

LFS 350 Community-Based Experiential Learning

# City of Vancouver - Put Waste in its Place: The Zero Waste Station Challenge

## Final Community Project Report

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**By**

Emma Clark, Linda Phan, Ying Jean Tan, Kayla Hei Tung Tsang, Joshua Sungkarto, and Cheryl Xiaoshuo Zhang

**In collaboration with**



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## Introduction

Our community-based experiential learning project continues the ongoing “Put Waste in its Place” initiative implemented by the City of Vancouver, CityStudio and UBC. CityStudio is an “innovation hub” for City of Vancouver which facilitates community-based projects by students, staff and community members (CityStudio, 2016). The City of Vancouver’s 2020 “zero waste” project targets a 50% reduction in landfill solid waste from 2008 levels, in which 23% decrease has been achieved as of 2014 through efforts such as organic waste ban, expanding the range of recyclable materials, and implementing compost programs (City of Vancouver, 2016). Together, these organizations and our team have led a project aiming to evaluate the effectiveness of newly designed, additional waste station signages in improving the accuracy of waste diversion at Killarney Community Centre (KCC). Waste diversion constitutes reducing the amount of waste ending in landfill by “diverting” it to recycling and organic waste instead. KCC is located near Rupert and East 29th Ave, and offers a fitness centre, pool, and rink. This location is an important setting in terms of waste diversion, as it attracts a wide variety of people from different age groups, who bring or buy food, thus generating a large amount of waste.

This project is not only significant to the “zero-waste” project, but also addresses the global waste management crisis. Landfill incinerator emits greenhouse gases (GHG), producing “harmful, climate-altering impacts” (City of Vancouver, 2016). In a broader context, landfill gas emissions were the single greatest source of solid waste emissions in Canada in 2008 (Mohareb et al. 2008). A shift towards zero waste is imperative in reducing GHG emissions, saving money and resources, and inspiring collective action towards a greener community (City of Vancouver, 2016). Our research provides data to CityStudio and the City of Vancouver on the effectiveness of the additional waste decals on waste-sorting behaviours, that could be applied to all community centres across Vancouver. It also contributes to filling the gap in academic research on the topic of zero-waste

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initiatives, specifically waste signage, in community centre settings. In doing this, we aim to facilitate movement towards a greener, zero waste Vancouver which, as stated above, will have exponentially positive impacts on a global scale.

Our project objective is to determine whether additional waste decals should be implemented across all community centres in Vancouver as a method to improve waste sorting behaviours. In doing this project, we aimed to answer our inquiry question: will the additional waste decals improve the accuracy of waste diversion in KCC?

## **Methods**

### **Data Collection Approach**

Quantitative data was collected through naturalistic observations on sorting behaviours. Using a naturalistic approach was important in reducing possible bias that may have been caused if the participants knew their waste behaviours were being recorded. We also gathered qualitative data through informal interviews to determine immediate feedback of the additional decals. Data collection took place for 1 hour from 5-6pm on three separate Fridays. We decided on this time frame due to Friday evenings being relatively busy, with after-school children's programs, families using the pool, and teenagers visiting the centre after school. During the hour, we recorded whether people (categorized as kids, teens or adults) look at waste signage or not, and if they sort their waste correctly, partially correctly, or not at all (refer to data collection Tables 1a-3b in Appendix). We also took note on the waste bin locations and specific types of waste being sorted incorrectly. On our first visit, we collected data with just the previously existing signage. One week later, we applied the additional waste decals to the body of the waste bins and took observations. On our final, third visit, we took observations after the decals had been present for 2 weeks.

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## **Analysis**

We analyzed our data tables by comparing the amounts of people who looked at the additional waste decals and their waste-sorting accuracy before and after the additional waste decals were added. We combined “sorted partially correctly” and “sorted incorrectly” categories in order to calculate more relevant statistics. We also calculated the percent of people who looked at waste signage (old or new) and ended up sorting their waste correctly (Table 4a-4b in Appendix). Finally, we analyzed interviews from each visit to determine possible explanations behind our quantitative data (Table 4a-4b in Appendix).

## **Ethical Considerations**

Each member of our group obtained a TCPS-2 certificate for Ethical Research before conducting our data collection. A consent form was given to every participant before the informal interview started. We also utilized an Asset-Based Community Development approach in an attempt to improve the community centre’s existing assets instead of pointing out missing or ineffective elements (Mathie and Cunningham, 2003). The above ethical considerations enabled us to construct a thoughtful and appropriate model, keeping ethics standards and participant well being in mind.

## **Results**

There was a 9% increase in accuracy of waste diversion after the addition of the new decals (Table 4a-4b in Appendix). Also, 77% of the patrons who looked at the signages, old or new, ended up sorting their waste correctly (Table 4a-4b in Appendix). We found no significant difference among age groups on the accuracy of waste diversion. As for the informal interviews, most of the patrons supported additional waste decals to promote accurate waste diversion, but many had suggestions to adjust the size and the brightness of the images, get rid of repeated

items, and to introduce greater diversity of items (Site Visit Informal Interview Result in Appendix).



Figure 1: Major results obtained from the three site visits

## Discussion

Through diverting waste from landfills, our project has the potential to reduce greenhouse gas emissions that contribute to the progression of global warming (Mohareb et al., 2008), preserve economic resources (City of Vancouver, 2016), and create a cultural shift towards sustainability.



Figure 2: Benefits of waste management initiatives

The 9% increase in proper waste sorting after the new decals were added indicates that the decals may have improved patrons' sorting behaviours at KCC. This relates to our project objective because it shows that the implementation of additional decals may be an effective method in improving citywide waste sorting behaviours. Also, our results suggest the importance of having signs in general, because the

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majority (77%) of patrons who looked at signage ended up sorting their waste correctly. Contrastingly, this means that 23% of patrons who looked at signage end up sorting incorrectly. This shows that improvements can still be made to the decals, in which many comments received during our qualitative interviews revealed (Site Visit Informal Interview Result in Appendix). Mathie and Cunningham (2003) believe that Asset-Based Community Development can be an alternative approach to the usual needs-based approach that focuses on the problems of a community. Using this approach helped us to focus on strengths, thus engaging and empowering the community to make changes and become aware of their capabilities (Mathie and Cunningham, 2003). Therefore, instead of seeing the uncertainty as a negative, we believe that the result shows an exciting potential for further initiatives to improve the waste station decal. Our project shows that we, as a community, have the potential to contribute to the larger issue of food justice and food security on a local and eventually, global scale.

### **Limitations**

One limitation to our project was that our site visits spanned just under a month, and each was limited to around 1.5 hours. The short time span limits the amount of qualitative interviews obtained, the representativeness of the sample, and created a possibility that the results were simply caused by chance. It was challenging to determine whether patrons consciously noticed the decals and the types of waste they threw away. Furthermore, one waste station did not have a "Food Scraps" bin, which may have influenced people to put their food waste into the "Landfill" bin as they have no other option. To overcome these limitations, we believe that data collection should be done on various days and times, for longer periods of time and more time should be given for the patrons to notice and adapt to the additional decals before final observations are conducted. Besides that, more qualitative interviews may give more insight on reasoning behind waste sorting

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behaviors and ideas to improve the signage. Lastly, observer errors may be overcome by physically counting the waste thrown away.

## **Conclusion**

Our CBEL project contributes to the large gap in academic evidence on the effectiveness of waste station signages. Given the fact that greenhouse gases are escalating due to landfill waste (City of Vancouver, 2016), it is important to investigate multiple approaches to improve public waste sorting accuracy and a cultural shift towards sustainable values. Our data shows that waste signage in general is valuable and effective in promoting proper waste sorting, and additional waste decals may improve waste sorting accuracy at KCC. However, it has yet to be proven that the additional waste decals would show the same effect in other settings.

Moving forward, we recommend further research to obtain insight into the feasibility and value of implementing the additional decals city-wide. Besides that, we suggest including images of the most commonly mis-sorted items, taking out any repeated images, and perhaps adding short, informative messages regarding the implications of proper waste sorting on the waste stations.

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## Appendix

### Data Collection Table

#### 1st Site visit notes - Oct 7,2016

5-6 pm Killarney Community Center

Legend:

Target people: (K) Kids, (T) Teens, (A) Adults, (S) Seniors

Looked at sign?: "✓" for yes, and "X" for no

Accuracy of sorting: 0- Did not sort correctly

1- Partially sorted correctly

2- Sorted correctly

Table 1a. Waste diversion behaviour with only original signages at main entrance location

K/T/A/S	0/1/2	Looked at sign?	Item sorted Incorrectly
K for kids	0	✓	compost container, plastic fork
K	1	X	paper ticket
K	2	✓	
K	0	X	bubble gum
T for teens	2	X	
T	2	✓	
T	1	X	bubble tea cup
A for adults	2	✓	
A	2	✓	
A	0	X	paper packaging for straw

A	0	X	paper cup, straw
A	2	X	
A	1	X	banana

Table 1b. Waste diversion behaviour with only original signages at ice rink area

K/T/A/S	0/1/2	Item Sorted Incorrectly	Looked at sign?
T for teens	2		N
A for adults	2		Y
A	2		Y
T	2		Y
T	2		N
T	2		N
T	1	Paper cup	Y
A	2		Y
T	2		Y
A	2		Y
T	0	Used tissue paper	Y
A	0	Used tissue paper	Y
A	2		Y
A	0	Used tissue paper	Y
A	2		Y
S	2		Y
T	0	Used tissue paper	Y
A	2		Y
K	0	Used tissue paper	Y

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K	2		Y
K	2		N
A	2		Y
A	2		Y
K	2		Y
A	2		Y
A	0	Used Tissue Paper	N
A	2		Y
A	2		Y
A	0	Paper Cup	Y
K	0		Y

Site visit #1 Interview results:

- (1) Found that the decals were useful. They suggested that the signs should be translated in Chinese/Indian because many people in this community don't know english. They also suggested that the pictures should be bigger.
- (2) Found the decals to be useful and clear. They also suggested that the words on the signs should be bigger. They were also confused where the plastic spoon/fork goes.
- (3) Found the decals to be useful and clear. No other suggestions made.
- (4) Found the decals to be useful and clear. No other suggestions made.
- (5) Found the decals to be useful but mentioned that they don't really use the signs themselves. They suggested that we should educate people why they need/should recycle. They also suggested that we should educate kids and be in the community to teach people how to sort.

(6) Found the decals to be useful and clear. They mentioned that not all places have compost so sometimes they are not able to sort properly. They also mentioned that when they are in a rush, they just put everything into one bin and do not sort.

## 2<sup>nd</sup> Site visit notes - Oct 14,2016

5-6pm Killarney Community Center

Legend:

Target people: (K) Kids, (T) Teens, (A) Adults, (S) Seniors

Looked at old/new sign?: "✓" for yes, and "X" for no

Accuracy of sorting: 0- Did not sort correctly

1- Partially sorted correctly

2- Sorted correctly

Table 2a. Waste diversion behaviour with additional signages at main entrance location

K/T/A/S	0/1/2	✓/X Old	✓/X New	Item sorted Incorrectly
K	2	X	X	
K	2	✓	X	
K	0	X	X	paper plate+food
K	0	✓	X	yogurt container+plastic spoon
K	0	X	X	yogurt container+plastic spoon
T	0	X	X	wrapping paper
T	0	✓	X	napkin
A	0	X	X	receipt
A	0	X	X	receipt
A	2	✓	X	
A	0	✓	X	
A	0	✓	X	napkin

A	2	✓	X	straw
A	0	X	X	paper wrist band
A	2	X	X	
A	2	✓	X	paper container
S	0	X	X	paper letter
S	0	X	X	spit...
S	0	X	X	paper

Table 2b. Waste diversion behaviour with additional signages at ice rink area

K/T/A/S	0/1/2	✓/X Old	✓/X NEW	Item sorted Incorrectly
A	2	✓	X	
T	2	X	X	
A	2	✓	X	
T	1	X	X	Paper cup
T	0	✓	X	Paper cup
T	2	✓	X	
T	2	✓	X	
T	1	✓	X	Paper cup, tissue
A	2	✓	✓	
A	1	✓	X	Straw wrapper
K	2	✓	X	
K	2	✓	✓	
A	2	✓	X	
A	2	✓	X	
K	2	✓	X	
A	2	✓	X	

A	2	✓	✓	
A	1	✓	X	Paper
K	2	✓	X	
A	2	✓	X	

Informal Interviews:

Comments/Suggestions from Site visit #2

- (1) Not sure if the new decals are needed. The images in the new decals should be different objects/materials than top, no point of repeating it twice
- (2) Arrows in the top signage not necessary. Confused about where dirty paper containers go. In top signage, bubble wrap in soft plastics looks like a water bottle
- (3) New decals are just repeating itself...
- (4) Try adding decals on the lids as well
- (5) The new decals are not on eye level so they don't stand out
- (6) If I had the chance, i'd prefer to invest money to change the existing signs instead

### 3rd Site visiting notes - Nov 4,2016

5-6pm Killarney Community Center

Target people: (K) Kids, (T) Teens, (A) Adults, (S) Seniors

Looked at old/new sign?: "✓" for yes, and "X" for no

Accuracy of sorting: 0- Did not sort correctly

1- Partially sorted correctly

2- Sorted correctly

Table 3a. Waste diversion behaviour with additional signages at main entrance location after 2 weeks of implementation

K/T/A/S	0/1/2	✓/X Old decals	✓/X New decals	Item sorted incorrectly
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K	2	✓	X	
K	2	X	X	
K	1	✓	X	plastic spoon
K	2	X	X	
K	2	X	X	
K	2	X	X	
T	2	✓	X	
T	0	X	X	
A	2	X	X	
A	2	X	X	
A	2	X	X	
A	2	X	X	
S	2	✓	X	
S	2	X	X	

Table 3b. Waste diversion behaviour with additional signages at ice rink area after 2 weeks of implementation

K/T/A/S	0/1/2	✓/X Old decals	✓/X New decals	Item sorted Incorrectly
T	2	X	X	
T	2	X	X	
T	2	X	X	
T	2	X	X	
A	2	✓	X	
A	2	X	X	
A	2	X	X	
A	0	X	X	Paper - landfill

A	1	X	X	Paper Container-Landfill
K	1	X	X	Used paper- Landfill
A	2	X	X	
A	2	✓	X	
T	2	X	X	
K	0	X	X	Paper - Landfill
A	2	✓	X	
A	2	✓	X	
A	2	✓	X	
A	2	✓	X	
A	2	✓	X	

Interview:

- (1) Images need more variety, no point of repeating itself. Arrows in top signage covered some of the food, especially the blue one.
- (2) Most people didn't notice the new signs until they were mentioned.
- (3) One person thought the top signage was better because the images were easier to see with the contrast in the white background.
- (4) One person was confused where the paper towels should go in.
- (5) A person from Surrey said the headings on the signage was not consistent with where he's from. He said it gets confusing when he sees mixed containers when he is used to seeing recyclables, and food scraps should be called organics.
- (6) Coffee cup images should be bigger. Decals should be higher. Maybe overtime if we focus on associating colours with the bins it will get better (Ex. green with

compost, blue with recyclables, and yellow with paper. Maybe we can invest in having the whole bins those colours so it stands out.

Table 4b. Calculation of data

<p>Effectiveness of signages (%)</p> <ul style="list-style-type: none"> <li>- Percentage of people accurately sorting their waste after looking at signages (old or new):</li> </ul>	<p>(No. of people correctly sorting their waste and looking at either the old or new signage on the 2nd and 3rd visit/ No. of people looking at either the old or new signage on the 2nd and 3rd visit) x 100%</p> $= [(18+3+10)/(26+3+11)] \times 100\%$ $= 31/40$ $= 77.5\%$
<p>Increase in Waste Sorting Accuracy after the new additional waste decals were added:</p>	<p>Average accuracy of 2nd+3rd visit - accuracy of 1st visit</p> $= (25+27)/(39+33) - 27/43$ $= 0.72 - 0.63$ $= 9\% \text{ increase}$

## Critical Reflections

### Student 1

I thought that the CBEL project was a very successful project for our group. Our meetings with our community partners went smoothly each time. During our meetings with Jeanie and Paul, from CityStudio and the City of Vancouver respectively, it was very interesting to be able to have our meetings in conference rooms both in City Hall and at CityStudio. In the beginning of our CBEL project, I was very excited about the project and wondered how it would turn out. I was initially quite intimidated when going to our group meeting, since it seemed like it would be a very formal and I did not know what to expect. I was fairly nervous, but it was more reassuring when Jeanie and Paul clearly laid out

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what was expected from us for this project and gave us guidelines. They were very helpful in assisting us on the Put Waste In Its Place project, and I was very thankful for their assistance. Our group also worked efficiently and productively each time we had group meetings, and we communicated well with each other outside of class as well. I was surprised that the decals did improve the accuracy of the waste diversion rates, since the other members that did the site visits mentioned that people did not seem to notice the decals. However, it was relieving to find out from our data that the added decals did make a positive difference.

## **Student 2**

I am appreciative of doing the CEBL project with such an awesome group. I was always interested in studying and working on environmental protection area. Through this “Waste to Zero” project, we didn’t work on reducing waste directly, though, we tried to remind and guide people sort their waste correctly by setting new decals. As the result shows, those decals did help to increase the accuracy of waste diversion in Killarney Community Centre.

Our project began with a meeting at Vancouver City Hall, Jeanie and Paul has explained all details of the project very clearly and patiently and took us to the garbage collection corner to show us how do the decals could work. I felt they had a high sense of responsibility of making contributions to the environment and gave us great expectations on this project. After several group discussion during flexible learning sections, we set three dates visiting Killarney Community Centre and conducting informal interviews with centers visitors. I would say all plans are made very organized due to the great corporation of our group. We contributed each other’s idea actively and wrote effectively during each meeting; besides class, we are also good friends, partners. Every time, when some of us met troubles, the other members tried best to help her/him. Meanwhile, we created a group chat, and we could receive the process of each project updated in time and did reaction at the first second. Such active attitudes brought us more opportunities learning faster and more effective.

However, in terms of the project, I still believe some parts are not perfect enough and could be improved well. For instance, since there are already some decals on the

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garbage can, and many visitors in Killarney Community Centre are immigrants and might not read English well, it would be more helpful if we could make new decals with multilingual description. I believe, with joint efforts by the society, more people will understand the garbage classification well, the accuracy of waste diversion will be increased gradually, and the “Green Vancouver” will be built soon in the future.

### **Student 3**

I gained invaluable real-world experience and skills through proposing, implementing, and evaluating the CBEL project. One significant lesson I realized from the process of making this project is how important constructing project proposal is. Before doing the project proposal, I felt that planning, evaluating, or proposing is just a waste of time and action is what matters most. However, I realized that constructing project proposal helped me understand my motivation of doing the CBEL project. I am convinced that the project I am doing can create positive contribution to the community through critically thinking about the purpose, objective, and significance of the project. The process of writing the proposal report changed my motivation of doing the CBEL project from getting good mark to successfully help reduce greenhouse gases and negative economic impact from landfill waste. This motivation drives me to be more curious, search for better ways to reduce waste, and understand the issue deeper as I dig for informations on why waste reduction initiatives can be inefficient when I write my academic experiential review paper. After finishing this course, I truly believed that the skill of constructing proposal report is sought after by employers and I will remember making proposal report before implementing an action in my future endeavors.

### **Student 4**

Throughout the CBEL project, I gained significant experience in creating, planning, and implementing a community-based initiative. Furthermore, being able to collaborate cohesively with a hard-working group throughout the entire term made the entire experience even more rewarding, creating a sense of team accomplishment at the completion of our project.

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Overall, the most significant thing I learned was how much more I was able to learn during the flexible learning sessions compared to standard lectures. Meeting with our community partners, and even just having group meetings made it easier for me to really absorb and apply specific course learning objectives. I really appreciated the time given for group work throughout the flexible learning sessions as well as during the tutorials. This made time-management for other courses and responsibilities seem less overwhelming.

Having a “real-life” community project made me feel much more connected and motivated towards our project goals, compared to most school projects that are predominantly hypothetical. In addition to this, we were extremely lucky to work with our specific community partners, Paul and Jeanie, who instilled constant passion, enthusiasm, and gratitude towards our project progression. I also enjoyed working on the Academic and Experiential review paper because it allowed me to explore a broader, more global issue relating to the CBEL project. This really highlighted the relevance and significance of what we were doing.

Finally, our group blog allowed us all to participate in continuous self-reflection throughout the term, which helped us to check in with each other and make sure we were on track with our weekly goals. Overall, I feel that this course gave me valuable skills in teamwork, proposal-making and knowledge that I will use in the future.

## **Student 5**

I am grateful to have the opportunity to work on such a great CBEL project. Our collaboration with City of Vancouver and City Studio was very organized and our community partners, Jeanie and Paul, were very supportive and helpful throughout the entire process. Overall, this project made me realize the importance of building partners and relationships with different organizations to help create a stronger community. I think that it is through these collaborations that make the most significant changes. The project gave me new perspectives about waste diversion and by working in a group, it was easier to develop ideas. I found the flexible learning times extremely helpful in allowing our group to meet up with each other and our community partners. Because we are a group of six people, it was difficult to find any time outside our flexible learning

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time to meet up. It was also nice to have an online platform to journal our entire process because it helped us reflect on how we are currently doing and what steps we need to take next. The most significant moment in this project for me was going out in the community and collecting data. Initially, it was difficult to approach strangers to ask them to be interviewed, but after doing it several times, I realized that despite being rejected a couple times, the more people you ask the more information you will collect. I believe that the skills I've gained through this project will be very valuable for my career and academic development.

## **Student 6**

The "Put Waste In Its Place" CBEL project allows me to integrate my academic knowledge into the real life scenario and that opens my eyes. This project has taught me that group work and community connection are two of the main keys to be successful in most of the community projects. It was rewarding to collaborate with a professional organization which has led and explained every detail to us throughout the whole process. It was also amazing to circulate ideas with a team of people from different disciplines and work hard to achieve the project goal. Furthermore, having the opportunity to participate and present our project findings in Hubub was indeed the most significant experience. We have got the chance to mingle around and see a lot of creative projects designed by institutions across Vancouver to contribute to the city's sustainability. All these episodes have expanded my knowledges and made me understand that achieving sustainability does not only demand professional skills, but it also requires joint-efforts from the community members. Although it was quite intimidating for me to talk to people who I am not familiar with at first, I have realized that stepping out of the comfort zone to engage into conversations would equipped myself on both of my academic and career journey.