

# Upcycling by Crowdsourcing: Leveraging Pro-Environmental Behavior as Corporate Strategy

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## **Abstract**

This report provides a critique of Company X's strategy of reliance on volunteer organizations and makes recommendations to support and improve its collection operations. We used focus-group interviews and a national email survey of volunteer leaders to determine the motivating factors for joining and participating in the program. Our results show that 68% of collection sites are located in schools and that schools are the most productive sites. Most non-school collection sites are primarily female. There are two leading motivational factors for sites: financial rewards and concern for the environment, and site officials would like to be able to share best practices with each other. Anecdotally, collection site officials are frustrated by Company X's customer service and by the long waitlists for the more popular waste items. We recommend that Company X focus in the short-term on increasing its volunteer productivity through improved customer service, by providing volunteer groups a platform with which to communicate with one another, and by sharing specific volunteer demographics with CPG brand partners. In the medium-term, Company X should focus on enhancing its environmental message and diversifying volunteer demographics, and in the long-term, should consider how best to modify its business model in moving forward to find alternative ways of financing Squads.

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Company X and Squad are pseudonyms for trademarked names of our client firm, who wishes to remain reasonably anonymous.

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# 1 Executive Summary

## 1.1 Introduction

As population and consumption grow, the interaction between humans and their waste becomes increasingly complex and relevant for the planet's health. Waste management is now approached from a scientific perspective. How humans manage the disposal and recycling of their waste has sweeping social implications for businesses and the environment. Studying pro-environmental behavior provides understanding for companies, policy-makers, and consumers and lends insight into levers of motivation and aspects of consumer behavior. Company X is an organization that thrives at the intersection of science, waste, and consumerism.

Company X is a company that was founded in 2001. This company's business model provides a unique opportunity to study voluntary pro-environmental behavior. For Company X to operate successfully, the company relies on a network of 24 million volunteers who send specific waste streams to the company for upcycle or recycle. In January of 2011, a team comprising University of Michigan School of Natural Resources graduate students as well as three dual degree masters students with the School of Natural Resources and the Ross School of Business endeavored to map the motivations and behaviors of this volunteer "Squad" as Company X refers to its collectors.

Specifically, this team explored the factors, environmental or otherwise, that motivated participation in Company X's upcycling program. With this information, the team sought to develop a communications strategy to incent greater participation in the program while supporting Company X's long-term company strategy. After considerable research and a large scale survey sent to approximately 72,000 Squad leaders in the United States, the team developed a strategic outline for the company that would protect and ensure the long-term revenue growth of the organization.

## 1.2 Methodology

The research methods and data analysis used to analyze the defined questions were staged over the course of ten months. The initial phase involved conducting a literature review of the pertinent academic literature currently available. The literature reviewed fell into three broad categories: studies examining value orientations and attitudes, context for pro-environmental behavior, and organizational factors. Rather than embrace a single model of pro-environmental behavior, the complex Squad structure and incentive system mandated that we instead select relevant features from a variety of studies. The area with the most available research related to how value orientations and environmental attitudes stimulate pro-environmental behavior.

After creating a proposed framework of intrinsic motivating factors based on the literature review, the team conducted preliminary interviews with selected local Squad leaders to collect first-hand data on the nature and operations of Squads. This anecdotal information was used to further refine our hypotheses

and inform the creation of survey questions.

A survey was constructed to be released nationwide to Company X's Squad leaders. The third phase was focused on both qualitative and quantitative factors and took the form of a 30 question survey. It was determined that the survey would be sent nationwide to Squad leaders and would need to measure a variety of metrics, including the following:

- Level of participation, as measured by frequency of shipments and length of participation
- Squad characteristics and demographics, such as size and type of organization
- Measures of Squad culture, such as supportiveness and altruistic behavior
- A self-assessment of motivational factors for participation
- Methods employed by the collection site for organizing participation
- Measures of environmental awareness, perceived effectiveness, and access to other recycling services
- Measures of consumer behavior and interest, in order to directly inform Company X strategy
- Measures of belief in climate change and the importance of mitigation and adaptation amongst those participating in pro-environmental behavior, in order to serve the current research interests of the sustainability community as a whole

### **1.3 Summary of Findings**

Based on 4,168 responses, responses were measured categorically and were analyzed using three different approaches: cross tabulation, bivariate regression, and an iterative stepwise regression.

Key findings show that 68% of Squad sites are located in schools, and collection processes vary radically from Squad to Squad. This is validated by the primary source interviews as well as the survey results. Also, concern for the environment is the dominant motivating factor behind participation (65%) with "donation to your organization (or to a charity)" at 55%.

After surveying the Squad leaders, the findings were reconciled with Company X's resources and the opportunities provided by the company's current business model. Based on interviews with key employees throughout the organization, its ability to leverage its core capabilities to deliver value to Squad members and to capture value through partnerships, sales of raw materials, and sales of upcycled materials became apparent.

In order for Company X's current business model to succeed, a stronger focus on capabilities in customer service and client management will be essential. By focusing on customer service and client management, Company X will be able to

grow productivity and, thus, increase the revenue of the organization. Currently, about \$750,000–1,000,000 in revenue is left on the table due to X’s inability to activate dormant collections sites.

This can be done in three primary ways:

1. Focus on Ways to Grow Productivity
2. Focus on Ways to Strategically Grow Collection Sites
3. Think Big About the Future of the Company X Business

## 1.4 Recommendations

Within each of the above categories, Company X has opportunities for improvement, enhancement, or new growth. These are outlined below:

### **Ways to Grow Productivity**

1. Focus on customer service
2. Share best practices across heterogeneous Squad sites
3. Share demographic information about Squads with CPG companies
4. Identify the optimum number of items collected to support CPG partner
5. Look at other service offerings that fit within the core capabilities of Company X that can better serve the Squads

### **Ways to Strategically Grow Collection Sites**

1. Enhance environmental targeting of collection site leaders
2. Focus on school success
3. Promote demographic diversity

### **Ways to Think Big**

1. Design for upcycle with brand partners
2. Partner with retailers
3. Begin looking at municipalities and waste management organizations as possible sources of waste
4. Close the loop and partner with manufacturing companies to design new products
5. Create a hybrid business model (nonprofit/for profit)



## 2 Introduction

This project, a partnership between University of Michigan School of Natural Resources students and Company X, originated during the fall of 2010. It was conceived during the National Net Impact Conference hosted at the Ross School of Business.

Company X is a nine-year-old company whose goal is to eliminate waste by creating national recycling systems for nonrecyclable or hard-to-recycle waste. Company X collects waste from over 24 million people at 90,000 locations, such as offices, schools and community-based organizations. This network, known as the Squad system, supplies an abundance of Company X's post-consumer materials for production of consumer products and materials.

Company X creates revenue in three ways: partnerships with brands (including an annual fee and a per-unit collection fee on waste sent through Squads), licensing fees, and sales of materials or products made with recycled or upcycled waste. Company X sources pre-consumer waste from its existing brand partners. This supplements post consumer waste received through the Squad programs. Squads are self-organized and operate with varying degrees of volume shipping and are often located at schools, homes, and businesses. Sign up occurs on the Company X website, after which, the individual or group chooses to register for one or more Company X Squads to begin collecting waste.

At the beginning of this project there were 14 million Squad members; that number has since climbed to 24 million (Company X, 2011). This is a substantial growth in the number of Squad members over the course of 10 months; therefore, one of the challenges the company faces is how to best engage all of these individuals and simultaneously scale up infrastructure and logistics operations to handle the spike in waste being received. It was agreed that using environmental psychology to leverage Squad participation would, therefore, be a primary focus of the project.

Waste collection is limited by the brand partners, who cap the total number of waste units that can be collected per Squad. A Squad is defined in two ways: (1) the overarching Squad that consists of the 24 million members sourcing waste; and (2) the brand category Squads such as Capri Sun, Solo Cup, etc. that are subgroups that exist under the larger international Squad. These Squads operate in 16 countries around the world, and Company X has paid \$3.4 million to charities globally through collection agreements.

Donations to charity are a result of the financial incentive offered to Squad members (collectors) for sending their trash to Company X. An example is the current \$0.02 donation that is given to the collection site or designated charity for each CapriSun juice pouch that is collected. These amounts vary for each Squad and serve as an incentive for Squad members to collect waste for Company X. This will be explored further in later sections.

As a core business focus, this document will address the company's user engagement strategy for these various types of Squad locations—schools, homes, businesses, etc. The authors will look to identify demographic information, levers of motivation, and other factors that relate to high and low performing

areas. With this information, the scope of the project will consist of connecting survey information with current knowledge that exists on environmental psychology and pro-environmental behavior and motivation. Using this information and the strategic information gathered on Company X, the authors of the document will attempt to identify factors that are essential to leveraging behavior, and this information will be used to inform a strategic plan for Company X to bolster the engagement levels of the Squads.

The initial project was agreed upon and scoped as follows:

The team will:

1. Identify the strength of member brand recognition and loyalty, and identify factors, both environmental and otherwise, that motivate such behavior and participation in Company X's up-cycling program.
2. Propose an overall communications strategy that will incent greater participation, increase brand loyalty, increase number of Squad members, and support Company X's long-term company strategy of being responsible for collecting every non-recyclable waste stream globally.

As is typical for major projects, the scope and focus of the team's research evolved as the project progressed. Clearly, Company X's business model is both unique and complex. It was only after a visit to the Company X headquarters that the team realized that an in-depth analysis of this business model would be essential to developing comprehensive recommendations that would be maximally effective for moving the company moving.

At this point in the project, the team had already heavily researched the two objectives listed above; however, in order to gain an understanding of Company X company culture, as is essential to writing implementable recommendations, the team traveled to Company X headquarters in September 2011. After touring the company's incredible office space constructed almost entirely from waste, the team met with representatives from multiple departments in order to gain in-depth information on the company's operations and goals. After considerable research and reflection on Company X's business model and strategic objectives, item two of the initial scope required further thought to determine the efficacy of building the Squads as the primary strategic objective of this project. The University of Michigan team, therefore, proposed that an additional item be added to the scope<sup>1</sup>. It is as follows:

- 3 Provide a strategic outline for the company to diversify its collections that provides the opportunity for long-term revenue growth and the achievement of the company's goal to collect non-recyclable waste streams.

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<sup>1</sup>It should be noted that this change has been discussed with both the client and the team's academic advisor

## 3 Company Overview

### 3.1 Early History

Company X is a privately held company founded in 2001. The company currently has over 50 employees, and offices in 14 countries.

From 2001 to 2005 Company X built its fertilizer business, which gained placement in American and Canadian Home Depot and Walmart retailers within four years of its inception. In 2007, Company X launched its first post-consumer waste upcycling service with Honest Tea. This led to partnerships with other consumer goods companies such as Kraft Foods, Lays and Starbucks. Although Company X is currently known as a post-consumer waste upcycling company and an eco-friendly manufacturer, the activities of the company’s initial plant food business significantly influenced its current venture. Company X’s natural plant food from its inception was packaged and sold in reused containers. Early in the company’s history, it was difficult to source used soda bottles for packaging and, thus, a “Bottle Squad” was engaged to source the waste. When the company was manufacturing fertilizer, its primary goal was to “become the most environmentally friendly consumer-product company” in the world (Company X CEO, 2009). While pursuing this goal, Company X discovered that the sourcing of bottles from consumers was the key activity and would be the crux of its future business model. Sourcing of post-consumer plastic bottles became the vehicle for delivering its fertilizer product. Additionally, Company X relied on local restaurant businesses to supply its composting system.

### 3.2 Company X Today

The core philosophy that Company X abides by today developed from the fertilizer business’ use of food and plastic waste as raw material. This philosophy stems from a focus on turning negatively valued waste into highly valued materials or products. Furthermore, the use of bottle Squad suppliers for the fertilizer business led to the initial inspiration for the company’s current business model. This has since developed into a network of 24 million Squad members that are now supplying waste of all types for upcycling.

By relying on Squads to supply Company X with raw materials, Company X now sells brand preserving waste diversion services to companies in an effort to turn negatively valued waste into valuable material through an upcycling or recycling process. In Company X’s process, processing the waste (either by upcycling or recycling) results in the generation of one primary product category that can be sold for profit. This product category consists of a refurbished consumer product made from moderately modified post-consumer content. This group generally consists of consumer packaged goods (CPG) branded products such as pencil cases, binders, tote bags, and backpacks, which are sold to consumers and businesses. Company X also converts a portion of the waste it collects to its second product category, PET pellets, which can be sold to manufacturers of products made with post-consumer materials. This second product

category is sold to manufacturers. Aside from the revenue streams generated from upcycling and recycling materials, Company X makes profits from fees paid by CPG companies to enroll their products in Squad programs and from licensing fees generated from products. In order to sustain Company X's goal of diverting all waste streams from landfills, the company currently relies on the business model detailed in Figure 1.

The previously mentioned product categories rely on supplies that are generated by Squad members. Company X retains Squad members through various management strategies, but recruitment of those members relies heavily on the customer base of the consumer packaged goods company with which Company X partners. There is, however, a tipping point at which the consumer packaged goods company begins to play a role in Squad member retention.

When Company X partners with a brand on a Squad program, consumers have the option of enrolling in a Squad collection team for items in that brand's category of products. This increases consumer engagement for the sponsoring brand and positions the brand as an eco-friendly option. Furthermore, it increases the volume of products collected and sent to Company X. The increase in products collected requires the brand to provide more funding to Company X to sustain the program; however, once the funding requirements go beyond the brand's budget, the brand will traditionally pull back and Company X may lower the donation Squad members receive per item collected. This pullback can have one of two effects:

1. It could encourage consumers to buy more of the product in order to maintain the donation amounts they were previously receiving.
2. It could frustrate the Squad members, serving to lower their trust in Company X and potentially their trust in the partnering brand. This could result in a negative brand perception for Company X and the CPG partner and a decrease in collection participation.

Company X has minimal data to determine whether this feedback loop has a positive or negative effect. The implications of this feedback cycle could be paramount to Company X's future brand partnerships, and it should be tested further to evaluate the impact it may have on long-term Squad member retention. Company X should begin to look at Squad participation after a brand collection pullback has occurred to understand how participants are reacting. Participation data, surveys, or customer interviews could be used to measure Squad member reactions.

<b>Key Partnerships</b>	<b>Suppliers:</b>	<b>Key Activities</b>	<b>Value Proposition</b>	<b>Customer Relationship</b>	<b>Customer Segments</b>
<ul style="list-style-type: none"> <li>• CPG consumers (Squad members)</li> <li>• Retailers (collection site hosts)</li> <li>• CPG manufacturers (pre-consumer waste)</li> </ul>	<ul style="list-style-type: none"> <li>• Post/pre-consumer waste collection, storage, and manipulation</li> <li>• Squad management</li> <li>• Squad/CPG CS</li> <li>• Licensing</li> </ul>	<p>Provide opportunities to:</p> <ul style="list-style-type: none"> <li>• Avoid negative advertising</li> <li>• Boost consumer engagement</li> <li>• Position brand as eco-friendly</li> <li>• Improve CSR claims</li> <li>• Additional grassroots publicity</li> <li>• What is VP to manufacturers (need for recycled content)</li> </ul>	<ul style="list-style-type: none"> <li>• Bus dev pitch</li> <li>• Client management</li> <li>• Retail activation</li> <li>• Manufacturers</li> </ul>	<ul style="list-style-type: none"> <li>• CPG brand managers</li> <li>• Upcycled product manufacturers</li> </ul>	
<b>Buyers:</b>		<b>Revenue Streams</b>			
<ul style="list-style-type: none"> <li>• CPG companies</li> <li>• Manufacturers of upcycled products</li> </ul>	<ul style="list-style-type: none"> <li>• PET pellet sales/purchase of raw materials</li> <li>• CPG Squad fees, product purchase, retail activation</li> <li>• Licensing fees</li> </ul>				
<b>Cost Structure</b>		<b>Channels</b>			
<ul style="list-style-type: none"> <li>• Waste Inventory Collection/Storage/-Transportation</li> <li>• Employees &amp; staff (Squad man/CPG CS)</li> <li>• R&amp;D</li> <li>• PP&amp;E</li> </ul>	<p>VP delivered by:</p> <ul style="list-style-type: none"> <li>• Divert CPG (pre-cons) &amp; consumer (post) waste</li> <li>• Creating positive brand image</li> <li>• Provide material to manufacturers</li> </ul>				
		<b>New Business:</b>			
		<ul style="list-style-type: none"> <li>• Business services (hospitality)</li> <li>• Office space design</li> <li>• Product design</li> </ul>			

Figure 1: Business Model Canvas

## 4 Methodology and Research

### 4.1 Summary of Academic Literature Review to Inform Squad Member Interviews

This project’s research on motivational factors promoting pro-environmental behavior began by consulting Professors Rachel Kaplan and Raymond De Young of the University of Michigan, for recommendations on relevant studies and academic literature to review. The literature reviewed fell into three broad categories: studies examining value orientations and attitudes, context for pro-environmental behavior, and organizational factors. Rather than embrace a single model of pro-environmental behavior, the complex Squad structure and incentive system mandated that we instead select relevant features from a variety of studies. The area with the most available research was on how value orientations and environmental attitudes stimulate pro-environmental behavior.

#### 4.1.1 Value orientations and environmental attitudes

In a heavily cited study (Clark, 2003), a survey was conducted of participants (and non-participants) in a premium-priced green electricity program in order to determine primary motivating factors for participation. Measured factors included the environmental attitudes held by the participant, concerns related to ecosystem health, personal health, local environmental quality, global warming, and “warm-glow” feelings of intrinsic satisfaction. Additionally, household income and other socio-demographic characteristics were measured. The results suggest that the top environmental attitudes held by participants were biocentrism and altruism while egoistic (self-centered) attitudes were less common. Ecosystem health was rated as the greatest concern and warm-glow satisfaction as the least. The study also found that females composed the majority of the program’s participants, although this was not statistically significant in some regressions. In general, participants had a greater household income than non-participants.

The Clark study served as a foundation for our research in that it was a starting point for developing questions for local Squad participant interviews. Our team was especially curious to see if the study’s findings relating gender, income, and participation would hold true for the Company X Squads. It was quickly recognized that because Company X offers a monetary incentive for many of its participating collections, concern for the environment may have been less responsible for Squad activity than it was for the green electricity program’s participation. As such, studies that examined value orientations and environmental concern were sought.

De Groot and Linda (2010) examined the predictive power of three value orientations (egoistic, altruistic, and biospheric) and six levels of self-determined motivation (ranging from intrinsic motivation through external regulation and amotivation) on pro-environmental behavior. These six levels represent a scale of the self-motivation of an action. The results of the study ultimately suggest

that values were more predictive of pro-environmental behavior than motivation type, though the difference was not always statistically significant. Those engaged in the most self-determined pro-environmental behavior were typically more altruistically and biospherically oriented. Because the study suggests that value orientations were more predictive of environmental behavior than degree of self-motivation, and because the organizational structure of the Squad system makes measuring level of self-motivation difficult to generalize for a collection site as a whole, the team chose not to explicitly measure different levels of self-determined motivation in the respondents. The de Groot and Linda study (2010) also led us to develop a series of questions to gauge both concern for humanity and concern for the environment separately (representing altruistic versus biospheric value orientations). In our survey, we sought to measure these for both the leader of the collection site (“How concerned are you about each of the environmental problems listed below?”) and as part of organizational culture (“How often does your organization volunteer in environmental initiatives, such as tree planting or highway cleanups?”).

#### **4.1.2 Context for Pro-Environmental Behavior: Access, Competency, and Social Support**

Barr (2007) conducted a study of household waste management and recycling behavior as they relate to environmental attitudes as well as the context in which recycling occurs. Like the de Groot and Linda study (2010), it was found that believing in an intrinsic value in nature or advocating environmental protection within the wider context of sustainable development appears to enhance both intentions to act and actual behavior; however, it was found that recycling behavior specifically is underlain by more normative influences, explained most probably by the fact that recycling can be seen as accepted behavior that relies less on fundamental values than on practical issues. Easy access to recycling facilities was found to have a major impact on recycling behavior. The effect of abstract knowledge is generally weak, whereas policy knowledge (for reduction behavior) and concrete knowledge (for recycling behavior) is more significant. Barr’s study (2007) led us to question how the access, experience, and trust in recycling services affected participation in Company X. The hypothesis that increased participation in recycling would increase feelings of competency and trust related to handling waste (and, therefore, increase participation in Company X) seemed logical—but another reasonable hypothesis that the lack of available local recycling services would also make Company X participation more appealing to those concerned for the environment.

Seacat and Northrup (2010) used a previously validated information-motivation-behavioral skills model to reach a similar conclusion about curbside recycling behavior in two random community samples. Specifically, it was found that social support and feelings of competence are major factors in predicting pro-environmental behavior. In our survey, we measured the former directly, using the question “How supportive do you believe your organizational culture to be of participation in the Squad?” and measured feelings of confidence via multiple

metrics, such as ease of Company X website use and perceived level of knowledge of environmental issues.

### **4.1.3 Organizational Factors**

Tudor, Barr, and Gilg (2007) set out to examine how sustainable waste behavior is influenced by organizational structure and culture, using the National Health Service in Cornwall as a case study. Beginning with two theoretical considerations (individual characteristics and organizational characteristics) and the relationship between the two, Tudor et al. (2007) measured the environmental attitudes, beliefs, sociodemographic factors, and knowledge of environmental issues of the individuals. Additionally, they examined the structure, size, and culture of the departments within the National Health Service. The results suggest that the focus and structure of each department was a major factor in influencing sustainable waste behavior as were organizational culture and engagement. Furthermore, waste management behavior in the home appeared to strongly influence behavior at work.

The Tudor et al. study (2007) solidified our interest in measuring the organizational culture of collection sights across a few metrics, such as supportiveness and altruistic behavior. Furthermore, it led us to attribute more importance to distinguishing between types of collection sites, such as schools or churches. It was realized that it may very well be the case that a single type of collection site is overwhelmingly responsible for the total volume of waste collected, and so it would be maximally efficient to focus engagement strategies on this type.

## **4.2 Primary Interviews**

### **4.2.1 Methodology**

After creating a proposed framework of intrinsic motivating factors based on the literature review, the team conducted preliminary interviews with selected local Squad leaders to collect first-hand data on the nature and operations of Squads. This anecdotal information was used to further refine our hypotheses and inform the creation of survey questions.

Six Squad leaders were chosen from over 40 responses to an email inquiry of southeast Michigan Squad leaders. These leaders were chosen to represent a range of Squad location types, collection rates, and demographics. Squad leaders were each interviewed on-site at their respective Squad collection locations. Of these six Squads, four were elementary schools, one was a corporate workplace, and the final was a religious organization. The interviews sought to answer questions about the demographics, Squad supportiveness, operations, environmental awareness, motivations, and challenges of each Squad (see Figure 2 for a list of interview questions and consult the appendix for interview transcriptions). It is important to note that these questions served as a basic guideline for the interviews; any interesting tangents were followed-up with improvised questions.



1. I was wondering if we could start by having you tell us a little about your organization – how many people participate in your collection?
2. Great. Could you give us an estimate of their approximate age range (and average age), educational level, and income level? Are there more people of one gender than the other?
3. How do you think your level of participation in the Company X program compares with other organizations?
4. Do you consider the social environment of your organization to be supportive of participation?
5. Does the organization itself have goals that involve reducing environmental impact?
6. Would you say that participation in the program brings happiness or satisfaction to you, personally? What about to other participants?
7. Do you feel empowered by participating? Do you think other participants feel the same way?
8. Is participation in the program helping you or your organization accomplish a goal, such as waste reduction or community service?
9. How convenient do you find it to participate? Is participation within the organization set up in a way to maximize convenience?
10. Would you consider yourself to be informed about recycling and waste issues? Do you think members of your organization consider themselves informed about these issues?
11. Going off of that last question, do you feel that information about participation in the program is accessible enough?
12. How important to your organization is the 2-cent donation per item offered by Company X?
13. Do you believe that by participating in the program, your organization is ‘doing the right thing,’ in a moral sense? Would you consider this a major reason for participation?
14. Do you believe that participating in the program gives your organization a more positive public image? Do you think that the members of your organization feel that by helping in the program, they are bettering their social standing or public image?
15. Would you consider the environmental benefits of participation to be a major factor motivating your organization’s participation?
16. Would you consider the human benefit, such as better public health resulting from less landfill space, an important factor motivating your organization’s participation?
17. This next question might sound a little strange: Since you’ve started participating in the program, do you feel a sense of loyalty to Company X? Do you believe that you can trust Company X to handle waste properly?

Figure 2: List of questions asked at site visits

#### 4.2.2 Site Descriptions

**Elementary schools** Each of the elementary schools interviewed varied in size, income level, and Squad collection efficiency. School A, with approximately 420 students, possessed the most robust collection program of the six Squad locations. The school had a student-staffed Green Team supervised by teachers whose members spend recess time cleaning, organizing, and packaging collected items. The school participates in 14 Squads and also collects non-Squad items such as cardboard, electronics, and hearing aids. Many of the Squad items are

collected at the lunch hour, and parents can also drop off items in designated bins in the school. Students are very interested in participating in the Green Team, and member duties are tracked on a chart in the school's dedicated waste collection room. There seemed to be a lot of enthusiasm and momentum around collecting items for the school from both students and parents. The team interviewed a woman who was involved with the management of the school's Squad collection operations.

At school B, with approximately 475 students, the Squad collection program is run by the PTA to support the school's budget. Collection takes place at lunch, and is supplemented by parents' collection of items at home. A mother on the PTA who is involved with collection operations was interviewed at this location.

School C's collection program was the least robust. A mother who leads the Squad collection was interviewed, and the collection operations faced some barriers: teachers and students were not very engaged in the collection process, and collecting items was messy and sticky. The students collect the waste at lunch time, and then the mother takes the items home to wash and store them.

School D had a well-established collection system, which engaged several grade levels of students. Led by the teacher who was interviewed, students would wash and sort their own juice boxes at lunch assisted by teacher volunteers. Kindergarten students count the items collected; first graders learn about caring for others through collecting; second graders learn about caring for the environment.

**Corporate location** Collection site E is a corporate facility of an industrial manufacturing company; the collection is spearheaded by a female employee over the age of 50. The company has a small café lunch area which sells snacks, including chip bags. Chip bags are collected in designated cardboard boxes placed on top of trash cans in the lunch area, and the female employee periodically empties them and stores the chip bags at her desk until a critical mass is reached.

**Religious community organization** This Squad location, site F, is housed at a religious community organization with 27 staff members. This Squad is run by one of the staff members who is very passionate about collecting Squad items. His location participates in multiple Squads, and he is on the waitlist for several other Squads.

### 4.3 Interview Findings

The team realized at the time of the interviews that there would be self-selection bias among those who volunteered to spend time being interviewed. Furthermore, it is very possible that southeast Michigan Squad leaders differ from those of other regions in some way. As such, the team was careful not to generalize the results of our interviews as being representative of all Squad leaders.

Motivational factors for Squad participation encompassed a range of elements. The most prominent reasons stated were the environmental benefit and donation to the organization. All of the Squad leaders we interviewed mentioned these two factors, though money seemed to be the biggest driver for budget-constrained schools and the religious community organization. The curriculum/educational benefit was also a strong motivator in schools. It seems that students were generally interested in doing something good, and the environmental aspect of the program was tied into the curriculum at two of the four schools. The feeling of satisfaction obtained from doing good was also mentioned by all of the adults interviewed.

The operational structure of waste stream collection varied from passive collection boxes to a very elaborate Green Team at school A. The most common barriers to smooth-running Squad operations were the mess involved in collecting juice boxes. Several locations noted past problems with fruit flies while storing the items. Additionally, leaders of the low-performing Squads expressed interest in connecting with other Squad leaders to share stories and best practices and to connect with other Squads for which a location may be waitlisted.

At the corporate location, the Squad leader mentioned that the program is a mild driver of branded chip sales. She noted that some employees specifically purchase the brand that can be returned to Company X.

## 4.4 Squad Leader Personas

In order to better illustrate the types of people leading Squad locations, the team has developed sample personas by combining the typical characteristics and interview answers of the Squad leaders we interviewed.

### 4.4.1 Dena

Squad Type: School; Role: Leader

**School Demographic:** This includes 286 students (120 females, 166 males) in grades preK-5. There are 22 professional teaching staff members and appropriate staff to meet special needs.

**Key Fact:** 98.9% of parents participated in at least one conference during the school year.

#### Who is Dena?

- Mother of a student at the school
- Has never recycled
- Early 40's

She participates in the Company X program for the following reason:

“I was interested in recycling, and I heard some parents at another school talking about it. I decided to set it up at my son’s school because it seemed like a good fit”

### **Key Motivators**

- Doing something good for the environment and for the school (donations)
- Teaching her son about recycling and taking care of the environment

### **Collection Process**

“I collect at lunch. I try to get the lunch ladies and the janitor to help me out, but I try to be here everyday to help kids sort out the waste that can be sent to Company X. Primarily we send in the Capri Sun juice pouches because we get good money for those.”

“Though we’re signed up for 15 Squads, it’s really only possible due to time constraints and logistics to participate in two.”

“It’s just so busy here during the lunch period to collect. We have kid helpers, but we miss a lot of waste.”

**Interactions with Company X** For Dena, the interaction has all been really easy. She has only used the online system. At one point she found out she could print some Company X posters but hasn’t been able to find them. “I want an 11x14 poster that is better at explaining how to Company X than the poster I made”.

**Main Problems** “It’s really messy and sticky to clean and collect all the items. For instance, when we collect the juice pouches, I have to take the pouches home, wash them, take out the straws, and then sort them into the shipments to Company X.”

“I’m new to this and don’t really know what I’m doing. I’m essentially doing it on my own, and would really like to learn from other schools that are doing it better than we are”.

“I have a hard time managing student involvement. They only collect because I’m here asking them to and showing them how to do it.”

#### **4.4.2 Randy**

Squad Type: Business/Nonprofit; Role: Leader

#### **Who is Randy?**

- 35 years old
- IT Director for community organization

- Recycling “fanatic”
- One of 27 executive staff members

Randy participates in the Company X program for the following reason:

“I am a self-confessed recycling fanatic and I go to great lengths to recycle as many things as possible. Company X is just one part of my personal waste management system. I also have a BS in environmental policy. I try to recycle everything because it is the right thing to do. I spend about 4 hours a week sorting and collecting the recycling.”

### **Collection Process**

He collects himself and the staff brings in individual products. There was no recycling when he started 4 years ago. He started a recycling program at one office, and people were initially skeptical. Eventually the organization went to a full recycling program because there was a lot of interest. He thinks it has to be convenient for people to want to participate in recycling. He tries to make the Company X collection as easy as possible by collecting and sorting himself.

**Interactions with Company X** When it comes to loyalty to Company X, Randy says that they’ve been helpful on the phone, but response time via email has not been so good. Randy doesn’t have much loyalty to Company X. If a Michigan based company popped up, he would likely start working with them. “I don’t like that I’m shipping my trash a long way.”

### **Randy’s Suggestions for Company X**

- Provide Company X bins to collect waste.
- Enable better Squad management. He has been on a waitlist for several Squads (toothpaste, Elmer’s glue, and yoghurt containers). There should be fewer limitations on how many Squads that can be open.
- Provide local facilities so leaders can work together.
- There should be a way to share best practices. More communication between Squads would be great.
- What are the numbers and goals are of other Squads?
- Outreach material (videos, communications stuff) that talks about the mission would be useful. Knowing Company X’s objectives, where products are going. Company X should communicate the feel-good story that might motivate others to participate.

- Company X branding in-store could help a lot.
- He would like to be able to disseminate information to let people know how participation is happening in the community.

#### 4.4.3 Erin

Squad Type: School; Role: Assistant Leader

**School Demographic:** There are 422 students who attend this elementary school. It is a very high performing school with nearly 100% of students considered proficient at the grade level standards. Of the students, 99% have parent representation at parent-teacher conferences.

#### Who is Erin?

- Assistant to the Resource Coordinator
- Temporary Squad manager
- One of 38 teachers on school grounds
- Mid 20's

#### Collection Process

This is a very polished operation at a school with a very involved parent base and strong support from the administration. Collection efforts are coordinated through the “Green Team,” which is a team of students who are selected to be collectors. These students spend their recess and lunches collecting the waste streams, cleaning items that need to be cleaned, and sorting and packaging items to be mailed. These responsibilities were tracked on a sophisticated chart that outlined the duties and rotations of the students.

**Interactions with Company X** Erin expressed concern that Company X was not as responsive as she would like and cited an example of when a shipment was 3 pouches short and the school received no credit; Company X never responded to their inquiries. She also expressed concern that Company X only accepted brand-name packaging, and many students brought seemingly identical packaging that would not be accepted. Additionally she expressed mild frustration at the UPS labels; she claimed that the UPS truck that made routine deliveries and pickups was unable to take Company X's labels, and Erin needed to take the packages to a UPS center; however, Erin trusts Company X to handle the waste.

## 4.5 Survey Creation

Based on conversations with Company X, the literature review, and interviews with local Squad leaders, it was determined that the survey would be sent nation-wide to Squad leaders and would need to measure a variety of metrics, including the following:

- Level of participation, as measured by frequency of shipments and length of participation
- Squad characteristics and demographics, such as size and type of organization
- Measures of Squad culture, such as supportiveness and altruistic behavior
- A self-assessment of motivational factors for participation
- Methods employed by the collection site for organizing participation
- Measures of environmental awareness, perceived effectiveness, and access to other recycling services
- Measures of consumer behavior and interest, in order to directly inform Company X strategy
- Measures of belief in climate change and the importance of mitigation and adaptation among those participating in pro-environmental behavior in order to serve the current research interests of the sustainability community as a whole

The team experimented with two different survey services, SurveyMonkey and Qualtrics. Ultimately it was decided that Qualtrics offered the capacity and data export options more fitting to the project, so the University of Michigan license for this software was used<sup>2</sup>. After each draft of the survey was developed, a test copy of the survey was sent out to the team members and a selection of professors in order to gauge the ease of use and length of the survey as well as to detect any problems with data collection.

From an initial 55 questions, the survey was edited to a more manageable size of 30 questions. This seemed to be an optimal balance between gathering the information that was needed and creating a survey that would not be too long. The survey was completed by a majority of respondents, indicating that this was an appropriate length.

The team was advised to make each question optional. It was believed that this would increase the quality of the data as respondents would not select random or false answers for questions they weren't interested in answering. As a result, the survey was revised to include a "not sure" response on all of the questions.

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<sup>2</sup>One major implication of this decision was that the University would be the owners of any data collected; we would only be able to offer the client synthesized results rather than a raw data set, to which the client agreed.

One difficulty that was encountered during the survey development phase was related to whether or not the team wanted to measure a variable (for instance, concern for the environment) for an entire collection site or just for the respondent. The team believed that in most cases, the respondent would be the collection site organizer, and therefore, would most likely be the initiator of Squad participation; however, this individual would be rarely responsible for the majority of waste collection as a single individual.

In general the survey was designed to include questions that related to the organization or collection site placed before any questions that related to the identity of the respondent<sup>3</sup>.

1. Where is your primary Squad collection site?
  - (a) School
  - (b) Place of worship
  - (c) Business
  - (d) Nonprofit/Community organization
  - (e) Home
2. Approximately how many people in your organization contribute items to send to Company X?

Question #2 was used to account for any significant differences in participation based solely on collection site size. For instance, if an organization has 10,000 people contributing items, but only sends in 1,000 items per year, we would not want to classify this site as having high participation. Conversely, if only 1 to 10 people were participating, this would be a substantial volume. It could be found that the opposite was true, however; an environmental initiative could easily become “lost” in a large organization.

3. What is the average age of the people collecting items in your organization?
4. What is the gender mix of the people collecting items in your organization?
5. How would you best characterize the average annual household income of your Squad members?

Question #4, related to the gender mix of the organization, was a topic that had piqued the team’s interest. Based on the literature review and on the beliefs of the team’s advisors, it was expected that predominantly female groups would have higher levels of participation. Furthermore, the literature review suggested that higher income levels were correlated with more pro-environmental behavior; however, because of the financial incentives for waste collection offered by

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<sup>3</sup>We were advised that, in general, people are more alarmed or suspicious of personal questions when they are at the beginning of a survey rather than near the end.



Company X, the team was uncertain whether or not this trend would hold true or even be reversed.

At this point, the team attempted to measure the altruistic or biospheric value orientations of the organizations themselves by asking about volunteer activities:

6. How often does your organization volunteer in environmental initiatives, such as tree planting or highway cleanups?
7. How often does your organization volunteer in social initiatives, such as helping the homeless or being active in a Big Brother/Big Sister program?

By asking about actual activities performed, this measurement became more concrete and easier for the respondent to answer. If the team had asked, “Would you consider your organization to be altruistically oriented?” two main problems could have arisen: many respondents would not have understood the question, and those who did would nearly always answer in the affirmative, resulting in a lack of usable information.

Due to the anonymity of survey responses, there was no way to directly correlate a response with actual level of participation. In order to compensate for this, the team created a series of questions in order to gauge participation for a given respondent:

8. How many Squads (Drink Pouch Squad, Bottle and Can Squad, etc.) does your organization currently participate in?
9. How frequently does your organization send shipments to Company X?
10. How long has your organization been participating in Company X’s upcycling program?

The team considers “How frequently does your organization send shipments to Company X?” to be the more direct measurement of participation, and so it will be used to establish the most insightful correlations between participation and other metrics, such as gender, income level, or concern for the environment.

At this point, the survey focuses on measuring some of the factors suggested by the literature review. After the site visit interviews, the team was curious to see if Company X’s upcycling process was frequently being used to teach students (or other organization members) about the environment or waste management. If this was the case, the team wanted to be able to detect how turning the Squad collection process into an educational instrument affected the amount of participation. From the literature review, it was gathered that feelings of competence were an important factor in bringing about pro-environmental behavior, and so the team predicted that using collection as a teaching tool would increase participation:

11. Do you use Squad participation as a teaching tool within your organization?

Another important factor for motivating pro-environmental behavior was believed to be the supportiveness of the organizational culture. The team chose to measure this directly:

12. How supportive do you believe your organizational culture to be of participation in the Squad?

Our next question addressed both access to recycling services and feelings of competence with recycling. As mentioned in the literature review, the team was uncertain whether or not access to recycling services would have a positive or negative effect on participation (or no effect whatsoever). If a participant was concerned for the environment but did not have access to recycling services, Company X would offer them a way to act pro-environmentally, and so participation would likely higher if people did not have access to recycling services. We believed, however, that access to recycling services and regular use of these services would likely result in feelings of competence that could transfer to upcycling competency. For this reason, participation might be higher if people did have access to recycling services. If either of these hypotheses were true, it could be useful information for how Company X communicates about its services.

13. What types of waste does your organization (school, company, etc.) recycle? (Check all that apply)

- (a) Paper
- (b) Plastics
- (c) Metal
- (d) Glass
- (e) Compost
- (f) Bottles for deposit return
- (g) None
- (h) No access to recycling services

Next, the team sought to measure self-assessed motivating factors. For some factors (such as the monetary donation made by Company X either to the collection site or a charity) this may have been one of the few ways to make a measurement. For others, such as concern for the environment, we would be able to compare the self-assessed answers to the results of looking for correlation between other environmental concern questions and frequency of shipments.

Knowing how important participants believed the donation to be could have serious implications for Squad engagement strategy. If it was found to be one of the top motivating factors (which we hypothesized it would be), this would be a serious lever for participation that could be quickly manipulated. If not, it could be a great way to cut costs if necessary.

14. How important are the following factors in motivating your organization to collect waste for Company X?

- (a) Donation to your organization (or to a charity)
- (b) The sense of satisfaction derived from participation
- (c) Being part of a community activity
- (d) Being part of something new and innovative
- (e) Concern for the environment

The team was interested to see if there were any common strategies among successful groups, such that Company X could encourage groups to adopt these strategies. Using the methods of highly participating sites that were interviewed as a reference, the team developed the following:

14. Which of the following strategies is a part of your collecting group's culture? (Check all that apply.)
- (a) Meetings or teaching sessions with members
  - (b) Well-defined collecting processes
  - (c) Well-defined goals for regular collections
  - (d) A point person to answer any questions about collecting or participation
  - (e) A collection system with clearly delegated tasks and responsibilities
  - (f) Regular (at least once a week) opportunities to communicate with members

A major interest of the University of Michigan's School of Natural Resources and Environment is belief in climate change and the relative importance of climate change mitigation and adaptation to the population. In order to serve the University (as the major source of this project's funding), it was decided to take advantage of the rare opportunity to poll thousands of Americans already engaged in pro-environmental behavior. This was done with the hopes that this information could direct future research and communication strategies. As such, the following questions were included:

16. How knowledgeable do you consider yourself about environmental issues?
14. How concerned are you about each of the environmental problems listed below?
- (a) Local environmental problems
  - (b) Regional environmental problems
  - (c) Global environmental problems
18. Which of the following statements best represents your thoughts about climate change?

- (a) I do not think that climate change is currently occurring.
- (b) I think that climate change is probably occurring.
- (c) I think that climate change is definitely occurring.
- (d) I think that climate change might be occurring.
- (e) Not Sure
- (f) I am unfamiliar with what climate change is.

19. How important do you believe climate change mitigation (reducing emissions of greenhouse gases that cause climate change) is?

20. How important do you think climate change adaptation (preparing for the negative consequences of climate change) is?

Beyond measuring motivational factors, the survey also sought to provide useful strategy consultation to Company X, which was done through a series of questions at the end. Some of these questions were hoped to be useful in gathering data for potential brand partners as a measurement of Company X's effectiveness in increasing brand loyalty and influencing purchasing decisions:

23. How often do you buy brand-name products because of their potential to be upcycled with Company X?

25. Have you promoted or discussed Company X products with people outside your Squad?

Other questions sought to inform the services that Company X provides. These were largely based on the feedback received during the team's collection site visits in Michigan:

26. How easy or difficult is the Company X website to use?

27. How helpful would each of the following be in allowing your organization to collect more items for Company X?

- (a) Pre-printed posters
- (b) Company X branded collection containers
- (c) Tips on waste collection operations
- (d) Tips on increasing participation
- (e) Pre-printed shipping labels
- (f) On-site UPS collection
- (g) Personalized support or phone support

28. How interested would you be in connecting with other organizations participating in Company X Squads?

Finally, the survey sought to measure “demand” from current participants for expansion options that Company X could pursue:

29. If you could pick one brand that you would like Company X to partner with, which would it be?

30. What one material do you frequently throw away that you wish you could recycle?

At the time of survey development, the team did not consider including an “additional comments or concerns” field for the survey takers because of the thousands of expected responses. The data would simply be too difficult to parse within our given timeframe. In retrospect, this may have been a mistake. The team instead received many of these comments and concerns at the email address created for the survey, `CompanyX@umich.edu`. Because these emails were not anonymous, however, it was difficult to determine in what way this quantitative data could be used. Instead of risking the integrity of our study, we used the opinions expressed as starting points for asking questions for our visit to the Company X office following data collection. Ultimately, these questions played a major role in informing this project’s strategy recommendations.

## 5 Data Collection and Results

### 5.1 Key Observations

Of the approximately 72,000 emails sent, only 4,168 individuals took the survey over the course of five weeks. A reminder email was sent to the entire survey group after three weeks. Most individuals (83%) who began the survey completed it. There is inherent selection bias in this sample, and so inferences to the population at large cannot be made. When looking at the set of all Squad leaders, it is likely that those represented here are more engaged and invested in Company X than those who are not.

A solid majority (67%) of collection sites are located in schools. This composition changes dramatically after controlling for Squad member age. For example, the collection sites for the 30-45 year old segment are much more balanced.

Squads tend to be either quite small or quite large. Groups with 10 or fewer people make up the largest segment at 23%, followed by groups of 200-500 people at 18%. Large groups tend to have more frequent shipments. Groups with 10 or fewer people make up more than half (53%) of those who have yet to actually send any materials to Company X.

Groups that send in materials more than once a month are evenly distributed across the number of Squads for which they collect waste. This number drops off dramatically with less frequent shipments. In this case, the groups tend to converge to collecting for between one and four Squads.

## 5.2 Leadership Techniques

The techniques that Squad leaders use to keep their volunteers engaged are fairly consistent across site types, although there are noticeable differences. Very few have group meetings or well-defined collection goals.

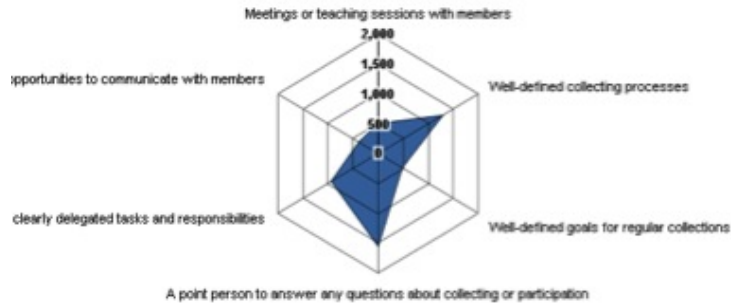


Figure 3: Organization techniques at school sites

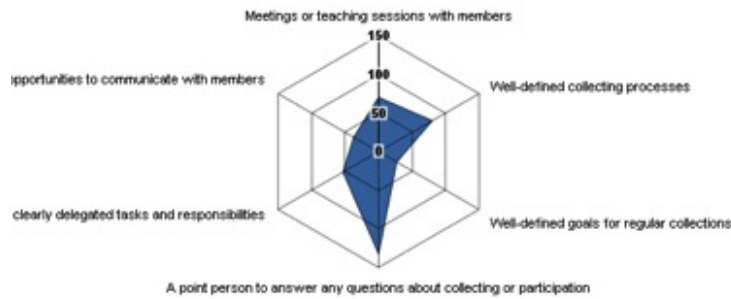


Figure 4: Organization techniques at nonprofit/community organization sites



Figure 5: Organization techniques at church/place of worship sites

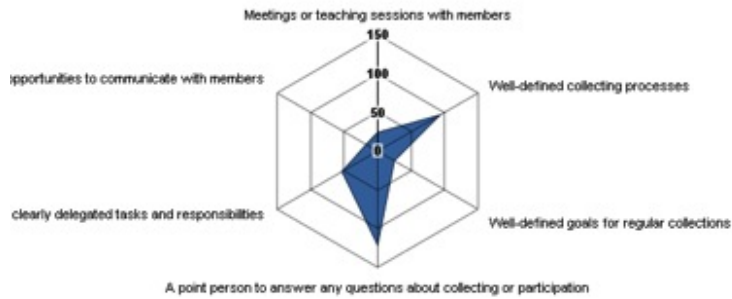


Figure 6: Organization techniques at business sites

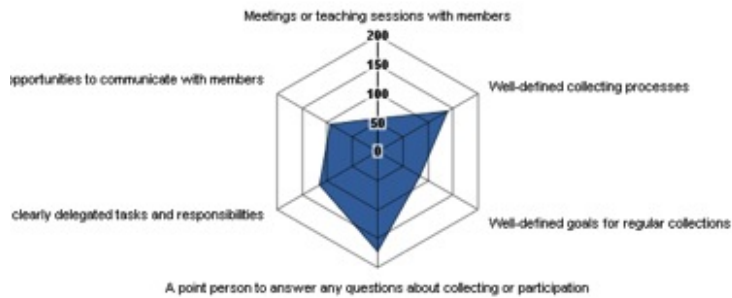


Figure 7: Organization techniques at home sites

### 5.3 Motivation

Overall, concern for the environment is the dominant motivating factor with donation a close second. These ratios remain fairly consistent across site types.

The results are highly skewed to the right.

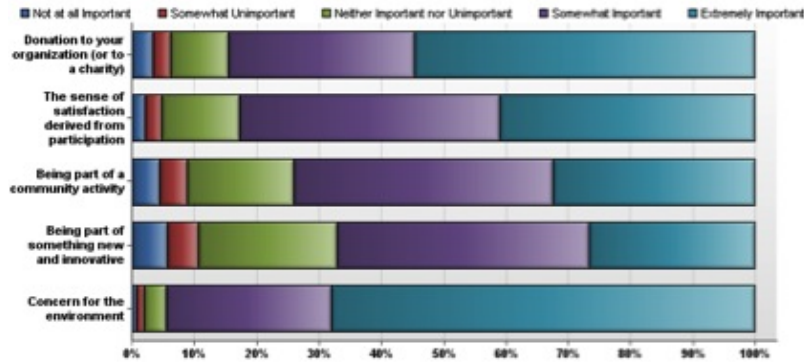


Figure 8: Motivational factors

## 5.4 Frequency of Shipments

Thirty-three percent of respondents send in materials every few months. These ratios remain fairly consistent across site types. When looking at non-school site types, however, 36% of respondents have never sent in anything at all.

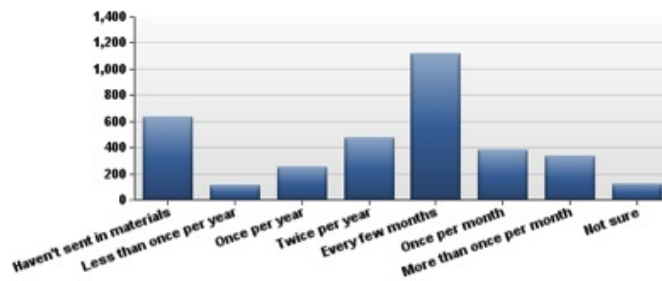


Figure 9: Shipment frequency

### 5.4.1 Climate Change

Seventy-nine percent of respondents believe climate change is probably or definitely occurring.



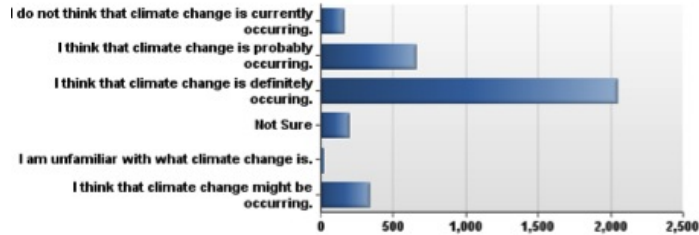


Figure 10: Climate change beliefs

## 6 Analysis

### 6.1 Analysis of Survey Data

Nearly all questions in this survey instrument are measuring categorical, rather than continuous, variables. Combined with the use of the “not sure” option, this presented serious challenges for a rigorous statistical analysis. This resulted in a data set that has captured actionable and interesting results at the cost of being able to create a rigorous predictive model of Squad behavior.

The analysis<sup>4</sup> can be broken up into three primary approaches: cross-tabular, bivariate regressions, and an iterative stepwise regression. Due to the nature of the dataset, the cross-tabular approach yields the most interesting and useful result as it does not require the “not sure” responses to be excised from the dataset. All other analysis was done with a much smaller subsample of the survey results that controlled for the “not sure” option. The bivariate regressions did not yield significant results. Scatterplots were created with “jiggled” data, and it is possible to see clouds of correlation in these plots. The stepwise regression model could only claim 24% accuracy at best.

The next several pages contain some of the key scatterplots generated by plotting responses to relevant questions against frequency of shipments and length of participation in the Squad waste collection program. These help to show where the highest and lowest performing collection sites stand in terms of demographics and beliefs.

#### 6.1.1 Type of Site

Here, the dominance of schools as collection sites is obvious. Worth noting is the concentration of home-based sites that have yet to send in materials.

<sup>4</sup>The data analysis for this paper was generated using Qualtrics Labs, Inc. software, Version 25102 of the Qualtrics Research Suite. Copyright © 2009 Qualtrics Labs, Inc. Qualtrics and all other Qualtrics Labs, Inc. product or service names are registered trademarks or trademarks of Qualtrics Labs, Inc., Provo, UT, USA. <http://www.qualtrics.com>

Additionally, there is a trend across site types to send in materials every few months. In the lower plot, it can be seen that businesses are growing as a collection site type.

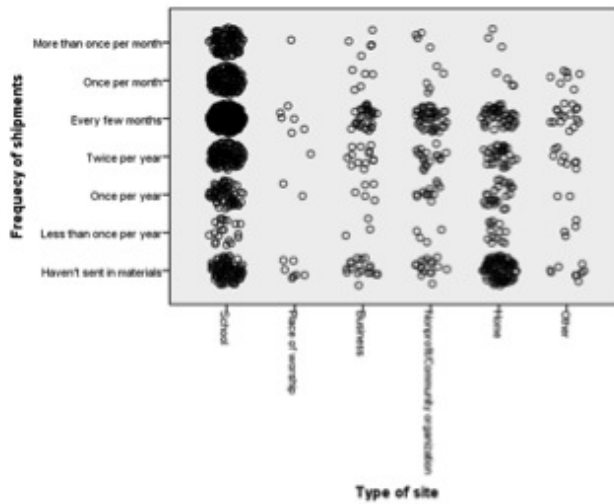


Figure 11: Site Type vs. Frequency of Shipments

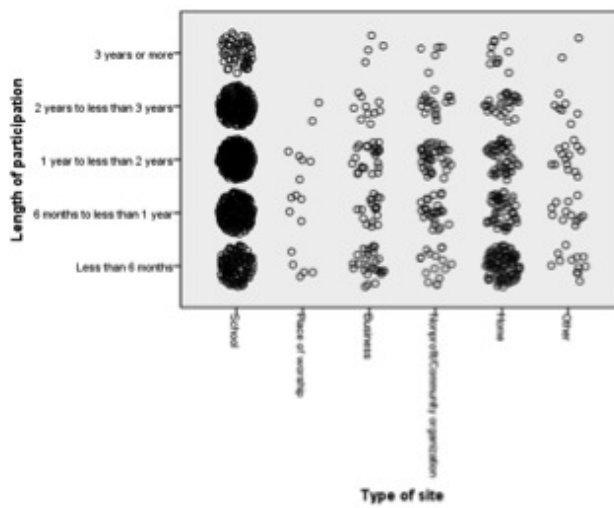


Figure 12: Site Type vs. Length of Participation

### 6.1.2 Squad Size

The two strongest concentrations of responses are the small sites from which materials haven't been sent and the large sites from which materials are sent every few months.

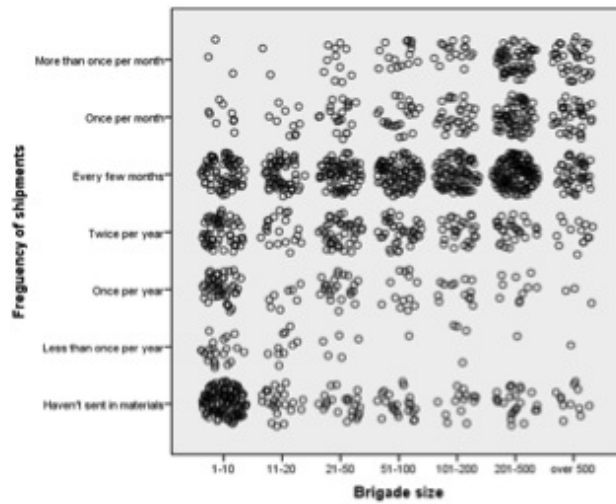


Figure 13: Squad Size vs. Frequency of Shipments

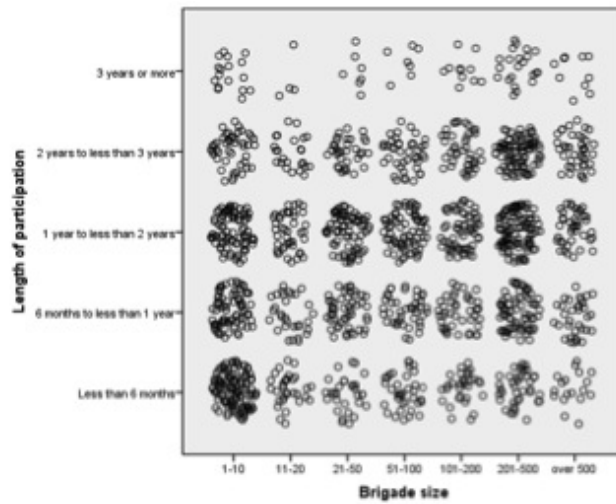


Figure 14: Squad Size vs. Length of Participation

### 6.1.3 Squad Age

Again, the dominance of schools (as represented by the 7-12 years old category) is obvious. More interesting is the concentration of 31-45 year olds who send in materials every few months, mapping nicely to the home collection site data seen earlier.

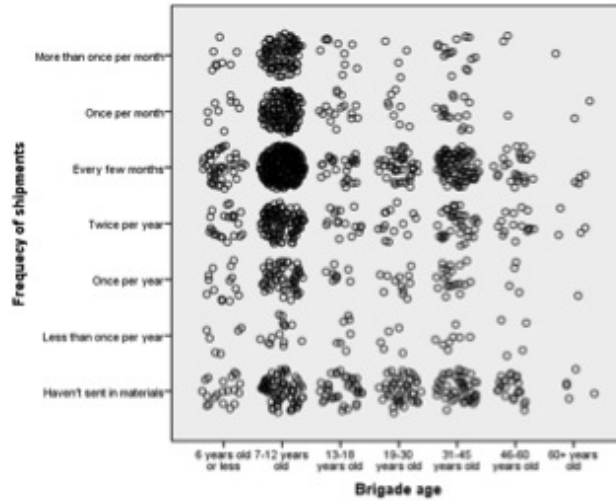


Figure 15: Squad Age vs. Frequency of Shipments

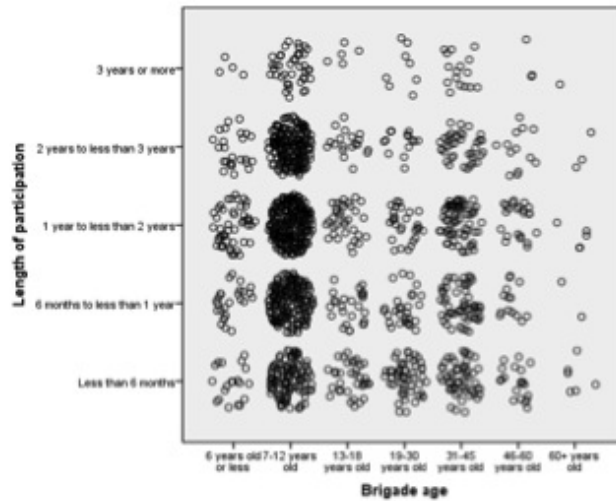


Figure 16: Squad Age vs. Length of Participation

### 6.1.4 Average Income

Most people were not sure of the average income of their volunteers. Judging by the density of the data plotted, most volunteers' incomes fall below \$75,000.

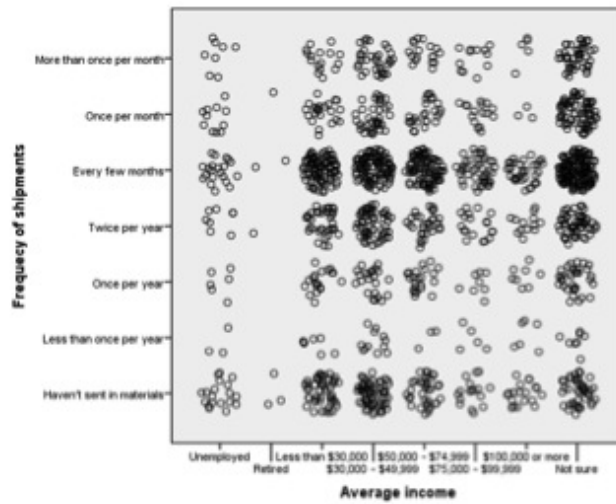


Figure 17: Average Income vs. Frequency of Shipments

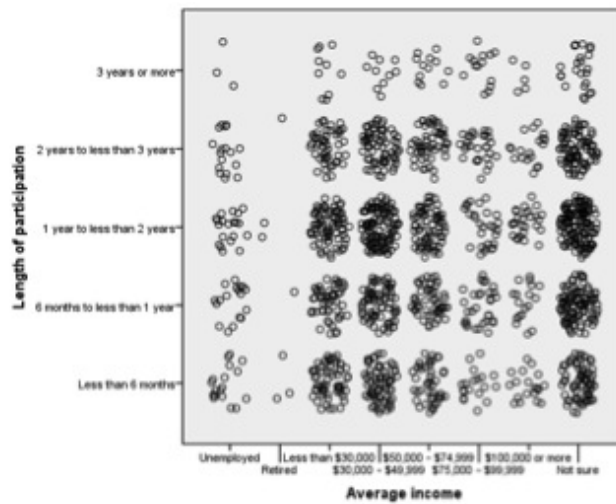


Figure 18: Average Income vs. Length of Participation

### 6.1.5 Environmental Volunteerism

There does not appear to be a very strong correlation between volunteerism and participation. Infrequent shipments correlate weakly with a lack of volunteerism.

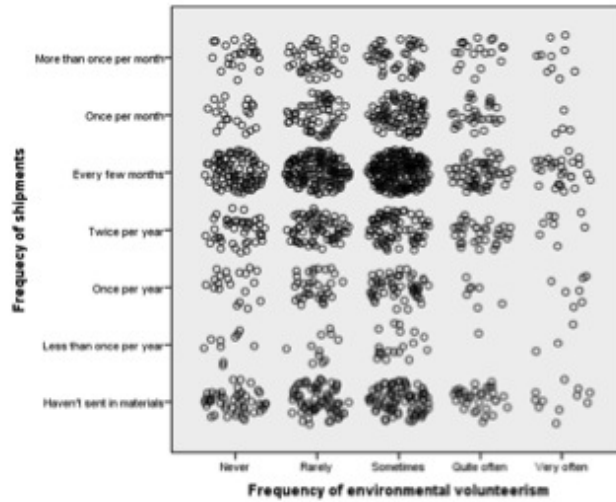


Figure 19: Frequency of Environmental Volunteerism vs. Frequency of Shipments

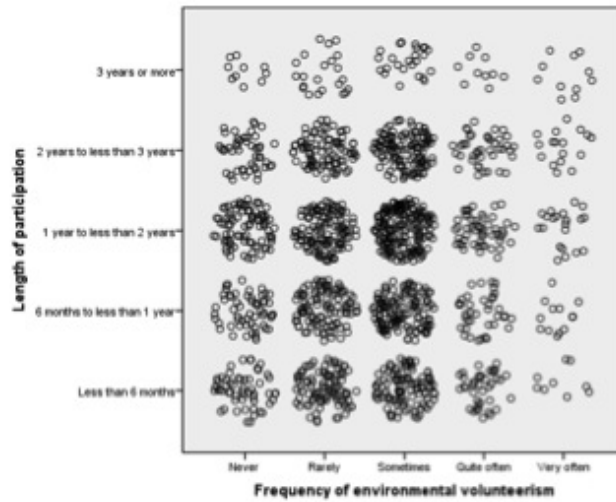


Figure 20: Frequency of Environmental Volunteerism vs. Length of Participation

### 6.1.6 Social Volunteerism

As with the plots above, there is no strong correlation between social volunteerism and participation.

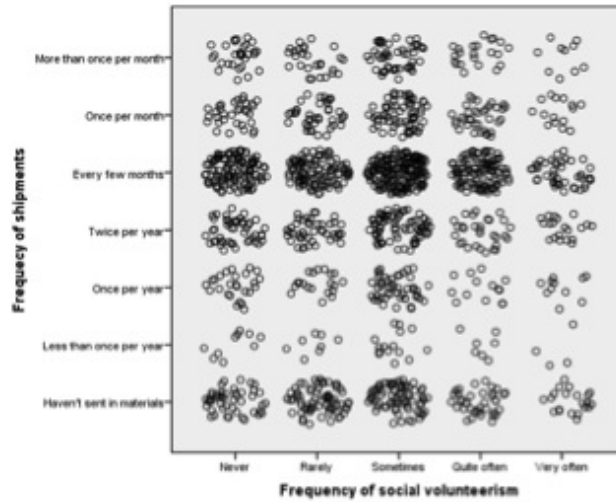


Figure 21: Frequency of Social Volunteerism vs. Frequency of Shipments

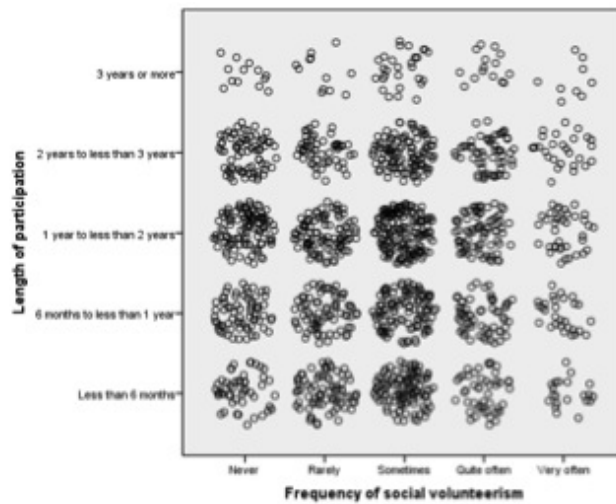


Figure 22: Frequency of Social Volunteerism vs. Length of Participation

### 6.1.7 Number of Squads

Interestingly, but perhaps unsurprisingly, there are very few collection sites that participate in a large number of Squads and from which materials are sent infrequently.

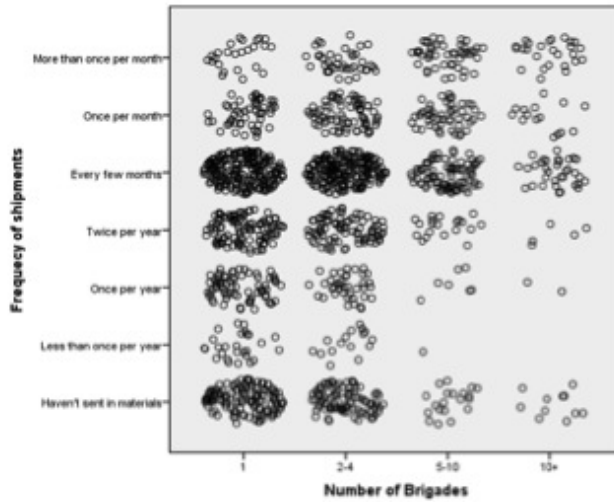


Figure 23: Number of Squads vs. Frequency of Shipments

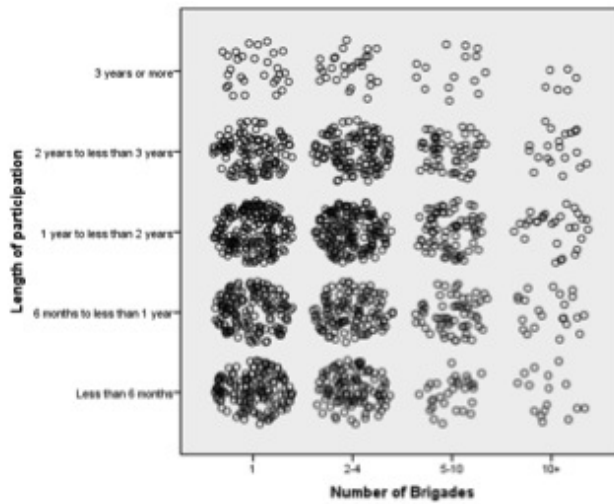


Figure 24: Number of Squads vs. Length of Participation



## 6.2 Analysis of Company X

### 6.2.1 Capabilities

Company X's ability to maintain its position within the market landscape, as a CPG-funded upcycling company, is contingent upon its ability to leverage its core capabilities in order to deliver value to customers. Currently, Company X has four core capabilities that support its business activities:

- Flexible organizational structure that supports ability to innovate
- Research and development that supports both product categories
- Public relations presence that supports Company X's place in industry
- Product and interior design that supports innovative use of upcycled materials

In order for Company X's current business model to succeed, a stronger focus on capabilities in customer service and client management will be essential. A more robust discussion of these capabilities will be detailed in the recommendations section. Additionally, Company X could benefit from expanded capabilities in efficient operations processes.

Figure 25 provides an analysis of Company X's strengths, weaknesses, opportunities, and threats.

Strengths:

- Captive and large audience of Squad members
- Existing relationships w/ CPGs
- Innovative design team
- Flexible entrepreneurial culture
- Good at generating PR for free
- Different way of thinking about waste (as an asset)
- Large quantity of free seasonal labor (interns)
- EOE

Opportunities:

- Trend toward greater public environmental awareness—can ride this to capture interest in Squads
- Expand into different kinds of collection sites (diff demographics—e.g. target men, sporting events, retail)
- Leveraging X's design capabilities in new ways
- Wide range of brand partners: X could take on a different or additional role with these partners
- Leverage Squads to advocate for policy changes
- Work with other departments of CPG partners (i.e. supply chain, CSR)

Weaknesses:

- Upcycled products don't address the root problem
- Inefficient operations
- Low profit margins
- Self-limiting business model
- Employees have many responsibilities
- Work solely with marketing departments of CPG's

Threats:

- Green guerilla marketing efforts of branding/PR firms
- Waste management/recycling companies entering this space
- CPGs creating truly sustainable/cradle-to-cradle products
- Consumer behavior: shift in consumer mindset /preferences away from sustainability

Figure 25: SWOT Analysis

## 6.3 Competitive Analysis

### 6.3.1 Supplier Power

The competitive landscape surrounding Company X provides for a somewhat daunting industry to enter. Company X's suppliers have limited bargaining power. There are a large number of CPG consumers or Squads, which minimizes their individual bargaining power. There is also a low concentration of Squads with minimal opportunities for members to communicate with each other. From Company X's point of view there is no real cost to changing from Squad to Squad to meet collection quotas. Retail collection sites, although they are not Company X's primary suppliers, have moderate supplier power because they could feasibly set up collection sites themselves. Manufacturers of pre-consumer waste have minimal bargaining power because they are not a core part of the current business model and provide these supplies to Company X voluntarily.

### **6.3.2 Buyer Power**

Company X's CPG partners have a high amount of bargaining power as a high concentration of revenue comes from CPG partners. Additionally, the switching cost for the buyer is minimal, and CPG companies do not have a great deal of brand identity tied to Company X. Company X's service is not integral to the CPG business model as these companies do not generally consider post-consumer disposal as part of their product offering. If companies were to consider the disposal process as part of their product offering, then their bargaining power over Company X could be lower.

### **6.3.3 Industry Rivalry: Direct Competitors**

Company X has created a "blue ocean" with its most recent business model in that the company has created an industry that didn't previously exist (Kim, 2005). Company X has a few direct competitors, such as Preserve, that collect post-consumer waste for upcycling purposes. Preserve has a similar business model to Company X, but it is much more focused in terms of products used for upcycling. Preserve poses a moderate threat to Company X as it could encroach on the company's business model if it expanded beyond its yoghurt cup and used toothbrush collection. Recycling companies would also pose a moderate threat to Company X if they were to expand from traditional recycling materials to the waste streams that Company X currently collects.

### **6.3.4 Threat of New Entrants: Indirect Competitors**

There are also a few indirect competitors that could pose a threat to Company X's current business. Company X provides a waste diversion service, which exists in somewhat uncharted territory beyond the boundaries of recycling and waste collection companies. Waste diversion is described as the process of collecting, storing, reusing, or upcycling waste for the purposes of keeping the waste away from a landfill and the view of brand loyal consumers. If CPG companies were to begin to collect their own post-consumer waste or creating products that are compostable, they could pose a threat to Company X, but the nature of this threat is relatively low level. Retailers could also potentially launch their own collection sites but this is also a relatively low level threat. Finally, upcycled waste suppliers could become more efficient than Company X at collecting waste streams that are currently considered unrecyclable. This threat is also relatively low level.

### **6.3.5 Threat of Substitutes**

By diverting post-consumer waste from landfills, Company X helps CPG companies keep the negative advertising on empty branded containers away from the customer's view, which in turn allows these companies to position their brands as eco-friendly and consumption conscious. In summation, Company X provides the following value propositions to CPG companies:

- Avoid negative advertising
- Boost Customer Engagement
- Position brand as eco-friendly
- Use Squads to make CSR claims

Once Company X collects waste from Squad members (CPG company’s customers), it sells downcycled materials to manufacturers that convert these raw materials to new products. Given the current competitive landscape, Company X’s ability to deliver on its value propositions could be affected by substitutes provided by other companies. Chart 4a provides a summary of the competing companies that provide potential product substitutes to Company X. The threat of these substitutes is relatively low given current market conditions, but their threat could increase drastically if market conditions were to create demand for waste diversion from landfills.

## 7 Recommendations

Given the competitive landscape surrounding Company X and the nature of its current business model, three categories of recommendations will be discussed. The first category discusses ways that Company X can grow productivity among current Squad participants based on data collected from Squad member surveys and interviews. If the recommendations in category one are implemented at Company X and the company is able to maintain profitability, the second category of recommendations discusses ways in which Company X can acquire more Squads. Finally, the third category of recommendations presents breakthrough ideas that Company X could consider if the limitations of its business model, as previously discussed, hinder the company’s ability to achieve its long-term strategic goal of diverting all waste streams from landfills.

### 7.1 Ways to Grow Productivity

Company X estimates \$750,000-1,000,000 in revenue could be raised by maximizing existing Squad participation by activating dormant collection locations and increasing the productivity of already active locations (Smith, 2011). As such, this was a major focus of the project as a whole, primarily addressed through site visits and the survey. The team began by reviewing the existing academic literature on motivations for pro-environmental behavior, both among individuals and within organizations. They were then able to apply the findings of academic studies in developing questions for the site interviews in which the team spent time talking with members at Michigan collection sites (such as homes, schools, and businesses) about their collection process and overall experience with Company X. Using the insights gained from these interviews, the team crafted a thirty-question survey that was distributed online to Squad leaders across the United States. Over four thousand survey responses (and

30 emails of feedback) were received, and these have been used to inform the following recommendations for increasing Squad participation among registered collection sites.

### **7.1.1 Customer Service**

A common theme in both the Squad member survey responses and feedback emails related to Squad leaders' struggle with some aspect of the collection process and their inability to receive personalized help from the Company X customer support team. Common areas of difficulty included issues with the website, confusion about the waste submission process, concern that their location did not receive credit for submitted waste, or concern that they never received supplies from Company X. Many respondents reported that they had been collecting waste but were unable to send it to Company X.

Currently, Company X only employs two dedicated customer support employees to serve many thousands of Squad locations. The team believes that expanding this department and focusing on customer service to allow for better communication with troubled Squad leaders will quickly eliminate a bottleneck in the Squad system and increase participation results.

### **7.1.2 Sharing Best Practices**

Through both site visits and survey responses, it was found that the Squad locations had a diverse set of practices for collection, some of which worked better than others.

Because many visitors to the Company X website would be below adult age, any sort of forum configuration would require constant moderation. As such, the team does not consider this to be a sensible approach to sharing practices. Instead, it is believed that Company X should reach out to leaders at top-performing collection sites and ask them to write a paragraph about their collection operations. These would be (a) posted on the Company X website and (b) sent in a Company X newsletter. One of these could be sent out in each newsletter cycle.

An alternate approach would be an "Ask the Company X Community" process, in which a Squad leader could submit a question not to be answered by the Company X support team but rather to be fielded to the nationwide Squad location leaders in a newsletter.

### **7.1.3 Sharing Demographic Information with CPG Companies**

CPG companies can gain added value via increased return rates, which presumably would build positive brand value. In order to increase the submission of waste by Squad members, information about participation with Company X that is placed by CPG companies on packaging or in advertisements should be more highly targeted. Specifically, Company X-related information should be customized for each Squad according to the demographics of Squad members

who are high participators. For instance, it was found that among adults, females were significantly more participatory in waste collection and submission than were males (though this does not hold true for school-aged children).

Suppose, for the sake of example, that Clif Bars are consumed primarily by males. Does this mean that Company X-related messaging on the Clif Bar website should be directed at males? This is not necessarily so. It may be the case that while more males are consuming Clif Bars, females may be more involved in collecting and submitting the packaging to Company X. As mentioned previously, adult women were more likely than adult men to be involved in waste collection in general. More specific research should be done for individual Squads, and this information should be shared with CPGs in order to optimize collection.

#### **7.1.4 Identify the optimum number of items collected to support CPG partner**

For a CPG company, much of the value derived from Company X's services comes from consumer engagement, building of trust, and product differentiation; however, because the CPG must pay a per-item fee, it is often not within the CPG's budget to allow for limitless collection. As such, the number of collection sites allowed to sign up is capped at a certain level. Individuals who have either purchased products based upon the ability to upcycle them, or those who have begun collecting waste before registering with Company X, may feel quite frustrated when they are put on a waitlist to join a Squad. This may generate resentment towards Company X or the CPG company to the extent that it effectively cancels out the goodwill generated by the others who were allowed to register collection sites.

Although the team did not attempt to collect direct email feedback from survey respondents, numerous emails were received containing requests or complaints. Many of these contain language that directly associates CPG brands with issues a Squad member has experienced with the upcycling process, such as the following<sup>5</sup>:

“I shipped opened and cleaned Capri Sun pouches to the recycle center and by my calculations, I had enough to ship and be credited for the shipment. I was shocked when I received no credit for the last shipment. [...] Since my school does this to try to raise money to purchase books, each shipment means a great deal to us.”

or

“My school is very low income and I depend on the monies raised by recycling to purchase books for the library for my students. The last batch of capri suns [sic] I sent in were not counted towards my balance.”

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<sup>5</sup>Note that these selections are not intended to illustrate problems related to waitlists but were rather chosen as examples of language that includes CPG brand names within complaints.

or

“I got the Squad survey, but I have never been able to get my church into a Squad. I have tried several times and been on a Stonyfield yogurt waiting list for over a year.”

These selections suggest that any issues that arise in Squad participation may be associated with the CPG brand in the minds of the Squad members. Because it is possible that resentment as a result of being waitlisted could be associated with CPG brands, it is imperative that the negative value resulting from the cap be carefully compared to the costs of increasing the cap. The team believes there is an optimal collection level such that the marketing value of Company X participation is highest per dollar of variable collection fee for any given brand, factoring in the negative implications of having to waitlist collection sites after the cap has been reached. More research should be done to identify this optimal level and factors that may cause it to vary between Squads.

#### **7.1.5 Other Services**

As part of the survey, the team asked Squad leaders to select from a list the services that Company X could provide that would be most helpful to them. Pre-printed shipping labels were rated as the most helpful, primarily due to difficulty with using the Company X website. Company X branded collection containers and on-site UPS collection were rated the second and third most helpful, respectively. Due to the costs of these services, it may only make sense to offer these services to very large collection sites within Squads that have yet to reach their collection limit and choose to opt-in to be provided with these.

## **7.2 Ways to Grow Number of Collection Sites**

Regardless of the problems related to capping the number of collection sites allotted to any particular Squad, growing the number of collection sites is core to the Company X's long-term strategy. The team believes there are three primary paths to adding a significant number of additional collection sites: greater focus on environmentalists, finding analogous locations to schools, and increasing demographic diversity.

### **7.2.1 Enhance Environmental Targeting**

The survey research showed that 68% of collection site leaders cited “concern for the environment” as “extremely important” while only 54% cited “donation to your organization” as “extremely important.” While the donation is a close second relative to the other choices of motivating factors, environmental concern is at the top. Focusing on starting collection sites in geographic locations with a higher popular concern for the environment could be fruitful. For example, a collection site at an outdoor supply store, climbing gym, parks and recreation office, or natural food store would likely be a much stronger site than one at a

less environmentally oriented business or office. Collection bins for a Squad such as Clif Bar could be located at trailheads in parks or even more strategically located at specific parks with a strong rock climbing culture, such as Red River Gorge in Tennessee. Combined with recommendation 2B below, setting up highly organized collection sites in the offices of major environmental NGOs (i.e. Sierra Club, Natural Resource Defense Council, World Wildlife Fund, etc.) could capitalize on the inherent environmental mindset of their employees.

### **7.2.2 Apply School Success to Other Site Types**

There is no doubt that much of Company X's current success to date is owed to parents of schoolchildren buying Capri-Sun packaged juice drinks. Schools make up nearly 70% of all active collection sites, dwarfing businesses, religious groups, and community organizations combined. There is clearly some set of factors that allow schools to be such potent collection sites for Company X. By identifying these factors, lessons learned from school-based sites could be applied in other circumstances.

Schools are very different from the other categories of collection sites due to one primary factor—homogeneity of collectors. A school has a large number of kids with a similar culture of consumer packaged goods. These consumers are all in the same place, with a strong hierarchy of respect and authority, five full days a week. This makes a culture of collection much easier to establish and maintain.

Schools are not the only locations that possess these qualities; however, these analogous sites would need to be actively recruited in ways that Company X has not yet explored. Business campuses, apartment complexes, college cafeterias, and even prisons share many of the same qualities that help school-based collection sites be as successful as they are. These analogous sites, however, would require the collection process to be administered in more of a top-down fashion by the host organizations than the bottom-up volunteers registering on the Internet. The benefits, especially in a setting in which the packaged goods are sold on site to be consumed on site, such as a business campus cafeteria, would likely be worth Company X's additional administrative overhead.

### **7.2.3 Demographic Diversity**

As mentioned earlier, among collection sites where Squad members are between 31-45 years old, 63% of volunteers are female while only 7% are male. This can be seen as an opportunity to actively develop male-oriented collection sites, especially in the middle age demographics. One possible approach to this would be a campaign based around chip and snack consumption while watching sports. The donations could go toward a charity dedicated to supporting athletics in underserved communities or to any high visibility non-profit organization.



## 7.3 Think Big

It is important that Company X begins to think big about its business model. Currently the company derives the majority of its income from CPG companies with 40

This is a risky position for the company; the company's revenue stream could easily be compromised if the one or two biggest partners were to discontinue participation. Granted, there are contractual agreements that attempt to mitigate this type of risk; however, they do not guarantee that a brand partner will continue its partnership with Company X.

Furthermore, Company X grants exclusive agreements in brand categories, meaning that Company X can only be partnered with one juice pouch CPG company at a time. This severely limits the company's ability to grow revenue within categories, since all revenue in a particular category derives from only one partner. The addition of this stipulation to contracts compounds the riskiness of partnership from Company X's perspective, since there is no revenue diversification within categories.

Lastly, profit margins on these agreements are slim, as low as 5% in some Squads. Currently, margins cannot support a business model that is focused solely on processing raw materials created from the Squad submitted waste. It is the agreements with the CPGs that allow the company to operate profitably and continue to upcycle waste. At some point in the future this may change, which will allow Company X to leverage its core capabilities (pertaining to Squad recruitment, waste collection, and continuous upcycling innovation) to grow revenue and expand its upcycling operation. Until then, and as long as the company operates using its current business model, the organization will have to continue working in concert with CPG companies to maximize revenues and grow business.

Simply, Company X's current business model is severely limited by the number of CPG partners that the company can build relationships with and engage in Squad collection. The company's revenues are tied to the marketing budgets of the consumer packaged goods companies whose waste it is trying to divert from the landfill for upcycling. This creates an inherent tension between the goal of Company X's business, to eliminate waste, and the CPG's goal, to market and sell more products that are packaged in waste. In a sense, Company X helps these companies achieve the goal of selling, which in turn creates more waste.

In order to hedge for the long term and diversify revenue while remaining true to the company's ethos, the remainder of this section will propose some big ideas that have the potential to leverage Company X's strengths to diversity revenues and provide for long term growth.

### 7.3.1 Design for Upcycle

Company X has a capable and creative design team that is tasked with complex, quick turnaround design projects to create a wide range of products. Over time,

the company has become a design leader, perhaps the pre-eminent company with this skill set, through the creation of new products with upcycled materials. This has become a core skill that should be leveraged to further serve the company's mission; thus, with the distinct expertise of the design team, the organization should engage current partners to design *for* upcycle. This would serve the company and grow revenues in a couple of ways:

- Design for upcycle products that are developed with its brand partners would make the products substantially easier to upcycle when they return to Company X. This would reduce upcycling costs and increase margins on the sale of the raw materials.
- Partnering with current CPG partners to redesign aspects of packaging would strengthen current relationships with CPG's and provide an additional upsell that benefits Company X on the front and the back end.
- Company X could then begin to market their design services and expertise to other companies within the same category, thus, diversifying revenues within categories and mitigating Company X's current vulnerability.

### **7.3.2 Partner with Retailers**

The vast majority of the waste products that Company X upcycles are sold in retail stores such as Wal-Mart, Target, and grocery stores. Retailers are in the business of getting customers in their stores as often as possible because their stores are strategically designed to entice consumers to buy more than intended. Having a Company X collection area, receptacle, or something similar at a retail location would bring consumers back into the store to drop off the waste products that Company X upcycles. This would serve a number of purposes:

- The retailer would win by bringing customers back to their stores.
- The retailer could also build a positive CSR story out of this strategy.
- CPG companies would benefit from the customer's return as well since a customer's presence is a prerequisite to them buying products.
- Company X would be able to centralize collection and aggregate products into larger shipments
- Terracycle could negotiate with retailers to make an additional donation per unit or pound of waste collected that could be given to a local charity organization.

There are, of course, caveats to a strategy like this and there are numerous hurdles, but it is in Company X's best interest to maximize collection and reduce costs by receiving fewer shipments while also diversifying its revenue stream.

### **7.3.3 Municipalities and Waste Management**

It costs money for municipalities to dispose of trash. The city has to ensure that there is landfill space nearby and that there are workers or a contractor to collect and dispose of trash for its respective citizenry. Any reduction in the amount of landfill space that is consumed per person is a cost savings to the municipality; therefore, it is in a city's best interest to reduce waste. It is unrealistic to think that a citizen will cease to consume and put his or her trash on the curb; however, Company X provides waste solutions for a number of items that were previously considered unrecyclable. If Company X were able to create waste solutions for certain waste streams in cities, the company would be able to bid on lucrative contracts as long as it could be competitive with waste management contractors.

There is another option to potentially partner with waste management organizations whose managers or officers are interested in maximizing revenues and conserving landfill space by recycling and minimizing the waste material that they have to manage into perpetuity. Company X has solutions for the products that fill landfills and could likely achieve greater economies of scale by increasing the total waste that can be converted to raw materials. The company would no longer be operating a capital intensive, multi-location, individual mailing model, but would instead be diverting directly from the landfill, resulting in a tangible amount of waste reduction.

This is an ambitious strategy and one that would drastically change Company X's business model; however, it should be explored. Initially, it would make sense to engage a city to do a pilot study and continue scaling up from there if the strategy were considered viable.

### **7.3.4 Close the loop and partner with manufacturing companies to design new products**

Company X has become a waste solution expert. When the company begins to collect any new waste stream, it is able to design a solution with that waste. It could be as simple as a kitsch bag emblazoned with logos to a more technical waste to pellet to product type of solution. With this expertise, Company X could actively engage companies that are looking to design products with differentiated materials. Consider Patagonia's move to a 100% PET bottle for its fleece. What if Company X partnered with Patagonia (or a competitor to Patagonia) to reprocess a waste stream to provide the raw materials for a new jacket or shirt? This could be done with any number of product manufacturers to differentiate a company's brand and create an impressive story. "Your shirt was a bag of chips"...or something like this. Creating a partnership shifts Company X from commodity sales of raw materials to more of a wholesaler, increasing profit margin and connecting the company with its upcycling roots.

### 7.3.5 Hybrid Business Model

Company X has an inherent focus on social good. Currently, the company makes donations to nonprofits by engaging in their core business activities. In order to diversify revenues, Company X could begin exploring hybrid business models whereby, the company becomes a blend of for profit and nonprofit, allowing the company to raise money from foundations, environmental organizations, private donors, and government agencies (Boyd, 2009). This could fuel research and development and expand the company's social impact.

## 8 Conclusion and Synthesis

Our project initially set out to maximize the shipments of waste from collection sites to Company X in order to increase the total amount of waste that is upcycled. This was to be accomplished through a literature review, site interviews, and an online survey that sought to measure which factors motivated trash collection for Squad members. This process was successfully completed by the end of the summer, 2011; however, during the process of our research, the team came to realize that merely manipulating the volume of trash collected was insufficient for accomplishing Company X's long-term vision of providing a solution for all non-recyclable wastestreams and also did not address potential problems with the sustainability of the company's business model. That is to say, the team came to believe that structural changes were required in order to move the system (namely, Company X's waste upcycling process) towards its goals.

After careful consideration of the Company X business model, the team concluded that the company's reliance on the marketing budgets of CPG companies and its accompanying variable fee for trash collection could undermine the sustainability of the company itself. If a major customer of Company X dropped out due to budgetary constraints, the impact of this loss on Company X could be devastating. Furthermore, the variable fee charged to CPG companies for collection may decrease incentive for the companies to encourage their customers to send in waste. The system employed by Company X needs to be restructured in order to address these issues; manipulating a single variable (volume of trash collected by Squads) is not enough to ensure sustainability and to move the company towards its goals. As a result, a second group of recommendations was crafted by the team to address foreseeable issues with the company's business model, and to suggest solutions to be explored in the future.

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