



***FURNITURE RECYCLING AT DALHOUSIE UNIVERSITY –  
AN ANALYSIS OF THE HALIFAX DUMP AND RUN***

***SUST/ENVS 3502***

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**APRIL 17, 2015**

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## **EXECUTIVE SUMMARY**

The Halifax Dump and Run is an annual community event organised by Saint Mary's University Environmental Society and Dalhousie University Sustainability Office. It collects unwanted items from students at the end of each academic year to sell at low cost to the public. All proceeds are donated to local charitable organizations, as well as remaining unsold material (Halifax Dump and Run, 2013a). This student-run program contributes to local sustainability by creating environmental, economic and social benefits for Dalhousie campus and the Halifax community. These impacts include diverting waste from landfills and providing economic benefits to local charities (Halifax Dump and Run, 2013a). This research report aims to provide an in-depth analysis and investigation into the Dump and Run program.

It is the opinion of the research team that the current program has the potential to be even more effective and beneficial, and that an investigation of the program deliverables would be valuable in determining true sustainability potential of the Halifax Dump and Run. When compared to similar reuse programs at other universities the Halifax Dump and Run measurably lacks. Background research revealed that the Ottawa University's Furniture Reuse Program generated approximately \$2.4 million between 2009 and 2011 (Morin, 2011). The research conducted in this project provides valuable insight for the Dump and Run, while recommendations highlight areas where the program can provide better service.

This research project used quantitative research methods, conducting an interview with the lead co-ordinator of the Halifax Dump and Run in order to calculate program deliverables. Overall, the results of this research indicate that the program is creating a positive impact, given its limited resources. Based on these result, the Halifax Dump and Run contributes towards greater campus and community sustainability, especially in its impact on waste diversion and charitable donations. In 2014, the Dump and Run diverted 9 tonnes of material from landfills, disposed of only 25 kilograms of material and raised \$5830.00 for local charity organizations.

Based on the findings, three recommendations have been made that could benefit the Dump and Run. First, expand the Halifax Dump and Run's services to the public by running the program for a longer period of time, as opposed to a one day event. Second, strengthen the program's social media presence and outreach. Third, improve internal program monitoring and evaluation so that measurable improvements can be made to the program in the future.

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## **1.0 INTRODUCTION**

Across Canada and the United States, various universities have begun implementing furniture-recycling programs on campus, getting these institutions nationally recognized as leaders in waste management and communal ownership. Although program models and structures differ by university, most maintain the common goals of diverting waste from landfills; saving money by increasing consumption of reused materials; and providing students and staff with an ethical means to access and dispose of unwanted furniture. The purpose of this research is to provide an in depth analysis of current furniture reuse opportunities offered at Dalhousie University. Specifically, this research project provides an analysis of the Halifax Dump and Run program and offers various recommendations on how this program can be improved. The implications of this report are for the university and student body to better understand the impacts of reuse programs and the feasibility to develop them.

### **1.1 Background**

Presented in the following background section are descriptions of several notable furniture-recycling programs at universities across Canada as well as one from the United States. These institutions were selected based on their comparable size to Dalhousie; their stated interest and commitment to campus sustainability; and the perceived success of their reuse programs. Listed below is a basic description of furniture recycling programs from other universities. The potential benefits of each furniture-recycling program are explained in terms of economic savings, waste diverted and social impacts. While both Dalhousie Surplus Material Program and the Halifax Dump and Run are included in the background, this paper will only provide an assessment of the later. This is because the Dump and Run is a student-centred program with a larger presence on campus, in contrast to the more internally focused Surplus Material Program.

#### **1.1.1 Current Programs at Other Universities**

##### ***University of British Columbia - “Reuse-it! UBC” Program***

Reuse-it! UBC, hosted by appropriately named iWasteNot Systems, is a program offered to University of British Columbia employees. It is designed to reduce the amount of reusable materials entering landfills by facilitating the exchange of furniture, audio-visual equipment, office supplies, etc. between university departments on campus (Reuse-It! UBC, n.d.b.). The program runs a virtual warehouse that gives users access to an online platform from which they can find, exchange, and offer items (Reuse-It! UBC, n.d.a). Listings are posted with detailed descriptions of the items as well as available photos and, if still active after 30 days, are subject to removal and donation to off-campus reuse organizations or charities (Reuse-It! UBC, n.d.b.). The goal of Reuse-it! UBS is as follows:

“ to build a culture of reuse at UBC via an online, easy-to-use platform, prevent reusable assets from entering the landfill and help the university to save money via reduced tipping fees and avoiding costs associated with new purchases” (Reuse-It! UBC, n.d.a.).

According to the Reuse-It! UBC website, registering with the program provides financial savings for both sides of the transaction. The department looking to purchase materials is likely to find goods at heavily discounted rates, because of the affordability of this business model (Reuse-It! UBC, n.d.b.). All moving and delivery of goods is organized through facilities management and UBC’s moving crew. While this service is beneficial, its capacity is limited by demand during the busy student move-in and move-out periods (Reuse-It! UBC, n.d.b.).

iWasteNot Systems, the organization that helped develop the Reuse-It! UBC program, also helps other organizations by “make[ing] and host[ing] Material Exchanges, Inventory Systems, Guides and Directories, and other online tools to help people and organizations reduce waste, and save money” (iWasteNot Systems, n.d.). iWasteNot Systems works within private and corporate sectors. It helps businesses, universities, municipalities, non-profits, and schools develop reuse programs and material exchange services to reduce waste, energy costs, and emissions associated with making and transporting products. Currently, iWasteNot Systems has clients in British Columbia, Ontario and across the United States (iWasteNot Systems, n.d.).

#### ***Ottawa University – “Furniture Reuse Program” (FRP)***

Ottawa University’s Furniture Reuse Program (FRP) grants the opportunity for Ottawa University students and staff to access used university furniture at a reduced cost. Forwarded by Ottawa University’s Office of Sustainability, the FRP evaluated the feasibility of saving or reusing furniture normally destined for the waste stream. The FRP requires little direct capital, operating with only two on-campus storage spaces and access to University transport trucks. This small amount of capital demonstrates a simple and linear system can still function effectively. Other necessary elements include an online inventory, a dedicated program coordinator and an amendment to municipal policy 65. The FRP produces a series of economic, environmental and social benefits. First, the FRP generated an estimated 1 million in savings during its introductory year and an estimated 2.4 million between 2009 and 2011 (Morin, 2011). The majority of economic incentives come from no longer needing to dispose of bulky furniture items, sparing the University labour costs, transport charges and disposal fees. The University found that proper disposal of furniture items required the rental of one \$120 twenty-yard waste bin, as well as additional charges of \$91 per tonne to be dropped off at the local landfill (Morin, 2011). Significant savings were generate by eliminating the purchase of expensive new furniture for departments or new buildings, since the university could instead draw

from its own resource of salvaged furniture. Second, between 2010 and 2011, a total of 26 Ottawa University departments reused furniture through the FRP, saving a collective \$430,000 (Morin, 2011). Furniture no longer suitable to be reused, due to general wear and tear, was commonly salvaged for scrap metals, textiles, and plastics for recycling. Ottawa University found that this option was less expensive than conventional disposal methods, and on average generated revenue of \$80 per tonne of scrap metal (Morin, 2011). Environmental benefits include reducing the waste stream while increasing inputs of the recycling system. The FRP allows greater use of durable goods, such as furniture, that otherwise would have been disposed of prematurely. A 2011 internal assessment conducted by the FRP revealed that 88.5 tonnes of material were diverted from the waste stream through reuse, recycling or donation (Morin, 2011). The university reports success of the FRP, and seeks to expand it through amelioration with the Crown Asset Distribution program, which will aid cost recovery on any publicly purchased equipment (Morin, 2011).

### ***Simon Fraser University “Materials Reuse & Recycling” Program***

Simon Fraser University is another British Columbia institution with a furniture-recycling program, called the Materials, Reuse and Recycling program. This program is driven by donation and accepts what are referred to as reusable furnishings (Simon Fraser University, 2014). Book shelves, desks, chairs and filing cabinets are commonly available items. Material that is not reusable due to damage are dismantled and supplied to recyclers, further decreasing Simon Fraser’s waste stream (Simon Fraser University, 2014). Notably, the Materials Reuse and Recycling program is off limits to students, and supplies furniture exclusively to Simon Fraser University departments. These furnishings are supplied for free; however, moving costs are still expected from the department responsible for the order. To reserve an item, a representative must contact the manned central storage desk, and book an appointment to physically view the inventory. Following a reservation, a service request must be submitted to Facilities Services before the item is transported to the department (Simon Fraser University, 2014). Even if students were granted access to the service, the process is overly complicated, time consuming and ultimately unsuitable for them. Little information is publicly available describing what impact this service has had on waste streams, or what economic benefits it has generated. An additional program exists at Simon Fraser University called the Classroom Used Furniture Recycling program. This initiative recognizes the surplus of classroom furniture that is being created from classroom renovation. Through this program, furniture is evaluated in terms of “functional criteria such as flexibility, aesthetics, compatibility etc...” (Simon Fraser University, 2014). Furniture that achieved the proper functional criteria is shipped back to Calstone Inc through their Take Back program, where it was disassembled, reused or recycled. It is unclear whether Calstone Inc covers transport costs of their Take Back program, or whether such costs are covered by

the university. While environmentally conscious, this model is more focused on University operations and recycling procedure than it is on waste divergence and student service.

### ***University of Minnesota - ReUse Program***

The University of Minnesota ReUse Program, run by Facilities Management, is a program that collects surplus materials from campus which it redistributes, resells, or recycles. This helps reduce the amount of waste entering landfills while providing the public and university departments with usable, low-cost materials (University of Minnesota, 2014a). The ReUse Program relieves 250 university buildings of unwanted surplus materials including office furniture, supplies, and equipment which it stores in a large warehouse for either redistribution to other university departments or retail to the general public on designated days during the week (University of Minnesota, 2014a). Various pickup locations around campus are identified so that items can easily be left for pickup and all sales are conducted on-site at the ReUse Warehouse (University of Minnesota, 2014b). According to the sales policies and procedures, the prices displayed are non-negotiable for the first 30 days after which they are then offered to the public. Deliveries can be made to university buildings for a small fee based on item weight and size (University of Minnesota, 2014b). According to the Facilities Management website, the University of Minnesota ReUse Program redistributes over \$200,000 worth of furniture and equipment interdepartmentally each year (University of Minnesota, 2014a).

The ReUse Program operates a virtual warehouse that is available to faculty, staff, and students at the University of Minnesota, where items can be posted, viewed and exchanged online (University of Minnesota Virtual Warehouse, n.d.). The virtual warehouse is affiliated with the Minnesota Materials Exchange and is a part of iWasteNot Systems (University of Minnesota Virtual Warehouse, n.d.). The ReUse Program also has a Facebook page where current items can be viewed with descriptions, and inquiries can be made regarding pricing (Facebook, 2015).

#### **1.1.2 Current Programs at Dalhousie**

##### ***Halifax Dump and Run***

The Halifax Dump and Run is a student-run event organized by Saint Mary's University Environmental Society (SMUES) and Dalhousie's Office of Sustainability. The Dump and Run collects unwanted items from students and the general public to be sold for discounted prices at an annual community-centred, indoor yard-sale (Halifax Dump and Run, 2013a). The stated goal of the Halifax Dump and Run is:

“to divert waste from local landfills by collecting items people no longer have use for and selling them (cheap!) at a gymnasium-sized indoor yard sale in order to raise



money for charitable organizations that support Halifax's social and environmental well-being" (Halifax Dump and Run, 2013a).

Prior to the event, which is held for one day only in late April, organizers offer a limited pick-up service around Halifax and the university residences (Dalhousie University, 2014). Items including clothing, electronics, furniture (excluding soft-covered furniture), cookware, books, toys, sporting equipment, household items, and non-perishable foods are all accepted as donations to the Dump and Run (Halifax Dump and Run, 2013b). The event, which is approaching its thirteenth year, is considered a success, combining community recycling, waste diversion and philanthropy. According to the Dump and Run website, it has managed to divert nearly 8 metric tons of potential waste from local landfills (Halifax Dump and Run, 2013a). Additionally, in 2013, the Halifax Dump and Run event raised over \$6000.00, which was donated to various local charities (Halifax Dump and Run, 2013a). While the available background research on the Dump and Run is limited, this research project will provide greater empirical data regarding this program.

### ***Dalhousie Surplus Materials Program***

In 1985 Dalhousie University introduced the Disposal of Surplus Equipment Policy that outlined the university's procedures for dealing with surplus equipment and materials (Dalhousie University, 2013). The policy suggests that, "financial and sustainability benefits will be delivered through procedures that maximize the opportunity for reuse of items and minimize the amount of materials that enters the waste stream" (Dalhousie University, n.d.a). This policy was most recently revised in 2013 and states that, "surplus University equipment, supplies and material(s) will be disposed of through processes administered by the University's Procurement Department" (Dalhousie University, 2013). The Procurement Department stresses that the any surplus materials shall be disposed in an environmentally sustainable manner, creating the Dalhousie Surplus Materials program.

This program operates through an online bidding system that allows individuals to view, bid and purchase items from the Dalhousie's *Surplus Materials – Current Items* database (Dalhousie University, n.d.b). This database includes details of each item as well as photos and descriptions for available items (Dalhousie University, n.d.b). Although priority is given to internal reuse of items by university departments, anyone is able to fill out the surplus bid form and win items (Dalhousie University, n.d.b). Completed bid forms are to be submitted by fax or email and successful bidders are contacted by the Procurement Department (Dalhousie University, n.d.e.). According to the Bid Terms and Conditions, successful bidders are responsible for the transportation of the items, which must be collected within 5 days of the closing date (Dalhousie University, n.d.e.). Items range from office

furniture such as desks, shelving units and to medical equipment and electronics (Dalhousie University, n.d.d.).

As identified above, several universities across Canada and the United States have implemented furniture-recycling programs that have produced varying degrees of environmental, economic, and social benefits. Many of the programs identified in the background section have successfully facilitated the removal of useable waste from traditional waste streams, resulting in significant financial savings by eliminating the need to purchase new items, while providing a valuable service to staff and students. Upon gathering background information on furniture-recycling programs at other universities, and a doing preliminary review of Dalhousie's reuse strategies and programs, it is the researchers' opinion that Dalhousie University could benefit from a more thorough review and evaluation of its current reuse programs to identify areas for improvement. By examining Dalhousie's current waste strategies, and drawing on the success achieved by programs at other universities, the research team hopes to offer constructive recommendations. These would act to improve Dalhousie's current tactics and programs for material reuse and furniture-recycling on campus. Specifically, this research will focus on the Halifax Dump and Run Program. This research will provide a comprehensive analysis of the Dump and Run Program and will offer recommendations for how it can be improved.

## **1.2 Motivations, Goals and Objectives**

As of 2014 Dalhousie had just over 18,500 students, 56% of whom are from other Canadian provinces and an additional 14% of whom are international students (Dalhousie University, n.d.f). Therefore, Dalhousie has approximately 70%, or roughly 13,000 students, moving to the province for university. It is common knowledge that the bulk of first year students moves into residence for their first year and then live in rental housing for the remainder of their degree. Throughout their degree a lot of students will move in and out of places, creating a dynamic market for furniture in Halifax. During this time students buy and sell new and used furniture through a variety of means. Currently students have various options as to how they can manage buying furniture and getting rid of their unwanted furniture. They can try and sell it through bargain-finder services such as Kijiji or Craigslist, they can donate it to local charities such as the Salvation Army, or they can throw it out through Halifax curb side programs. Halifax currently has a bulk garbage policy that allows households to throw out one piece of bulk waste, including furniture, per week (CBCL, 2011). This program makes throwing out the furniture a relatively easy option; especially when compared to the other options that can require extra cost or extra effort. Throwing out the furniture only requires putting said furniture on the curb. The researchers believe a service should be offered to students that would require a similar amount of effort as Halifax's curb side program. Such a program would collect furniture that could be

reused or recycled and diverted from landfills, saving thousands of tonnes<sup>1</sup> of either valuable furniture or valuable scrap materials from being thrown out as waste. This belief led the researchers to the aforementioned Halifax Dump and Run.

After reviewing Dalhousie's current furniture recycling program, it is the researcher's belief that an in-depth analyses of the Halifax Dump and Run will provide greater understanding of what maximizes the impact of a furniture-recycling program. Furthermore, research surrounding other furniture-recycling programs will help guide this understand. These insights could then help Dalhousie invest in an effective and efficient furniture-recycling program that would prevent furniture from needlessly being thrown out. The sooner that Dalhousie achieves an effective furniture-cycling program, the sooner Dalhousie will start to produce positive environmental and economic impacts, minimizing the amount of furniture wasted.

### **1.3 Purpose of Research**

Dalhousie already has two services offered to students and faculty to address the problem of furniture waste. However, it is the researchers' belief that these services are underserving Dalhousie and its students, and that more furniture could be diverted from Nova Scotia landfills. Therefore, the researchers are proposing to do an analysis of one of the two services currently offered by Dalhousie, the Halifax Dump and Run. The analysis of the Dump and Run will cover various factors; how much money it is saving the university and its students annually, how much waste is being diverted from landfills annually, and how many students are benefitting from this service annually. An in-depth explanation of the analysis is provided in the methods section below. The analysis will be used to make recommendations for improving the Dump and Run and ultimately Dalhousie's furniture recycling and reuse programs in an effort to further improve sustainability on campus.

## **2.0 METHODS**

### **2.1 Description of Study**

This study analysed the Dump and Run program by collecting information based on sustainability related criteria stemming from the Three Pillars of Sustainability (Environmental Protection Agency, n.d.). The researchers organized the study into three broad categories of data to be collected and analysed. Guided directly by the Pillars of Sustainability, these broad categories included: Environmental, Social, and Economic. A set of 15 questions that coincided with each of the broad categories were developed by the research team and subsequently answered through a phone

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<sup>1</sup> Halifax Resource Recovery Board puts out an annual report breaking down the waste entering Nova Scotia Landfills. In the most recent report made available in April of 2012, a total 2180 tonnes of bulk waste was put into Nova Scotia Landfills. Bulky items is a broad term for furniture and includes laminated and engineered wood, mattresses, box springs, upholstery, and other non plastic furniture items (CBCL, 2011)

interview with the lead coordinator of the 2014 Dump and Run program (Appendix B). The resulting evaluation determined how much waste the Halifax Dump and Run diverted from landfills in 2014. Numbers regarding the tonnage accepted, recycled, sold, thrown out, and donated by the Dump and Run were included in the environmental category. The environmental category also observed the potential climate impact of the Halifax Dump and Run program during its waste collection. This included questions related to transportation, such as kilometres driven for waste collection and pick-up by Halifax Dump and Run. To evaluate the Halifax Dump and Run's effectiveness, social criteria were assessed. These criteria questioned the number of participants – categorized into donors, buyers, and students – as well as the time period in which the program operates, and social media presence. To evaluate the program's social impacts, questions looked at the amount of charitable donations, educational material, and development of human capabilities, such as student and non-student volunteers. To evaluate the Halifax Dump and Run's economic revenue, all costs of running the program were compiled. These included avoided alternative collection costs, avoided alternative disposal costs, amount donated to charities, and revenue.

## **2.2 Procedure**

To collect data for all 15 questions, based upon the three broad categories, two data collection methods were used (Appendix B). An interview with the Halifax Dump Run program coordinator was used to collect factual data about the program and a Klout score was used to collect data on social media presence surrounding the program. Both methods are presented below.

### **Interview**

Due to the factual nature of the data being collected, and the limited availability of this data to the public, given data collected for this study is not posted online, it was decided that data would be collected through a qualitative research interview. An interview was used, rather than other data collection methods, because its protocol provides opportunities for the researchers to ask follow-up questions that were not listed in the initial criteria but that may be useful to analyse this program. Since information needed for analysis was purely objective, a one-hour, semi-structured phone interview was conducted. The interview was carried out by two researchers and was conducted with the Halifax Dump and Run program coordinator responsible for all relevant data in 2014. Before the interview, the interviewee was contacted and a date/time was set for the interview (Appendix A). The interviewee was given a broad idea of what questions would be asked days before the interview to ensure that the interviewee could prepare the needed information. In order to maintain consistency, one researcher asked the questions and conversed with the interviewee while the other researcher was responsible for taking notes and recording the interviewee's response on a pre-made excel spread sheet.

In total, 15 questions were asked to the program coordinator (Appendix B). During the interview, additional questions were asked based on the interviewee's response to assist further analysis due to the incomplete information provided by the interviewee. The answers were then stored in the excel spread sheet for subsequent data analysis.

### **Klout Score**

Quantifying the influence that an organization has on social media is challenging due to the broad range of social media platforms and their complex integration. Therefore, a tool known as Klout was used to determine the Dump and Run's social media influence. A Klout score is a number between 1 and 100 used to measure the influence an organization has over social media. Social media influence is the ability of one to encouragement the action of an individual and intentionally spread information (Klout, 2014). The Klout score uses a proprietary algorithm that monitors a potential of 400 signals across 8 different social media networks. Examples of signals include "re-tweets," "likes," "follows", and "mentions" (Klout, 2014). It also takes into account the influence of those who are interacting with the organization over social media. The Klout score is one of the many tools available which attempt to provide a single number to represent social media presence. To provide context, the average Klout score is 40, while Barack Obama has a score of 99 (Klout, 2014). In addition to the Klout score, a table of some of the Dump and Run's quantifiable social media numbers was compiled (see Table 2).

### **Analysis of answers from the interview**

The Dump and Run coordinator did not record tonnage of material collected, sold or donated to charities. As a result, questions had to be reframed in order to obtain the necessary information. Researchers asked how many rooms were filled with furniture and how many rooms were filled with other items. Researchers then asked the composition of furniture in the furniture rooms and composition of items in the item rooms. Lastly, researchers asked how furniture was organized in each room and the capacity of each room. With this information figures for the tonnage could be calculated. To obtain figures for tonnage, square footage of rooms was calculated. Dalhousie facilities management requires 20.45 ft<sup>2</sup> per student in loose table classrooms (Facilities Management, 1997). The total storage space used by the Dump and run was calculated by multiplying this figure by the number of students, and by the number of classrooms used for storage as seen in Appendix C.

Given that furniture and miscellaneous items have different weights and footprints, their storage has to be calculated separately. First, the tonnage of furniture collected was calculated and the standard weight and size of each type of furniture was recorded. Given the variance between different types of furniture the number of each piece of furniture would have to be calculated. To do this, the

total space used to store furniture – three classrooms with a 40-50 student capacity – was divided by the sum of all furniture footprints. This revealed the optimal number of each type of furniture that could be stored in the available storage space. This number was then multiplied by the weight of each item, and summed. The figure arrived at represents the tonnage of furniture optimized to fit in the furniture storage rooms.

A similar calculation was provided for miscellaneous items. The square footage used to store miscellaneous items was calculated. The interview revealed that the majority of miscellaneous items were stored in large plastic bags on the floor of rooms. The composition of bags consisted of shirts, towels, bedding, books, small appliances and small cookware. In order to calculate tonnage, a sample bag consisting of representational proportions of each of these items was created. The size and weight of this sample bag was measured and recorded. This footprint was divided by total miscellaneous item storage space, revealing the number of sample bags collected. The number of sample bags collected was multiplied by the weight of sample bags in order to record overall tonnage of miscellaneous items.

Finally, tonnage of furniture and tonnage of miscellaneous items was summed, revealing the total tonnage of material collected by the dump and run in 2014. We based our estimates of tonnage sold and tonnage donated to charity from this figure and interview questions.

### **2.3 Reliability, Validity and Trustworthiness**

This study focused on one program, the Halifax Dump and Run, over a one-year period and was based on an interview with the 2014 Halifax Dump and Run coordinator who had the best knowledge of what occurred that year for the program. The responses gathered from the interview process were then analysed based on information from the Dalhousie Facility Management Room Capacity Index and assumptions based on the responses. Although the study did not have a large sample size and the interview responses were not the most accurate, efforts were still made to maintain reliability, validity and trustworthiness throughout the research.

The reliability of this study is based on its methods ability to consistently determine results for the Halifax Dump and Run. This study interviewed only one individual with the most expertise on the subject, thus limiting variation from multiple, less experienced perspectives. The calculations made in this research utilised assumptions on room size and item weight. This produced standardized averages that could be reused in subsequent studies; although, results may vary slightly depending on the interruption of the interview responses. The primary issues of reliability were human error and the annual variation. Since the interview was conducted almost a year after the 2014 Halifax Dump and Run event, the recollection of answers that were not recorded may vary depending on the interviewee.

Additionally the program has new coordinators and volunteers every year so detailing of the records and the effectiveness of the program will vary, reducing repeatability.

The efforts to insure validity began with the interview selection. Although multiple people involved with the program were contacted, the individual interviewed had been very active in the program and had the financial records for that year. This allowed for the results gathered from the interview to be the most valid.

To produce trustworthy results, dependability, credibility, and conformability were all taken into consideration. Throughout the evaluation, methods were based on the previous sustainability studies and all steps have been recorded and detailed to maintain dependability. For credibility the focus has been on the interviewee, who throughout the interview had the opportunity to explain answers and give perspective so the answers were not misconstrued. Conformability was maintained by carrying the confidence given in each interview answer over to the end results presented, for example, results calculated based on interview answers given in number of rooms were not presented as overly accurate.

## **2.4 Limitations and Delimitations**

The limitations surrounding this research method primarily stemmed from contextual factors involved in the interview process.

First, due to the time frame in which the interview was conducted, necessary data had to be collected a year after Dump and Run event occurred. This impacted the recollection of the interviewee, limiting the confidence of their estimations. The interviewee would have been more likely to make improper estimations – either higher or lower than the reality – resulting in incorrect conclusions of this paper.

Second, assumptions used to calculate tonnage might have led to incorrect results. Since the interviewee could only estimate the amount of furniture collected through the number and capacity of rooms filled, it was up to the research team to conduct proper weight calculations. If the assortment of items was not a representational weight, or the square footage did not characterize an appropriate sample of items, then the resulting calculation of tonnage collected would not reflect reality of the Dump and Run.

The main delimitations for this research were the program selection and the year of focus. There are two programs at Dalhousie doing furniture recycling, the Halifax Dump and Run and the Dalhousie Surplus Materials Program. The Halifax Dump and Run is more student-focused and

socially oriented, making it a better fit for this area of interest. Furthermore, although this program has run for many years, only the 2014 year was analysed. This is because the chances of getting accurate data decreases with each consecutive year, as it relies on recollection of events further in the past. This would not have been the case if data from the Dump and Run was more readily recorded. The research focused only on the direct activities of the program, omitting the perspective of volunteers and participants. This was in order to best address the goals of the research, and avoid subjective possibly conflicting results.

### 3.0 RESULTS

The key results of this study revealed approximate values for each of the 15 questions integral to supporting the hypothesis. The following section will objectively explore these results in order of environmental, social and economic criteria as seen in Table 1.

The initial questions for environmental criteria could not be answered by the interviewee. Instead tonnage figures were calculated from the number of rooms filled with furniture or miscellaneous items; composition of furniture or miscellaneous items and student capacity of rooms filled. These values allowed researchers to estimate the tonnage accepted by the Dump and Run for 2014, revealing the key finding of 9.9 tonnes of material accepted. Figures for the tonnage sold and the tonnage donated to charity were not recorded by the interviewee. The interviewee approximated the tonnage sold as three quarters of material collected, and tonnage donated as one quarter of material collected. This allowed the approximation of 7.42 tonnes and 2.45 tonnes of material sold and donated respectively. The tonnage thrown out was only 22.68 Kg while the tonnage recycled – consisting entirely of 16 tube TVs – equated to 0.87 tonnes. Distance driven by the collection truck was not recorded by the interviewee. Instead, gas expenditure and model of truck were used to calculate the 228.77 Km driven by the collection

Table 1: Criteria Results

Criteria	Results
<b>Environmental</b>	
Tonnage Accepted	9.9 t
Tonnage Sold	7.42 t
Tonnage Recycled	0.87 t
Tonnage Thrown out	22.68 Kg
Kilometers Driven for Collection	228.77 Km
Tonnage Donated to Charity	2.45 t
<b>Social</b>	
Donors	361 Individual
Students	200 Individual
Buyers	400 Individual
Charitable Donations	2,452 t
Availability of Program	30 Days
Social Media Evaluation*	(See table 2)
Educational Material*	0 opportunity
Development of Human Capabilities*	18 volunteers
Development of Student Capabilities*	15 volunteers
<b>Economic</b>	
All Costs of Running Dump and Run	\$2596.41
Avoided alternative collection costs*	\$1056.00
Avoided alternative disposal costs*	\$1576.50
Amount Donated to charities	\$5830.00
Revenue	\$8442.00



truck.

The social criteria consisted of questions relating to the Dump and Run's impact on people and the community such as donors used, charitable donations, social media outreach and development of human capabilities. Information needed for this section was readily available to the interviewee. Key results included 361 people donating to the Dump and Run; approximately 400 buyers at the event and involved 18 volunteers, 15 of which were student volunteers. Social media results are found in Table 2.

The social media evaluation revealed a combined Facebook and Twitter Klout score of 20. Additionally, 275 people "like" the Facebook page and 284 people indicated their attendance to the 2014 Dump and Run digitally over Facebook. There were no forms of educational material at the event. The social criteria excluded financial impacts of the Dump and Run, as these would be included in the following economic criteria.

Table 2: Social Media Results

<b>Metric</b>	<b>Result</b>
<b>Klout Score</b>	20
<b>Facebook Page Likes</b>	257
<b>Number of Facebook RSVPs for 2014 Dump and Run</b>	284
<b>Tweets</b>	72
<b>Twitter Followers</b>	93

The economic criteria of this research project included operational costs as well as costs to the city and community. Operational costs and revenues were recorded by the Dump and Run, making them readily available to the interviewee. It cost \$2596.41 to operate the 2014 Dump and Run where \$8442.00 revenue was collected, resulting in \$5830.00 donated to charities. The waste diversion costs saved by the Dump and Run for the city totalled \$1576.50 in disposal costs and an additional \$1056.00 in collection costs.

## **4.0 DISCUSSION**

### **4.1 Summary of Research Question and Purpose**

The main objective of this study was to gain insight into what is being done by Dalhousie University to address the problem of potentially usable furniture being sent to landfills as waste. It was found that the problem of furniture waste on campus stems from the seasonal and intermittent living arrangements of university students. The seasonality of student life creates a situation in which a large amount of usable furniture is no longer needed, leaving students to dispose of furniture in a quick and easy manner. Disposal methods commonly include trying to sell items on websites such as

Kijiji Craigslist, or leaving items on the curb to be picked up and disposed of as bulk waste, ultimately ending up in landfills. Having identified this as an issue, the purpose of this study was to evaluate the effectiveness of current furniture recycling programs in place at Dalhousie, namely the Halifax Dump and Run Program. As mentioned in previous sections, although Dalhousie has two main programs in place to facilitate furniture recycling, it was of the researcher's opinions that the Dump and Run was more relevant and amenable to evaluation. This was due to its larger presence on campus; its greater accessibility to students and the public; and its perceived potential for substantial improvements. The Dump and Run was analysed and evaluated in terms of its effectiveness in promoting sustainability. This was based on criteria stemming from the three pillars of sustainability – environmental, economic, and social indicators – and recommendations based on the results that were analysed. The final purpose of this study was to offer constructive recommendations on how the Dump and Run Program could be improved, and what steps could be taken to increase its impact and future success.

#### **4.2 Significant Findings**

Upon completion of the Halifax Dump and Run analysis, several significant findings arose. This study found that the 2014 Dump and Run program was successful in diverting usable material and furniture from landfills. It was found that by the end of the 2014 program, approximately 25kg of material was wasted to the landfill. Nevertheless, nearly 9 tonnes of material was diverted from local landfills. Additionally, it was found that approximately 2.45 tonnes of material and \$5830.00 was donated to various charities. These findings are especially significant given that this is only a one-day, annual event with minimal social media presence. Furthermore, given that in 2014 the Dump and Run program only had a total of 18 volunteers, the tonnage of material the program successfully diverted is impressive to the research team.

#### **4.3 Consideration of the findings in light of existing research studies**

When considering the findings of this study, in light of the larger body of work surrounding University furniture recycling programs, it is clear that the Dump and Run could improve in some areas. Overall, given its current resources, it has been relatively successful in diverting materials from landfills by facilitating the recycling and reuse of items. In general, based on of the significant body of background research conducted for this study, other Universities with furniture reuse and recycling programs differ from the Dump and Run in a few notable ways. Specifically, other Universities such as the University of Ottawa or University of Minnesota, operate their furniture recycling programs year round through of a central storage facility. The Dump and Run is held out of Studley Gym on Dalhousie Campus which is rented out for the one-day event. Compared to other Universities the Dump and Run Program does not possess or have access to a permanent storage facility which limits its ability to operate year round. Additionally, many of the other universities utilize online platforms

which allow students, and in some case the public, to digitally view and evaluate items that are currently available for purchase. Given that the Dump and Run is only held once a year, and subsequently does not have a permanent storage facility, the program lacks any sort of online platform where sale items can be displayed. In essence, the Dump and Run is held in the style of a large garage sale, as opposed to a permanent service on Campus, with no online means to facilitate a transaction.

In terms of tonnage diverted, it is difficult to compare other furniture recycling programs to the Dump and Run. This is due to the large diversity in program sizes, models, funds, etc. However, it is worth noting that in 2011 the University of Ottawa conducted an internal assessment of its furniture reuse and recycling program, concluding that nearly 88.5 tonnes of material was diverted (Morin, 2011). Although this figure cannot be directly compared to the Dump and Run, it suggests that other programs and models, if implemented, have the potential to divert significantly more materials than is currently being diverted by the Dump and Run. It must be noted that the success of implementing such a program would be dependent on funding and support.

Finally, in light of research surrounding university furniture recycling programs, it appears that the Dump and Run does not have a system of internal evaluation to allow for continual program assessment. As evidenced by the cases presented in the background section, internal program evaluation is an essential component for identifying where improvements can be made. Internal assessment also allows for quantification of impacts the program has in terms of sustainability benefits. In essence, the research provided in this report filled a gap in terms of program analysis and evaluation for the Dump and Run and was thus able to provide recommendations for how the program can be improved.

#### **4.4 Implications of Research**

This study has shown that the Halifax Dump and Run Program is a positive event that effectively diverts reusable materials from landfills. Through an in-depth analysis, this study has provided a clear set of recommendations for how the Dump and Run can be improved and made even more effective and impactful. The Dump and Run Program is valuable to the Dalhousie campus community as well as to the larger surrounding community as it not only provides people with low cost furniture and materials but donates funds to various charitable organizations as well. This program has the potential to be even more effective if the recommendation we have outlined (see below) are taken into consideration and could position Dalhousie and the Dump and Run as leaders in materials recycling, waste diversion, and community building.

## **5.0 RECCOMENDATIONS AND CONCLUSION**

### **5.1 Recommendations**

Through researching what other universities currently offer for furniture recycling programs and completing an analysis for Dalhousie's current practices, the researchers came up with three recommendations for Halifax Dump and Run program: 1) increase monitoring and evaluation, 2) grow the Dump and Run's social media presence, and 3) increase the availability of the program.

After interviewing the program coordinator it became evident that there was a not a focus on monitoring what surplus material came in and out of the Dump and Run. As seen in the results and methods sections assumptions were made to calculate tonnage values. As a result the validity and reliability of the data extracted from the interview is low. Therefore, the first recommendation is for increased monitoring and evaluation of the Dump and Run. Increased monitoring and evaluation would play a key role in the growth and continued success of the Dump and Run. With better qualitative data on the furniture and materials moving through the event, the Dump and Run could more accurately assess their sustainability benefits. Internal monitoring would allow for the recording of clear numbers around how much tonnage of furniture is being diverted, and how much money is saved. These figures could be used in proposals and requests for more funding and resources. Before the Dump and Run can make claims about the beneficial impacts of the event, it needs to measure exactly how much impact it is having through increased monitoring and evaluating.

The second recommendation is to increase the Dump and Run's social media presence. This includes increased engagement through social media, such as Twitter and Facebook, and getting greater coverage in Dalhousie's news outlets such as the weekly newsletter emails. The poor Klout score received by the Dump and Run suggests that the Dump and Run could use social media to spread awareness about the event, and about the positive impact they are having. The Dump and Run could utilize social media to ensure students are more informed about the negative impacts of throwing out furniture and reusable materials, and make them aware that there is a simple alternative.

The third recommendation for the Dump and Run is for them to increase the duration of their services. Currently the event is only held once a year in the month of May. When the winter semester ends in April, students start to move back home or move away for various reasons. Therefore, a lot of students are not able to attend the event. Previous Dump and Runs have proved that there is a market for gently used furniture in Halifax. By offering the program more times throughout the year the Dump and Run could test if adding times for ideal for students could grow the amount of donations being made and people attending the event. Increasing the amount of times it is offered is the next step in growing the impact of event and the amount of furniture diverted from landfills. Additionally it

would help progress towards the scale of some of the larger programs seen at other universities that operate year round.

Fourth, future work that could be done with regard to the Halifax Dump and Run would be to conduct an economic cost benefit analysis of the event if organizers paid for a storage space near campus. When reviewing similar furniture recycling programs at other universities, a common denominator was a large space to store the furniture. Currently the program temporarily stores furniture in the Studley Gym for the short amount of time between pickup dates and the actual event. An economics analysis could look at the financial viability of the program if they paid for a storage space on campus.

## **5.2 Conclusion**

From starting with a desire to understand the furniture landscape in Halifax, to analysing the Dump and Run, the researchers were able gain greater understanding of Halifax's dynamic furniture market. Analysing the Halifax Dump and Run provided insight into furniture recycling in Halifax and has demonstrated that the program is running successfully and is having a net positive impact on sustainability. It has also shown there is a market for used furniture in Halifax and re-emphasized the importance of proper monitoring and evaluation for these types of events. It is hoped that this information will provide a strong enough message to re-evaluate the resources invested in the Dump and Run, and consider expanding its services. The research group also learnt a valuable lesson with respect to unwanted furniture, summed up in the quote below:

*“Don't be shelve-ish with your furniture, be chair-a-table”*

*-The Research Team*

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APPENDIX A – DRAFT EMAIL TO BE SENT TO PROGRAM  
MANAGERS

Dear \_\_\_\_\_,

I am student at Dalhousie University doing a study on furniture recycling programs for the course "Campus as a Living Laboratory". Our group is interested in interviewing you to discuss (program name) and your experiences in managing the program. The interview can be timed to best suit your schedule and should take no longer then 30 minutes, but would need to be conducted by March 13<sup>th</sup>. If you would like to know more about the interview or our project we can be reached at this email. Additional information about the course can be obtained by contacting our professor, Tarah Wright at: [tarah.wright@dal.ca](mailto:tarah.wright@dal.ca) or from the course description at: <http://registrar.dal.ca/calendar/class.php?subj=ENVS&num=3502>.

If you would be interested in participating in our study please reply and provide the information for your preferred method of contact along with what times and days work best for you.

Thank you for your time,

\_\_\_\_\_



## APPENDIX B – INTERVIEW QUESTIONS

### **Environment**

How many tonnes of material did the Dump and Run accept in 2014?

How many tonnes of material did the Dump and Run sell in 2014?

How many tonnes of material did the Dump and Run recycle in 2014?

How many tonnes of material did the Dump and Run throw away in 2014?

How much was spent on gas for trucks in 2014? What model of trucks did you use?

### **Social**

How many individuals donate to the dump and run in 2014, whether on campus or not on campus?

How many students use the service in your year?

How many individuals purchase items from the Dump and Run in 2014?

How many items are donated to charitable organizations following the end of the Dump and Run season, in 2014?

How many months does the Dump and Run operate, either selling or collecting items?

How many sources of educational material does the Dump and Run provide regarding the environmental/sociological issues related to waste disposal?

How many people volunteered for the Dump and Run last season? How many of these volunteers are students?

### **Economic**

In dollars, how much did the Dump and Run spend in 2014?

In dollars, how much money did the Dump and Run donate to charities in 2014, not including the value of items donated?

How much revenue was generated by the Dump and Run in 2014?

## APPENDIX C – TONNAGE CALCULATIONS

### Tonnage of Furniture

**Loose table classroom:** 20.45 ft<sup>2</sup>/student

Classroom (45 students): 20.45 ft<sup>2</sup> x 45 = 920.25 ft<sup>2</sup> [this could be a 40'x23' classroom, sound realistic?]

Classrooms (Furniture): 920.25 ft<sup>2</sup> x 3 = 2760.75 ft<sup>2</sup>

Classroom if stacked 5' high (Furniture): 2760.75 ft<sup>2</sup> x 5 ft. = 13803.75 ft<sup>3</sup>

**Computer chair:** <http://www.ikea.com/ca/en/catalog/products/30212487/>

Depth: 2.08' Width: 1.96' Height: 2.91' Weight: 14Kg

2.08' x 1.96' = 4 ft<sup>2</sup>

14kg x 41 = 574 Kg

2.08' x 1.96' x 2.91' = 12 ft<sup>3</sup>

14Kg x 105 = 1470 Kg

**Bedframe:** <http://www.ikea.com/ca/en/catalog/products/S79931160/>

Length: 6.5' Width: 4.9' Height: 1.25' Weight 39.9Kg.

6.5' x 4.9' = 31.85 ft<sup>2</sup>

39.9Kg x 41 = 1635.9 Kg

6.5' x 4.9' x 1.25' = 39.8 ft<sup>3</sup>

39.9Kg x 105 = 4189.5 Kg

**60-inch Desk:** <http://www.amazon.com/Boss-60-Inch-Width-30-Inch-Cherry/dp/B002FL3MHK>

Product Dimensions: Height: 2.5' Length: 5' Width: 2.4' inches 52.6Kg.

2.4' x 5' = 12 ft<sup>2</sup>

52.6Kg x 41 = 2156.6 Kg

2.5'x5'x2.4' = 30 ft<sup>3</sup>

52.6Kg x 105 = 5523Kg

**Love Seat:** <http://www.ikea.com/us/en/catalog/products/10261638/>

Product dimensions: Depth: 2.75' Height: 2.58' Width: 4.83' Weight: 50.8Kg

2.58' x 4.83' = 12.46 ft<sup>2</sup>

50.8Kg x 41 = 2082.8 Kg

2.75'x 2.58' x 4.83' = 34.3 ft<sup>3</sup>

50.8Kg x 105 = 5334 Kg

**Student desk:** <http://www.ikea.com/us/en/catalog/products/40244850/>

Product Dimensions: Length: 3.9' Width: 1.6' Height: 2.4' Weight 24.9Kg

3.9' x 1.6' = 6.24 ft<sup>2</sup>

24.9Kg x 41 = 1020 Kg

3.9'x1.6'x2.4' = 15 ft<sup>3</sup>

24.9Kg x 105 = 2583 Kg

### **Equal amount of each furniture type:**

Total room space / Sum of furniture footprint = Average number of items

2760.75 ft<sup>2</sup> / (4 ft<sup>2</sup> + 31.85 ft<sup>2</sup> + 12 ft<sup>2</sup> + 12.46 ft<sup>2</sup> + 6.24 ft<sup>2</sup>) = 41 pieces of furniture

Total room volume (if stacked)/Sum of furniture volume = Average number of items

13803.75 ft<sup>3</sup> / (12 ft<sup>3</sup> + 39.8 ft<sup>3</sup> + 30 ft<sup>3</sup> + 34.3 ft<sup>3</sup> + 15 ft<sup>3</sup>) = 105 items

### **Total furniture Tonnage:**

574 Kg + 1635.9 Kg + 2156.6 Kg + 2082.8 Kg + 1020.9 Kg = 7470 Kg (7.47 Metric Tonnes)

### **Total furniture Tonnage (stacked):**

1470 Kg + 4189.5 Kg + 5523 Kg + 5334 Kg + 2583 Kg = 19099.5 Kg (19.099 Metric Tonnes)

### **Tonnage of Miscellaneous Items**

Classrooms (Misc Items): 920.25 ft<sup>2</sup> x 2 = 1840.5 ft<sup>2</sup>

**Sample Bag of Items:**

- Black Garbage bag
- 4 shirts (cotton)
- 5 towels (cotton)
- 1 blanket (cotton)
- 1 bedsheet (cotton)
- 3 textbooks
- 1 small appliance (blender)
- 1 small pot
- 1 small pan

Total weight of Sample bag: 11.88 Kg

Footprint of Sample Bag: Length: 3' Width: 3' Height: 4'

$$3' \times 3' = 9 \text{ ft}^2$$

$$3' \times 3' \times 4' = 36 \text{ ft}^3$$

**Number of sample bags in Misc Rooms:**

$$1840.5 \text{ ft}^2 / 9 \text{ ft}^2 = 204 \text{ Misc Bags}$$

**Total weight of miscellaneous items:**

$$204 \times 11.8 \text{ Kg} = 2429.46 \text{ Kg (2.429 Metric Tonnes)}$$

**Total tonnage of items from the Dump and Run:**

$$2.429 \text{ Metric Tonnes} + 7.47 \text{ Metric Tonnes} = 9.899 \text{ Metric Tonnes}$$