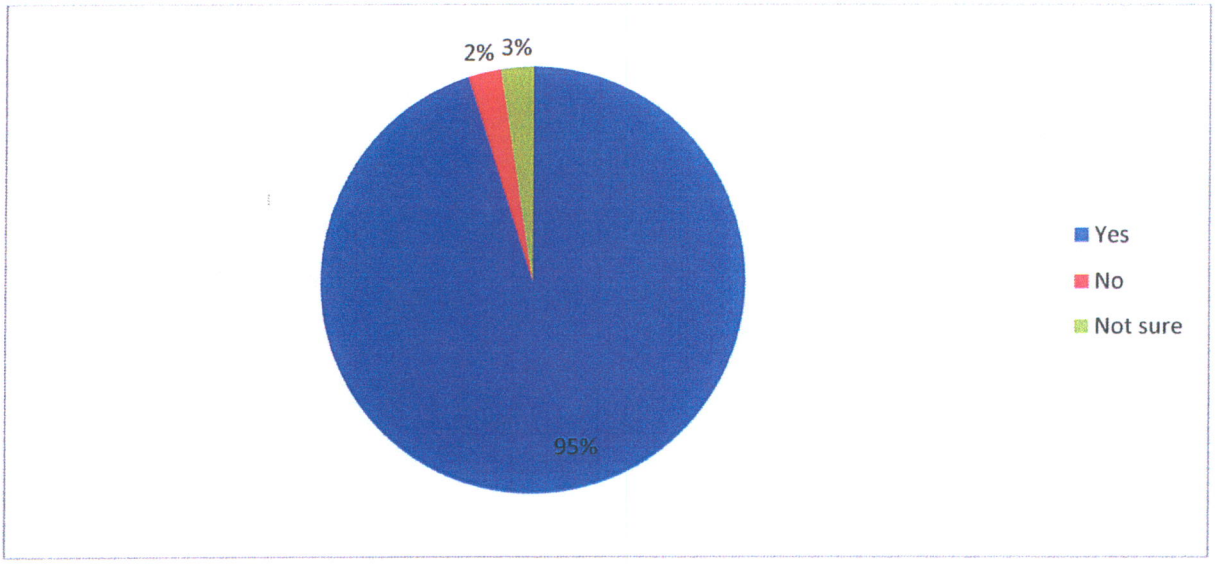

Figure 9: Survey question: 5) Do you think Big Belly's are better than traditional cement or metal garbage bin?

95% of the participant responded that they like Big Belly more than traditional cement or metals bins. 2% still like metal bins.

7.0 B) Feedbacks from the Public

A Questionnaire was provided for the public to record their opinion on the performance of Big Belly through the City website. Only 8 people responded to the survey. The results of the public survey through the City website are provided below.

1. Did you know the "Big Belly's" are for recyclables?

	Response Total	Response Percent
Yes	5	62%
No	3	38%
Total Respondents		8

2. Do you think "Big Belly's" help to reduce garbage on the street?

	Response Total	Response Percent
Yes	7	88%
No	1	12%
Total Respondents		8

3. Would you recommend more "Big Belly's" at other street locations in the downtown area?

	Response Total	Response Percent
Yes	7	88%
No	1	12%
Total Respondents		8

4. Do you think "Big Belly's" are easy to use to dispose of recyclables?

	Response Total	Response Percent
Yes	7	88%
No	1	12%
Total Respondents		8

5. Do you think "Big Belly's" are better than traditional cement or metal garbage bins?

	Response Total	Response Percent
Yes	6	75%
No	2	25%
Total Respondents	8	

8.0 Operation Cost

The main objective of the Big Belly is to reduce the operation as well as collection cost. The breakdown below shows that the collection cost goes down significantly when Big Belly is used. It also reduces the driving distance which again helps to reduce GHG.

The data below compares collection cost of 16 recycles Big Belly units with the collection cost when 16 traditional bins were used.

It is already mentioned above in the figure 3 that big belly were emptied almost 302 times in 12 months.

A) When Big Belly is used to collect recycles.

Number of Big Belly used for recycling = 16

Number of trips made to collect the Big belly in 12 month (figure 3) = 302

Total distance driven to collect recycles from Big Belly (151 @ 4 Kms) = 604 Kms

Description	Trips	Hrs.	Total Hrs.	Hourly Rate	Total Amount
Labour cost					
Collection cost	302	0.5	151	27.6	4167.6
Driving hour	151*	0.75	113.25	27.6	3125.7
Truck Cost					
Collection time	302	.5	151	15	2265
Driving hour	151	.75	113.25	15	1698.75
Total					11257

**It is assumed that two Big Belly units have been emptied in a single trip*

B) When traditional Bin is used to collect recycles

Number of traditional receptacles = 16

Everyday somebody has to make trips to see and to collect the recycles. In 12 month on average 260 trips should be made to collect the recycles.

Total distance driven to collect recycles from traditional bins (260 @ 4 Kms) = 1040 Kms

Description	Trips	Hrs.	Total Hrs.	Hourly Rate	Total Amount
<u>Labour cost</u>					
Collection cost	260	1	260	27.6	7176
Driving hour	260	0.75	195	27.6	5382
<u>Truck Cost</u>					
Collection time	260	1	260	15	3900
Driving hour	260	.75	195	15	2925
					19383

This analysis shows that the City has saved almost $8125 in one year by using 16 Solar powered compacted Big Belly while collecting downtown public space recycles.

Operation department staff saved almost 436 kms of driving distance to collect from the Big Belly when compared with traditional bin collection which again reduces a significant amount of GHG emission. The city is also saving in fuel as a lower amount of fuel is required.

9.0 Lesson learned and future steps

- With the use of the recycle Big Belly, the recycling percentage of the downtown public space has been increased from 0 to 15%. There are still some public places in the downtown area which are served by garbage bins only. These places also need recycle Big Belly units to increase the recycling percentage.
- The plan is to purchase additional Big Belly units for the downtown area in 2013. 85% of the participants in the survey expressed that they want to see more recycle Big Belly units in other areas of the downtown.
- Big Belly is very environmentally friendly and very efficient due to self-compaction. Attention should be given to collect Big Belly when the indicator light is yellow. Online data up to November shows that 67% of the Big Belly units were emptied (figure 4) when it was yellow, 8% when it was red and 25% when it was green.

10.0 Conclusion

The City of Kenora had signed an agreement with WDO and SO for CIF funding to install 16 solar powered self-compacted Big Belly units to collect recyclables at the public space in the Downtown area. There was no recycle program in this area and traditional bins were used to collect the garbage. 16 single stream self-compacted Big Belly units were installed one year ago in the public space in downtown area. The computer software has been set up at the transfer station. As a result, 15% of recyclables have been diverted from the waste stream from the downtown public space area. Good public/staff feedback was received regarding the performance of the Big Belly initiative. The collection cost analysis also indicates that the city has saved resources, manpower and significantly reduced GHG emissions.