

Mobile Education Unit Final Report

Continuous Improvement Fund Project # 276

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1.0	INTRODUCTION	3
1.1	Purpose & Scope	3
1.2	Project Description.....	4
1.3	Goals	5
2.0	IMPLEMENTATION DETAILS.....	6
2.1	Project Initiation	6
2.3	Concept and Activity Design Development	7
2.4	Vendor Communication	9
2.6	Project Launch.....	10
3.0	Obstacles.....	10
3.1	Delayed Completion Date	10
3.2	Budget Constraints.....	10
3.3	Quality vs. Quantity	11
3.4	Winter Usage	11
3.5	Programmer Updates.....	12
4.0	PROGRAM RESULTS TO DATE	12
4.1	MEU Usage.....	12
4.2	Data.....	12

List of Tables:

Table 1- Goals of Mobile Education Unit.....	5
Table 2 – Implementation Timeline.....	6

List of Figures:

Figure 1 – MEU Exterior.....	7
Figure 2 – The Green Grocery.....	7
Figure 3 – The Smart Home.....	8
Figure 4 – Lifecycle Lane.....	8
Figure 5 – The Waste Plant.....	9
Figure 6 – MEU Launch.....	9

1.0 INTRODUCTION

The County of Simcoe (the County) is located in South-Central Ontario, and is comprised of 16 member municipalities; Adjala-Tosorontio, Bradford West Gwillimbury, Clearview, Collingwood, Essa, Innisfil, Midland, New Tecumseth, Oro-Medonte, Penetanguishene, Ramara, Severn, Springwater, Tay, Tiny and Wasaga Beach. Approximately 127,000 households receive recycling collection services from the County with these households dispersed over an area of 4,840 square kilometres. The majority of the population is located in settlement areas, with the remainder scattered through rural areas that make up the bulk of the land area within the County. The County is experiencing significant population growth, and as a result, increased demand for municipal services such as waste management.

The County assumed responsibility for waste from the member municipalities in 1990. Since that time, the County has established a number of programs that have significantly increased waste diversion, including standardization of recycling services in all municipalities including the green bin and the expansion of the blue box program.

Factors that contributed to the need for an improvement in the quality of public education were:

- Significant population growth resulting in increased demand for municipal services such as waste management,
- Limited disposal capacity, with approximately 6.5 years remaining at current fill rates,
- The County lacks a large media outlet that reaches the entire population making distribution of important communications very difficult,
- Current public education programs were becoming stagnant, resulting in lack of uptake,
- Additional promotion and education was required to support recent waste diversion initiatives including:
 - Residential green bin program launched in 2008
 - Expanded recycling program in 2008 & 2012
 - 'Learning & Living Green' program launched in 2010 which provided organics and recycling collection in 100+ schools which is consistent with the County's curb-side program.

1.1 Purpose & Scope

The main objective of the County's Mobile Education Unit (MEU) is to further increase waste diversion and reduce waste generation rates within the County of Simcoe. The Waste Management Strategy that was developed in 2010 notes that the annual budget allocation for

additional diversion consists largely of funds for promotion and education, and should be in the order of \$7 or more per household over the first five years of implementation. The MEU was developed in order to increase outreach and to do it in such a way that the experience is enjoyable, attracting the public and ensuring that the information is retained.

The target audience is primarily children as the MEU is frequently used at schools in conjunction with the Learning & Living Green (L&LG) program, which became effective in September of 2010 and offers a uniform recycling and organics collection service to school boards within the County equivalent to that of the residential collection program (see CIF project #277). However, the MEU was designed to appeal to a broad range of age groups such that it could be utilized for outreach to community groups and at various special events located throughout the County. The Blue Box Program Enhancement & Best Practices Assessment states that “one of the factors of an effective P&E program which positively affects program performance is one that is collaborative with schools, civic organizations & youth groups”.

The interactive touch screen components of the MEU were developed in recognition that children are technologically inclined and are more likely to retain the information provided when it is in a relatable, enjoyable format. By incorporating this modern method of communication with a topic (waste management) that is typically considered mundane, the MEU provides an innovative and appealing way to communicate our message that combines education and entertainment, creating an “edu-tainment” form of outreach.

Due to the fact that the County of Simcoe covers a large geographic area in excess of 4,800 square kilometres, the mobile concept of the MEU was developed in order to be able to reach the maximum number of participants as efficiently as possible. Schools and community groups often do not have the budget for trips to a permanently located education centre, and by having our educational outreach as a mobile unit, our staff can access those schools, groups, and special events no matter the distance within the County.

1.2 Project Description

The MEU is a thirty foot trailer that is towed behind a bio-diesel fuelled pick-up truck which travels across the County and visits schools, local fairs, and other events. This ‘travelling classroom’ is wrapped in wall to wall graphics both on the exterior and interior, and inside contains various interactive educational activities which promote the County’s waste management programs and encourage waste reduction and diversion. The activities are designed to target the technologically inclined youth of today’s generation and features four different interactive stations consisting of a total of six 24” touch screens and eight digital photo screens. The MEU also features flooring made of 100% recycled tires and LED lighting.

Overall, the MEU is a unique promotion and education tool used to educate residents about the County of Simcoe's curbside diversion programs.

1.3 Goals

Table 1 - Goals of Mobile Education Unit

<p>Goal #1: Increase awareness of waste diversion initiatives - this is gauged by:</p> <p>Analysis of capture rates of recyclable materials to determine if there is an increase in the capture rates of recyclable materials</p> <p>Analysis of contamination rates to determine if there is a decrease in contamination rates within divertible materials set out for collection</p> <p>Analysis of participation rates to determine if more residents are participating in diversion programs</p>	<p>Strategies: Improve the quality of public education by:</p> <p>Creating a fun, entertainment-based learning atmosphere in which to engage residents such that they are more apt to retain the information presented</p> <p>Implementing interactive activities that aid in 'experiential' learning or learning by doing and learning through repetition</p>
<p>Goal #2: Effectively target youth in order to influence adult behaviour with respect to environmental initiatives in the home</p>	<p>Strategies:</p> <p>By utilizing activities that were technology based, essentially video games, that youth would be engaged by</p> <p>By designing games geared towards day to day life choices related to waste management</p>

2.0 IMPLEMENTATION DETAILS

2.1 Project Initiation

Research into the development of the MEU included investigation of marketing tools utilized by large companies at trade shows and at events which they sponsored. During this time, County staff also attended the Solid Waste Management Association of North America (SWANA) conference in Long Beach, California. The City of Long Beach had a mobile classroom on display at the tradeshow which provided further concepts for consideration. Variables that were taken into consideration during the research process that would ultimately affect the type of unit included target audience, budget and staffing constraints, as well as the size and type of tow vehicle if required. The County then developed a number of concepts for the various interactive activities within the MEU in order to address the overall objectives, which were to increase waste diversion through increased program participation and to decrease waste generation rates. A procurement process was used to obtain the services of a qualified vendor to further refine the County's concepts for the MEU and to complete the project. See Table 1.0 for implementation timeline.

Table 2 – Implementation Timeline

Task / Activity	Implementation Details	Date(s)
Research & Development	MEU vision & concepts	January - March, 2010
Procurement	Procurement process utilized to obtain services of a qualified vendor to develop the MEU Request for Proposal (RFP) released	March 30, 2010
	RFP closed	April 13, 2010
	Letter of award issued to successful vendor	July 14, 2010
Staffing Requirements	Full time Promotion and Education Co-ordinator hired to enhance public education programs including operation of the MEU	January 1, 2011
MEU Development & Construction	County of Simcoe staff worked with vendor on design and development of the MEU Vendor construction of MEU took place over a 9 month period.	August, 2010 – April, 2011
MEU Completion	County took possession of MEU.	April 11, 2011
Media Launch	Media launch of the MEU at local school	April 21, 2011

2.3 Concept and Activity Design Development

The basic concept of the MEU was developed; an interactive trailer wrapped in wall to wall graphics (Figure 1) on both the exterior and interior, containing educational activities which promote the County's waste management programs. The activities mimic the lifecycle of products from point of purchase, through use in the home, to collection and finally processing with each activity focusing on relevant aspects of waste management including waste reduction, resource management, sustainability, and proper diversion, all with the goal of reducing waste generation, increasing capture rates and reducing contamination rates in County diversion programs. The activities were designed to appeal to today's technologically inclined youth, featuring four different interactive stations consisting of six 24" touch screens and eight digital photo screens. The activities are depicted on a streetscape with each interior wall identified by different street signs named Diversion Drive, Lifecycle Lane and Recycle Road. There is also a small area upon the main entrance/exit of the MEU called Information Alley which provides brochures, newsletters, calendars, and other print material offering information on the County's programs. See Appendix 1 for concept plans of the MEU exterior and interior.

Figure 1 – MEU Exterior



The Green Grocery (Figure 2) is the first activity station where players must select the most environmentally friendly product option for each item on their shopping list by dragging and dropping the selected product into their virtual grocery cart in order to make it to the checkout. As the player works through their grocery list, each item presents either two or three options from which to choose. There is always one product included in these three options that is the best choice in terms of packaging and waste reduction, conservation of natural resources and the ability to be diverted through the County's waste diversion programs. For example, the participant is given the choice of a juice jammer, juice carton, or a concentrated juice container while shopping for juice. If the participant selects the juice jammer there is a message that says the juice jammer is not accepted in the blue box program and to choose another option. Both the juice carton and the concentrated juice container options will prompt a message that says the containers are acceptable in the blue box program, however the concentrated juice option congratulates the player on selecting the best option in terms of waste reduction as there is less packaging required for the concentrate. This

Figure 2 – The Green Grocery



activity communicates the importance of following the 3 R's when shopping as well as the importance of selecting products which have recyclable packaging in the County's programs.

Figure 3 – The Smart Home



The second activity within the MEU is the Smart Home (Figure 3). The premise of this game is to promote recycling in every area of the home. Upon activating the game, the player is encouraged to select a member of the Smart family to act as their avatar, providing instructions and tips while taking the player on a virtual tour through the home. The player must select an area to explore, and as the player moves through the home, waste items that are typically generated in each area are highlighted to attract the attention of the player. The participant then chooses the proper waste management method by dragging and dropping the item into one of the icons at the bottom of the touch screen. The icon options include the blue bin, the grey

bin, the green bin, a sign that reads “To the Waste Facility” and a phone icon which allows the participant to call “Customer Service” for a tip. This activity communicates the importance of capturing recyclable materials within all areas of the home, (extending the focus from the kitchen alone to other areas of the home such as the bathroom where there are shampoo bottles or toilet paper tubes that can be diverted) thereby increasing capture rates and decreasing contamination rates in the curbside diversion programs, while also raising awareness of waste facility diversion programs.

Figure 4 – Lifecycle Lane



Spanning the entire front wall of the MEU is the next activity; Lifecycle Lane (Figure 4). Visitors can view each of the eight digital photo screens which sequence through the lifecycles of common recyclable materials and provide information on the importance of diversion as well as education about landfill waste disposal. Arrows extend from the digital screens into the related cut out images of the curbside bins. For example, one of the screens which has an arrow extending into the blue bin focuses on plastic

bottles. The screen rotates through the lifecycle of a plastic bottle; providing the information that plastic is made from a non renewable resource (petroleum products), how there are many different kinds of plastic, how plastic bottles are collected, transported, and processed, and what type of materials can be made from the recycled material (such as polar fleece, carpet, or new molded plastic items). The objective of this activity is to relay the importance of capturing divertible materials in the County programs, thereby reducing waste.

Figure 5 – The Waste Plant



The final activity within the MEU is the Waste Plant (Figure 5) where waste items, such as a laundry detergent jug, aluminum foil, egg carton, broken toys, etc, whisk by on a virtual conveyor belt. The participant must correctly sort the items into the blue bin, grey bin, green bin or garbage bin in order to achieve a high score. The better the player does, the faster the conveyor belt moves in order to increase the challenge. The objective of this activity is to fine-tune the participant's diversion skills to become second nature, increasing capture rates of acceptable divertible materials and decreasing contamination rates as participants learn through experience and repetition.

2.4 Vendor Communication

A project launch meeting was held with the selected vendor in the initial stages of the project to discuss the expectations and prepare the exhibit outlines for further development. Communication between the Project Manager and County staff was constant throughout the development process. Most communication during the development of the process occurred by email and phone, but various meetings were held both at the County and at the vendor's location to discuss milestones. All creative work required approval by County staff prior to assembly and completion. Communication with the vendor was a vital component of the development process in order for the final product to be consistent with the County's vision.

2.5 Promotion & Education

A dedicated Promotion & Education Coordinator was retained by the County in January 2010. This position was developed in order to further enhance the County's waste management promotion and education program, including the operation of the MEU.

The MEU was primarily promoted to teachers and principals as a promotion and educational tool available at no cost as a component of primary grade students' environmental curriculum and in support of the Learning & Living Green Program. The MEU is communicated through e-blasts sent to educational personnel. The MEU was also advertised online at the County of Simcoe website and promoted in the annual Collection Calendar.

Figure 6 – MEU Launch



2.6 Project Launch

The MEU was completed and launched in late April, 2011 at the elementary school Our Lady of Grace located in Angus (Figure 6). Selected classes were invited to attend a launch party which included presentations by the County and school board officials, visits through the MEU as well as other outdoor educational activities and distribution of promotional materials to the attendees.

3.0 Obstacles

3.1 Delayed Completion Date

The original intended completion date was December 1, 2010. This completion date was set in order to allow time for Solid Waste Management Staff to familiarize themselves and be trained in driving and operating the unit. As the project developed and material was submitted to County staff for approval, it became apparent that more time was required than was originally projected for the development and approval process as the vendor's content often did not meet the County's requirements. This required further corrections and approvals and resulted in inevitable delays with each revision. In addition, any concept revisions required re-costing which took a significant amount of time. Ultimately the MEU was finally received on April 11, 2011; four months later than expected.

As a result of the delayed completion date, many pre-booked school and community events with the MEU had to be pushed back. The delay in delivery also restricted the number of staff that was able to receive training prior to the launch of the MEU. As a result of the delayed delivery date, the original estimates made for the number of schools to be reached with the MEU in the 2011 school year were not able to be achieved.

3.2 Budget

Due to the innovative nature of the Mobile Education Unit, there was no similar public education tool in use in the province of Ontario from which results could be drawn upon to validate the expenditure versus the expected results. The MEU budget was approved by County Council as part of a larger project related to provision of recycling and organics collection service through a partnership with the local school boards which County Council was fully supportive of.

The total cost of the Mobile Education Unit was \$196,300. This includes the custom designed trailer, electrical/heating/cooling, design services, graphic wrap and custom software and graphics for the interactive games. A tow vehicle was purchased for \$29,000. The annual operating cost is \$65,000. The Continuous Improvement Fund (CIF) provided a project grant of \$45,810.

3.3 Quality vs. Quantity

It was originally contemplated that when bringing the MEU to a school, all of the school children would be able to visit the MEU. However, when put into practice, it was determined that it was not feasible to provide a quality experience for all of the children as there is simply not enough time in a school day for each child to go through the unit and have a quality experience with each activity. An unexpected limitation was the parking availability at the school; the MEU is most often parked in the areas where school buses park to drop-off and pick-up children, and therefore the MEU can only visit the school within a certain scheduled time before buses arrive on site. Furthermore, it was also noticed that the amount of children that can be in the MEU and remain engaged in an activity is approximately 12 to 15 children. It was decided to narrow the school visits to grade 3 to 5 students, as this age range was the target age for the MEU activities, and limiting the MEU to this age range will also allow for the MEU to stay fresh for new students each year entering this grade range.

3.4 Winter Usage

Staff have experienced some problems in the functionality of the MEU during the MEU's first winter:

- **Winter driving:** As the contents of the MEU are light, driving the MEU during the winter months proved to be challenging.
- **Damage to digital photo screens:** Exposure of the digital photo frames to cold temperatures was detrimental to the equipment and resulted in permanent damage to screens.
- **Software/equipment functionality:** Cold temperatures have affected the MEU equipment resulting in touch screens which fog up from condensation due to temperature variations. The temperature also has a negative impact on the touch screens which run off the electrostatic connection between your finger and the screen, therefore users cannot wear gloves.

It was ultimately decided to take it off the road for the winter. This period of time was then utilized for scheduled maintenance.

3.5 Program Updates

The County of Simcoe added new items to the blue box program during the Spring of 2012. The interactive activities within the MEU were required to be updated to reflect these changes. Due to the unique nature of the MEU and its software, the County faced challenging obstacles in locating a programmer which suited its needs. Also, budget constraints became an issue during this time as staff did not recognize the extent of the project initially.

4.0 PROGRAM RESULTS TO DATE

4.1 MEU Usage

The milestone to be achieved with the interim report was to utilize the MEU at 40% of the events anticipated in the first year. The target was to utilize the MEU a total of 55 times in its first operational year, including 15 public/outreach events. The 40% target was achieved as the MEU has attended 25 of the anticipated 55 events, or 45%. This number excludes the various waste industry and association events which the MEU was featured at as a new P&E tool. Unfortunately, due to the delayed delivery date the original estimate for the number of schools incorporated in the target of 55 MEU visits was not able to be achieved as only 5 schools were able to be reached prior to the start of the school summer vacation.

To date, the MEU has been present at 60 outreach events to date with a total of 7112 attendees. See Appendix 2 for the list of events and number of attendees at each.

4.2 Data

To determine the effectiveness of the MEU in meeting the goals identified in section 1.3, a recycling activity was undertaken with students on their household waste both prior and subsequent to the MEU visiting their schools. Analysis of the activity results indicates that:

- The capture rate of recyclable plastics increased by 6.2%, aluminum containers increased by 6.5% and recyclable glass bottles and jars increased by 7.4%.
- The contamination rate in recyclable materials decreased by 22%.
- The students' participation at home in the County's curb-side waste diversion programs increased by 4% in the recycling program and 4% in the organics program compared

with that reported prior to the students visiting the MEU. Furthermore the rate of the children actually assisting their parents with recycling at home increased by 10%.

Studies to determine the overall participation rate in the County's residential recycling and organics programs are undertaken on a quarterly basis. Participation studies both prior and subsequent to the development of the MEU indicates that participation in the recycling program increased by 3.5% and participation in the organics program increased by 13.25%.

The County sought further feedback on the MEU through a variety of means in order to measure the success of the project:

Feedback forms were distributed to MEU visitors at local events. To date, 574 forms have been completed at 11 different events. Data from these surveys indicates that:

- 98% of respondents found the MEU to be a more effective communications method than a newspaper or radio advertisement,
- When asked to rate their experience in the MEU on a scale of 1-5 (5 being the best), 97% of respondents rated their experience as a 3 or higher, with the majority (83%) rating their experience at a 4 or higher,
- 98% of respondents rated the level of information in the MEU as a 3 or higher when asked to rate how informative the MEU was about the County's waste management programs, with the majority of respondents (90%) rating the information at a 4 or higher,
- 82% of respondents indicated that they had learned something they didn't know before visiting the MEU,
- 98% would recommend visiting the MEU to a friend,
- 75% of respondents correctly identified that aluminum foil can be recycled in the blue bin after visiting the MEU. This is felt to be significant as data collected during a comprehensive waste audit conducted by the County in 2010 indicated only a 25% capture rate for aluminum foil.

Feedback was obtained from teachers through a survey to determine the effectiveness of the MEU in targeting youth to achieve the County's goals. Data from these surveys indicates that:

- Based on the students' reactions and feedback, the teachers were asked to rate the students' overall experience in the MEU on a scale of 1-5 (5 being best). The average rank was 4.
- Teachers were asked to rate how effective the interactive activities were as a method of learning for the students on a scale of 1-5. The average rank was 4.5.
- The teachers were asked if they would recommend the MEU to other teachers as an educational classroom activity. They all answered yes.





Rendering View



Mobile Trailer -Outside view - back





Rendering View



Mobile Trailer -Outside view - front





Rendering View



Rendering View



Mobile Trailer -Side 1, Elevation view





Rendering View



Mobile Trailer -Side 2, eye level view





Rendering View



Mobile Trailer -Side 2, Elevation view



List of MEU Events

Event	Location	Date(s)	Number of people in attendance
MEU Launch @ Our Lady of Grace	Angus	April 21, 2011	50
St. Paul's	Alliston	April 28, 2011	300
Our Lady of Grace	Angus	April 29, 2011	275
Gardening Fair	Oro-Medonte	May 7, 2011	250
Beaver Scouts	Bradford	May 11, 2011	30
Pitch In Day	Innisfil	May 14, 2011	50
WDA conference	Hockley Valley	May 18, 2011	60
Meeting of School Board Environmental Representatives across Ontario	Midhurst	May 19, 2011	30
St. John Brebeuf	Innisfil	May 20, 2011	180
County Council	Midhurst	May 24, 2011	50
CIF Workshop	Barrie	June 9, 2011	30
Innisfil Summerfest	Innisfil	June 10 – 12, 2011	495
Holy Family	Alliston	June 13 & 14, 2011	177
1 st Nations Day	Ramara	June 21, 2011	98
Municipal Educators Forum	Barrie	June 22, 2011	20
Inspiring Families	Innisfil	June 25, 2011	174
Explorations Green Day Camp	Collingwood	July 7, 2011	35
Thornton Summer Camp	Thornton	July 13, 2011	22
Angus Summer Camp	Angus	July 13, 2011	30
Town of Southgate	Midhurst	July 28, 2011	7
Tiny Summer Camp	Tiny Township	July 29, 2011	35
Potato Fest	Alliston	August 5 – 7, 2011	194
Washago Music Fest	Washago	August 13, 2011	50
Corn Fest	Thornton	August 14, 2011	95
Carrot Fest	Bradford West Gwillimbury	August 20, 2011	293
Barrie Fair	Cookstown	August 26 & 27, 2011	300
Savour Simcoe	Midhurst	August 28, 2011	116
Salmon Fest	Angus	September 10, 2011	76
Oro's World Fair	Oro-Medonte	September 15 – 17, 2011	407
Collingwood Municipal Day	Collingwood	September 20, 2011	439
Our Sacred Heart School	Midland	September 22, 2011	80
Pretty River Academy	Collingwood	October 3, 2011	25
Elmvale Fall Fair	Elmvale	October 6-8, 2011	405
Wasaga Think Smart Show	Wasaga Beach	October 15 & 16, 2011	150
Public Education Session – Municipal Day	Adjala-Tosorontio	October 22, 2011	20
Bring Your Kid to Work Day	Midhurst	November 2, 2011	15
Sir William Osler Public School	Bradford	November 7, 2011	75
Hillsdale Elementary School	Hillsdale	November 16, 2011	100
Nottawa Elementary School	Nottawa	November 30, 2011	25

Mundy's Bay Public School	Midland	December 8, 2011	75
Admiral Elementary School	Collingwood	February 2, 2012	50
Wasaga Beach Brownies Group	Wasaga Beach	February 22, 2012	60
Birchview Dunes Elementary School	Wasaga Beach	February 27, 2012	50
Birchview Dunes Elementary School	Wasaga Beach	March 19, 2012	89
Birchview Dunes Elementary School	Wasaga Beach	March 21, 2012	60
Huronian Centennial School	Elmvale	April 17, 2012	80
Penetanguishene Hospital - Earth Week Event	Penetanguishene	April 18, 2012	35
Midland Hospital - Earth Week Event	Midland	April 18, 2012	150
Huronian Centennial School	Elmvale	April 19, 2012	75
SCDSB – Parent Connect Day	Midhurst	April 21, 2012	2
Museum at the Boyne	Alliston	April 21, 2012	30
Innisfil Library Event	Innisfil	April 26, 2012	80
Cookstown Library Event	Cookstown	April 26, 2012	80
Stroud Library Event	Stroud	April 27, 2012	30
Midland Home Show	Midland	April 28-29, 2012	400
Canadian Martyrs Elementary School	Penetanguishene	May 2 & 3, 2012	125
Bradford Brownies	Bradford	May 8, 2012	20
Innisfil Pitch in Day	Innisfil	May 12, 2012	80