

# **LFS 350: Put Waste in its Place**

## **Project Report**

A report submitted in partial fulfilment of the requirements of  
LFS 350 Land, Food, and Community II

at  
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Instructor: Dr. Will Valley

Teaching Assistants: Colin Dring, Latika Raisinghani, Fransisco Gomez, and Carrie James

## Introduction

The Put Waste in its Place: The Zero Waste Station Challenge collaborates with the City of Vancouver and CityStudio, with a focus on increasing waste diversion rates at community centres . Created in 2012, the City of Vancouver's Greenest City Action Plan is a roadmap for overcoming urban sustainability issues and realizing a healthy, prosperous, and resilient future for the city (City of Vancouver, 2012). One of the programs in the Greenest City Action Plan is Zero Waste, the diversion of waste from the landfill (City of Vancouver, 2012). By 2020, the Zero Waste program targets to reduce solid waste going to the landfill or incinerator by 50% from 2008 levels (City of Vancouver, 2012). With concerted effort from the City and the residents, Vancouver is slowly evolving into a zero waste community each year. CityStudio is an innovative hub within City Hall that connects the City of Vancouver and students in experimenting with innovative solutions to solving sustainability challenges (Citystudio, 2017). Particularly, the Zero Waste Station Challenge is an ongoing project that started in 2013, with past focus on ways to improve communication elements such as lid decal designs that increase awareness of waste sorting among community members (UBC Wiki, 2017). In this semester, the aim of the Zero Waste Station Challenge will be to develop lid decals at selected waste stations and subsequently evaluate the effectiveness of these newly designed decals at the Kerrisdale Community Centre. By participating in this project, our team members expect to learn about the connection between behavioral change and sustainability. In addition, we will learn more about the City of Vancouver's Greenest City Action Plan and Zero Waste Strategy.

## Significance

The Zero Waste Station Challenge has economic, environmental, and social significance. In British Columbia alone, each person deposits on average over 600kgs of waste every year (RCBC, 2017b). In 2015, a total of 382,711 tonnes of municipal solid waste were disposed of at the Vancouver Landfill (City of Vancouver, 2016). With improved waste diversion, the amount of money spent on the collection, hauling, and management of avoidable wastes could otherwise be invested on social welfare programs that pay back to community members. Environmentally, with improper waste sorting, organic wastes such as food scraps are sent to the landfill with other garbage, where they release a significant amount of methane, a greenhouse gas that makes significant contribution to global warming (FAO, 2013). Through public display of waste reduction messages, the Zero Waste Station Challenge, or other zero waste initiatives, are able to inspire greater community involvement and innovation in the building of a greener city. Although many studies have been done in cities across the globe on how to effectively design waste management systems to create 'Zero Waste', there seems a lack of studies on how waste bin labels affect waste sorting behavior (Zaman & Lehmann, 2011). As a result, our study will approach this topic by conducting a study on the effectiveness of lid decals on sorting accuracy.

## Inquiry Questions

This project is intended to address these inquiry questions:

1. How does the newly designed lid decals affect people's efficiency of waste sorting at the Kerrisdale Community Centre?
2. What items are more likely to be sorted properly or improperly at the Kerrisdale Community Centre?

3. Does the identity of people such as, race and age, influence the accuracy of waste sorting at the Kerrisdale Community Centre?

## **Methods**

### **Data Collection**

Quantitative data and qualitative data on waste sorting activities in Kerrisdale Community Center were collected through a series of naturalistic observations and informal interviews. Naturalistic observations are important in reducing biases in data because people tend to behave differently when they are aware of being watched (Linden, 2011). Informal interviews were conducted to gain feedback in order to reveal potential improvements in the decal designing. During the first observation without decals, we recorded 1) if people dispose their waste properly, and 2) how long it takes for people to sort their waste after standing at a garbage bin station, and 3) additional information on age group (Kids, Adults, or Seniors), gender (Male or Female), and race (Caucasian, Asian, Aboriginal, or Unknown). Information from (2) and (3) would be helpful to identify what kind of items people get most confused of, thereby helping to design our decals. The second and third observations with our decals took place to see if the stickers had any impacts on correctness of waste sorting. In addition, we conducted informal interviews to obtain honest feedback on the decals from waste station users at the community. (More detailed information, see Appendix).

### **Data Analysis**

We analyzed the first observation data to see if certain demographics are particularly susceptible to waste sorting activities by calculating and comparing a number of ratios regarding different criteria (see Table 1.3). The subsequent observations with the decals were also analyzed by comparing data with and without decals to see the impact of the decals in terms of waste sorting accuracy.

Finally, we analyzed interviews to understand what people think of decals themselves, to measure their usefulness, and to determine explanations behind the data and feedback.

### **Ethical Consideration**

The study was conducted on the basis of the TCPS-2 on Research Ethics. When conducting our research, we made sure that participants are well informed of the right to decline and withdraw their participation at any time. In accordance with an approach used by Asset-Based Community Development that listening to a community helps find out what people in the area want and thus it helps development move forward, we sincerely take their comments, opinions, and feedback into consideration throughout our project, hoping that we contribute Vancouver to be the greenest city in the world.

### **Results**

In the first observation, our sample size is 17 and in our 2<sup>nd</sup> observation, our sample size is 16. The accuracy rate of waste sorting for the 1<sup>st</sup> observation is 59% and the average time people spend on waste sorting is 3.6s. The correctness for female and male is 60 percent and 57 percent, respectively when it comes to sorting waste accuracy(See Table 1.3).When we compare the accuracy rate among different age groups, it shows that children did well relative to adult and senior groups(see Table 1.3).The accuracy rate of waste sorting for the 2<sup>nd</sup> observation is 68.75% and the average sorting time is 2.7s. By comparing the accuracy rate of the 1<sup>st</sup> and 2<sup>nd</sup> observation, we can see there is a 10%(see Table 3) increase in the accuracy rate and the average time people spending on garbage sorting decreased by 26% in relative to the average time of 1<sup>st</sup> observation. The numerical data based on observation implies that our decals did help people to sort garbage faster and more accurately. Predictably, all 5 interviewees noticed the decals and the average score for the decals on effectiveness is 4 out of 5(see Table 4). However, one interviewee gives a score

of 1 out of 5 for the effectiveness and he suggests us to have other languages printed on the decals because non-English speakers might not be able to recognize the difference among the decals. Based on the numerical data we can see that our decal designs did a successful job on helping people to sort waste better, however due to the small sample size of our observation, we cannot draw any definite conclusions based on our findings.

Another thing we noticed is that the top miss-sorted item in both observation periods is paper items. In the 1st observation, there were 7 people in total that sorted the garbage incorrectly and 6 of them are related to paper items. In the 2<sup>nd</sup> observation, among the 5 miss-sorted items, 4 of them are paper items. People seem to be confused with sorting paper items even after we modified our decals and for the most of the times they put the paper items into the landfill bin rather than the mixed paper bin.

## Discussion

According to Mathie and Cunningham (2010), asset-based community development is more likely to inspire positive action for change in a community than is an exclusive focus on needs and problems. Therefore, we always focus on the people's strengths on waste sorting and the positive changes that the original decals on the garbage bins have made. In this study, we designed new lid decals based on the suggestions from our community partners as well as our 1st observation results which we found paper items are the top miss-sorted and no significant findings in waste sorting accuracy between different identity of people. After implementing the newly designed decals, we revealed 10% increase in waste sorting accuracy. Although our study was limited by the small data size that we only have 16 and 17 people separately used the waste station during our two observations, the 10% increase in proper sorting showed that the addition of lid decals could have a positive impact on community members' waste sorting correctness.

Except for the small sample size, the possibility of misidentifying items is our another limitation. Because we used naturalistic observation in our study, we have difficulties to identify the waste if people sorted them quickly, and we overcame it by opening the garbage bin and identifying the item after people finish sorting their waste which might influence the accuracy of recording items. We think our study could be improved by collecting data and experiencing our decals in a larger community centre.

Furthermore, it is important to keep in mind that increasing of waste division rate in Vancouver requires collaboration from different aspects. As one of the community member mentioned during the interview, no matter how clear the decals are, it all depends on people to have a sense of social responsibility to sort waste properly. Therefore, we believe more info sessions or public posters on education regarding the importance of waste sorting or the proper methods of sorting wastes should be an efficient step to achieve City of Vancouver's Greenest City Action Plan in further studies.

## **Conclusion**

In conclusion, our project has shown that it is possible to make an impact towards waste reduction in our communities. We have discovered that the implementation of decals to waste stations has resulted in a 10% increase on sorting accuracy. This discovery sheds some light towards the topic of waste reduction where it provides the insight that continued efforts made by citizens of our community through processes such as educating peers will result in improvements for waste management in the near future. One unanswered question that we have is what is the most effective strategy that allows citizens of our community to realize the importance of reducing waste and the impact that ineffective waste sortage has for our environment. Thus, we believe that it is wise to start working on that question by implementing various tactics to educate citizens of our community. These tactics may include information sessions or

public posters. That way, we will be able to ultimately find the most effective education strategy that will be able to generate collective action and ultimately a positive change to our environment.

## **Critical Reflections**

### **Student 1**

I am very grateful that LFS 350 gave this valuable experience to me to integrate my academic knowledge with a real community-based project. Throughout this project, I learned more about the importance of the sorting our waste properly and how the diversion rate can have significant impacts to the environment and financial payback. I also improved my communication and time management skills. However, the learning process was not a straight path. As a project that was packed with observations, community partner meeting, and an additional presentation, it was hard for us to find suitable time periods for our group meetings, but fortunately we overcame by dividing into smaller groups and efficiently arranging meeting time by the website “When2meet”. Furthermore, I learned many important concepts working with the community. There are two points that impressed me the most and will absolutely add a positive impact to all my further community-based works. The first one is that the key of community-based works is to “listen” to the needs of the community instead of trying to teach the community what to do. The other is that we should always look at a community from a positive prospective, understand their advantages, and try to find out what can make the community better. Last but not least, I have to say, although group work could be frustrating and we may have arguments sometimes, I really appreciate the friendships gained from our project.

### **Student 2**

Reflecting on this semester, I am glad to engage with what I am truly interested in and work with like-minded group members and community partners from CityStudio and the city of Vancouver. I have learned a lot throughout the project, but particularly two things struck me the most. This project reminded me that it is

considerably hard to coordinate with one another as each of us had different time schedules, affected by many things outside the school. However, I think we could do better as a team to dedicate more time to greater output. Yet, we failed to find a way to be more productive. That is the one thing I regret we did not come up with a solution since this can always be an issue in real life. Personally, the moment of significance came as the project was about to end by realizing how rewarding real-life projects can be regardless of their level of success. While I was doing this project, I was certainly unsure about what I am supposed to do and how this project would turn out. However, as the semester went by and I got to know more about how important this project can be in helping people sort waste, reducing the amount of garbage thrown away, thus reducing the amount of money required to dispose waste going into landfill. I felt what I am doing is truly contributing to the society using knowledge learned in class over the course of university carrier.

### **Student 3**

This semester has been very engaging for me. I am glad to have gotten the opportunity to work with a community partner. Zero Waste Project was an overall great experience where I thought putting together the infographic and presenting at the Nest was the best learning experience. Furthermore, I thought that the infographic software was surprisingly easy and a useful tool that I will use for future projects. I guess that was because we got the chance to share our project with the public and teach them our discoveries. The flexible learning experiences were a bit trickier because it was difficult to actually get together during that time. However, I appreciated the freedom of learning approach that this class allowed. In terms of group work, initially we were very engaged and organized. However, as the course progressed and there were less and less guidelines, it got confusing. When we went to Kerrisdale community centre to record our data, we found that that community centre had very few people. This made it difficult for us to get data, which meant more trips to the community centre. Thus, it was difficult for our group to coordinate meetings at the community centre due to the frequent trips and our busy schedules. All in all, despite the challenges, it was a good

experience because it was a course that applied aspects of what we would expect to participate in and learn from outside of school (such as for our future career endeavours).

#### **Student 4**

Reflecting on this semester, I had a wonderful experience working with my group members and doing the Zero Waste Project. We collaborated with CityStudio to design decals that can help people in the community to sort waste better and we pulled it through as a team and helped each other whenever we can. During the flexible learning weeks, we had arranged meetings to meet everyone and so we can keep track of all the assignments that are coming up. Although sometimes it is hard to come up with a meeting time that can fit everyone's schedule, we still try our best to have a meet-up time during the flexible learning week. While doing this project, I learned about the significance of recycling and the meaningful goal of the city of Vancouver of having zero waste in the future. After doing this project, I find myself paying more attention to the issue of recycling and sustainability and I would think more carefully before I throw waste into the landfill bin. I feel that we can actually make contributions to help our community become more sustainable because every little action counts. I would also talk about our project to my friends and my family and try to raise awareness of recycling to the people around us.

#### **Student 5**

This semester has been very rewarding and meaningful. I appreciate the opportunity of working with my team members and community partners. Working on such a flexible, self-oriented project while having to meet course requirements and solid deadlines have been difficult, but thanks to my supportive teaching team and collaborative teammates, I've made it through. When working on this project, we experienced some difficulties when trying to implement our proposal in real life. For example, we were frustrated during our second observation because so little people were using the waste stations in Kerrisdale Community Center that we had no other way but to come back another time to increase our

sample size. Also, meeting up in flexible learning sessions proved to be challenging. As a result, we mostly communicated online through our Facebook page, which allowed us to share project materials, ask questions, and provide feedback on each other. As a student in LFS, I have always had an interest in sustainability issues, and this project provided a perfect opportunity for me to not just explore my interest, but also to make a real impact in the community. Specifically, I learned about the recycling programs and many other waste reduction strategies in Vancouver. Although our data might be biased, but I was thrilled by the 10% increase in diversion rate after the implementation of our decal designs. Most importantly, I've realized that small actions count and that everyone's collective effort can really make a difference in our community.

### **Student 6**

What a journey it has been. I started this semester having no idea how our community project would go and if we would make any real impact. Being part of such a large group can be challenging especially when your group work involves collaborating with community partners as well. However this project gave me experience in taking different roles within our group when necessary, including leadership roles as well as stepping back to allow others to have their own equal input into group tasks and assignments. From this experience I feel better prepared to work as a team member and listen to differing perspectives. I most enjoyed our time meeting with our community partners. Their support, enthusiasm and guidance reminded me that you never have to be in something alone. Having no design background I thought that designing decals would be quite difficult but with some guidance from our community partners and some creativity from our group we were able to build a new skill and design decals that actually resulted in better waste diversion. That was pretty amazing. Posting blogs online was always a bit of a daunting task but I think it forced us to reflect on what we were doing at each step of our project and realize how much we've learned and the skills we gained along the way. But the experience I most appreciated was to be a part of City Studios hubbub event and be able to communicate the positive changes our project has made with members of the

community, and further to be recognized for all the hard work was the perfect ending of our journey with this project.

## Appendix

### Decal Designs





**Table 1.** The 1st site visit observation record before decal implementation. 1:00 PM to 3:30 PM on February 10th, 2017 at Kerrisdale Community Center. Sample size: 17 people

Items sorted	Sorted properly (✓) or not ( )	Time used (in second)	Gender ( <u>F</u> emale or <u>M</u> ale) F or M	Age ( <u>K</u> id, <u>A</u> ddult, or <u>S</u> enior) K, A, or S	Race ( <u>A</u> Asian, <u>C</u> Caucasian, <u>O</u> Aboriginal (as <u>O</u> ), or <u>U</u> Unknown) A, C, O or U
Paper towel	✓	2s	F	K	C
Chip bag	✓	2s	F	A	A

Tissue	✓	3s	M	S	C
Coffee cup	✓	10s	F	A	A
Coffee cup	✓	20s	M	S	C
Scrap paper		2s	M	A	A
Scrap paper	✓	2s	F	A	C
Tissue		1s	F	A	C
Paper		1s	M	S	C
Paper	✓	2s	M	S	C
Plastic lid	✓	3s	F	K	A
Paper		2s	F	K	C
Toilet paper		2s	F	S	C
Toilet paper	✓	2s	M	A	U
Straw	✓	2s	F	A	A
Paper		1s	M	S	C
Plastic bag		5s	F	A	A

**Table 2.** Number of people observed in different categories (Gender, Age, and Race)

Male	7	Kids	3	Asian	6
Female	10	Adults	8	Cacasian	10
		Seniors	6	Aboriginal	0

				Unknown	1
Total	17		17		17

**Table 3.** Various ratios based on the first observation

Female/Male ratio	0.63	0.37		
Kids/Adults/Seniors ratio	0.18	0.47	0.35	
Female/Male kids	0.18	0.00		
Female/Male adults	0.35	0.12		
Female/Male seniors	0.06	0.29		
Asian Kids/Adults/Seniors	0.06	0.29	0.00	
Caucasian Kids/Adults/Seniors	0.12	0.12	0.35	
Aboriginal Kids/Adults/Seniors	0.00	0.00	0.00	
Unknown Kids/Adults/Seniors	0.00	0.06	0.00	
Asian Female/Male	0.29	0.06		
Caucasian Female/Male	0.29	0.29		
Aboriginal Female/Male	0.00	0.00		
Unknown Female/Male	0.00	0.06		
<b>Correctness</b>				
Female/Male	0.60	0.57		
Kids/Adults/Seniors	0.67	0.63	0.50	
Asian/Caucasian/Aboriginal/Unknown	0.67	0.50	N/A	1.00

**Table 4.** The 2nd and 3rd (combined) site visit observation record (combined due to the small sample size obtained in the 2nd observation) after decal implementation. 14:45 PM to 15:30 PM on March 26, 2017 at Kerrisdale Community Center and 13:00 PM to 15:00 PM on March 29, 2017 at Kerrisdale Community Center. Sample size: 16 people.

Items sorted	Sorted properly ( ✓ ) or not ( )
Newspaper	✓
Coffee cup	✓
Rice krispies	✓
Wrapper	✓
Solid paper	
Coffee cup	✓
Solid paper	
Tissue	
Saran wrap	
Banana	✓
Pop can	✓
Juice Container	✓
Newspaper	✓
Paper plate	
Apple core	✓
Newspaper	✓

**Table 5.** Percent correctness of waste diversion activities before and after introducing decals

	Before (Without decals)	After (With decals)
% Correctness	58.8%	68.8%

**Table 6.** Interviews of community members after implementing decals

Did you notice the decal?	How much did the decal help you in sorting wastes? (Score from 1-5)	Suggestion for improvements
✓	5	Easy to understand
✓	5	Decals are clear, but it all depends on people to have a sense of social responsibility to sort waste properly
✓	5	Enough information
✓	4	N/A
✓	1	Maybe hard for non-English speakers to understand.

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