

**TEXTILE WASTE RESOURCE RECOVERY: A CASE STUDY OF NEW YORK
STATE'S TEXTILE RECYCLING SYSTEM**

**A Thesis
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ABSTRACT

Growing amounts of textiles waste in landfills have become a concern for many. This study looked into the existing textile recycling system in New York State that performs the recovery, reuse and recycling of textiles, and provides alternatives to landfill disposal. The information pursued in this research highlights the system that brings together diverse stakeholders who work individually and together to recover apparel and textile waste in efforts to recuperate economic value and reduce the environmental impacts of landfill disposal of these materials.

This study highlights systemic efficiencies and inefficiencies in textile waste recovery and recycling efforts that can assist in improving diversion efforts and increasing both input and output to the system, in order to reduce textile waste in landfills. Because waste of all kinds is produced in communities locally, the research questions and answers sought to better understand how textiles are processed within the textile recycling system on local and regional levels. Another objective was to understand if and how the United States could become more accountable for the textile waste it produces and decrease dependency on foreign exports of second hand clothing and other textile waste. New York State has a high population, limited landfill space and is home to one of the world's major fashion capitals, New York City, making it a unique region for a case study on its textile recycling system.

Research questions were explored and answered through a mixed methodological research design that combined primary qualitative and quantitative data with secondary data. Primary data was gathered from consumers through an exploratory consumer survey on textile disposal behaviors and from interviews with key informants from municipal recycling management, the textile recycling industry, the fashion industry and higher education. Secondary

data was reviewed both during the literature review and the data analysis process to triangulate results while answering the research questions. Results from this research indicated that in order to effectively improve landfill diversion of textile waste consumer education and increased participation from the fashion industry are necessary for success. Recommendations for increasing system output are also explored.

BIOGRAPHICAL SKETCH

Autumn S. Newell studied Fashion Design at the Fashion Institute of Technology in New York City and then went on to receive a Bachelor of Science degree in Business and Managerial Economics from SUNY Empire State College. She is a lifelong seamstress, fashion enthusiast and advocate for social justice, sustainability, community development and youth mentoring. She also has a passion for nature and the outdoors and has been a champion of eco-fashion and reuse for the past decade.

She approached her graduate studies on textile waste at Cornell University from a place of curiosity as she worked to answer research questions around the disposal of clothing and other textiles in the United States. This curiosity began eight years ago when she opened an eco-fashion boutique, where she stocked a variety of second-hand and vintage clothing to encourage reuse as a form of sustainable consumerism for consumers. During this time she worked to understand where second-hand clothing ended up and how to tap into the somewhat clandestine system that handled it. This sparked her interest in the greater subject of textile waste as a sustainability concern. After deciding to close her store she then went on to run a fashion design apprentice program for youth that strived to cultivate environmental stewardship and career exploration among teens through their interest in fashion. The program was run at SewGreen, a non-profit textile and sewing supply donation organization that processed textile waste to support reuse, textile landfill diversion and community education.

Autumn's experiences have given her great context for understanding the complex obstacles and opportunities involved with managing clothing and textile waste. She approached this thesis research not only as a graduate student researcher, but also as an entrepreneur, second-

hand shopper and a citizen concerned with modern issues around consumption, models of planned obsolescence, environmental degradation, social justice, equality and climate change. Through the study of textile waste, she sees an opportunities to question many of the wasteful “business as usual” practices of the twenty-first century consumer economy, while searching for solutions that can move consumers and the textile, apparel and fashion industries towards more sustainable practices.

This work is dedicated to my parents, Frances Welch and Ivan Newell,
to my best friend and partner in life, Ishka J. Alpern and to our son, Otis.

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Chapter 1

Introduction

Clothing on the body is a tool that communicates identity, values, beliefs, social statuses and aspirations, while affording protection and movement through different environments, physical climates and group structures. The apparel industry faces new challenges with increasing scrutiny for its environmental and social impacts. Although apparel serves an important function in society, like many products designed for consumption and use, there is an end of life disposal process that is inevitable.

Examining textile waste provides an opportunity to observe the many wasteful behaviors of both apparel consumers and the fashion industry alike that have become acceptable practice. When exploring the issues of waste, one must consider how the materials and products came to be in the waste stream. Increased consumer culture has both dumbed-down traditional culture and created little true human satisfaction (Schor, 1999). The demands to produce and consume apparel products cheaper and faster than ever before have contributed to a decline in the longevity of the lifecycle of clothing, as well as the relationships that people have with it. The use of traditional tailors and seamstresses—once commonly used to improve garment fit and satisfaction—has become less common practice, due to the ease with which all clothing can now be replaced with new, inexpensive options in an endless variety of styles. Problems with fit, quality and durability are also turning the habitual consumption of apparel into a less satisfying experience.

The Environmental Protection Agency estimated that in the United States 84% of all textile waste is sent directly to landfills (U.S. Environmental Protection Agency, 2014). The landfill disposal of textile waste contributes to greenhouse gas emissions and is viewed by

advocates of recycling, as a missed opportunity for recovering valuable material and economic resources that can be put back to use through resale, re-use and recycling. Dr. Jana Hawley (2000, 2006, 2008) researched, investigated and published articles on the textile recycling industry in the U.S. and how it processes textile waste. However, currently, no research exists that explores the efficiency of the textile recycling system or the idea of domestic accountability for American textile waste. Ekström and Salomonson (2014) suggest that both clothing and textile reuse and recycling, are under-researched areas and that more information is needed on how reuse and recycling can be utilized by different stakeholders in society. The textile recycling system is controlled by a multitude of stakeholders seeking to recover and divert textile waste from landfills to put it back to use, capturing economic value, utilizing materials at hand and reducing environmental impact. These stakeholders range from fashion industry insiders including, designers, manufacturers, educators and academics, to charity resale organizations, private textile recycling brokers, municipal solid waste entities, state and federal governments and consumers.

Chapter 2

Literature Review

Causes of Textile Waste

Fashion Systems and Obsolescence

The concepts of fashion and obsolescence are synonymous with each other. Fashion represents change. Fashion objects are produced as different consumer items including cars, home furnishings, technological devices, apparel and more, and their consumption is closely tied to a thriving modern economy. Consumer products that are in fashion at any given time have a limited lifespan. The fashion system continuously introduces new models of desirable goods while it promotes the obsolescence of the old items. This is done as a way to entice consumers to purchase new products even when the ones they have are still usable. This is also known as planned obsolescence of which the objective is to stimulate consumer buying (Guiltinan, 2008). Economic growth has come to depend on the marketing of new products and the disposal of the old based on stylistic obsolescence (Claudio, 2007). Objects that are designed for fashion, including clothing, can increase rates of replacement and enable businesses to stimulate revenue from consumer repurchasing behaviors through the concept of obsolescence (Guiltinan, 2008). Black (2008) suggests that the term fashion can be distinguished from the term clothing in that fashion is based on desire and clothing is based on need, but that in a consumer society people shop to refresh their wardrobes allowing most people to have far more clothing than they actually need. This type of economy exists to always provide consumers with reasons to buy more products, even when it seems irrational (Packard, 1960) and is the lifeline of most modern businesses.

Due to the rapidly increasing production, purchase and disposal of fashion objects consumers are putting a strain on natural and human resources at unprecedented levels. With most products designed with a traditional cradle-to-grave life-cycle in mind (Braungart & McDonough, 2002), the environmental consequence of increasing waste streams has become an important issue of the twenty-first century. No consumer product is more closely representative of the velocity of which fashion objects can become obsolete than clothing. Although clothing is not the most ecologically significant consumer item, it is on the front line of unsustainable consumer practices (Schor, 2011).

Packard (1960) describes three ways in which products can be made obsolescent: obsolescence of function, obsolescence of quality, and obsolescence of desirability (p. 55). Clothing is classified as non-durable goods by the U.S Environmental Protection Agency, meaning by definition it is expected to last three years or less for its entire lifecycle. Traditionally, clothing companies and fashion brands released new selections of styles four times per year—one for every season—to give consumers options for replacing seasonal items as needed as well as other choices left to be desired. However in the late 1990's a market changing production and retailing model emerged called Fast Fashion. The model is based on rapid manufacturing and sales of inexpensive clothing designed to reflect the trends and look of the moment, particularly those that imitate high-fashion runway looks. Fast Fashion is characterized by fast and frequent style changes that contribute to an overall increase in production seasons and fashion cycles. Under this model new styles are released as often as several times in one month. Fast Fashion turns out constant inventory, stimulates consumption and increases profit margins for apparel businesses, all while selling clothing at lower and lower prices (Cline, 2012). Since its introduction to the market by the Spanish retailer Zara, the practice of Fast Fashion

apparel has gainfully employed all three of Packard's components of obsolescence by producing items that represent current trends but sacrifice quality and durability of function, quickly becoming undesirable when new fashions are available. Although the fast fashion model has been developed and mastered by specific brands like H&M, Forever 21 and Zara, it is a competitive business model that has been adopted across the industry by many clothing retailers to increase sales and profit margins.

Clothing Consumption

An increase in clothing consumption began in the late nineteenth century during a time when department stores in urban areas were becoming a norm. Fashionable, ready-to-wear garments were made increasingly available off the rack due to advancements in manufacturing. The clothing manufacturing industry drove the Industrial Revolution to become more efficient at meeting the basic human need for clothing (Gibson & Stanes, 2010) leading to wide availability and an abundance of clothing. By the late nineteenth century urban department stores had become a place for leisure consumption, especially by women interested in keeping up the modern looks (Craik, 2013). Department stores and mail order businesses specializing in ready to wear garments were allowing for a democratization of clothing and dress (Kidwell, 1974) and clothing consumption was on the rise. In the decades to follow, department stores worked to make shopping and spending money an easy and ego-rewarding experience, through attractive displays, in unique and beautiful structures (Kidwell, 1974).

Examining the particular consumption of apparel products and the concept of fashion—which largely represents change and obsolescence—compounds the problem of overconsumption (Hawley, 2008) and ultimately provides a trail for understanding more about

the amount of textiles ending up in global waste streams. With the advent of Fast Fashion and its disposability, overconsumption of clothing has reached new highs. The growing popularity of Fast Fashion coupled with a rise in inexpensive, imported clothing flooding the United States has contributed to the amount of textiles flowing into municipal solid waste streams. Product acquisition has been coupled with abandonment at unprecedented speeds (Schor, 2011). A study conducted by Birwistle and Moore (2007) found that respondents had an awareness of the considerable amounts of clothing being bought and sold but they were largely disinterested in the greater social, environmental and ethical impacts of it. Americans live in society of high consumption and disposal and an individual's worth is often measured by the clothing they wear (Hawley, 2000), which can increase pressures to consume and ultimately discard.

What resides in our garbage is the material evidence of many steps leading to wasting (MacBride, 2012) and clothing and textiles have become a greater and greater part of this behavior. Rubber, leather and textiles, materials that are often used in clothing shoes and accessories make up 8.7% of municipal solid waste generated in the U.S. (U.S. Environmental Protection Agency, 2014). Although reuse and recycling of used clothing and other textiles represents part of the solution for textile waste, ultimately there it is an underlying problem of overconsumption which has an effect on the environment and needs to be addressed through altering lifestyles and consumption patterns (Ekström & Salomonson, 2014). Ethical and sustainable models for consumption can be considered when looking at ways to reduce waste. However, due the implications that reducing consumption has on the greater global economy reducing consumption is often a controversial issue. Ekström and Salomonson (2014) found that companies in the Fast Fashion segment are not interested in discussing reduced consumption but

instead consider their participation in the promotion of reuse and recycling as action on sustainability issues and a way to justify and continue consumption at its current rate.

Birtwistle and Moore (2007) found that young respondents reported that they were more likely to retain expensive clothing for longer and to then eventually donate it to charity, while cheap clothing was more likely to be worn a few times and just thrown out. In some cases garments are so inexpensive, that it is possible to purchase a piece of clothing for the same amount as a bottle of water or soda. Low prices stimulate consumption and today's race to the bottom prices have triggered a shopping frenzy, where clothing consumers are buying, storing and throwing out millions of garments each year (Cline, 2012).

Effects of Textile Waste

Textiles in Municipal Solid Waste Streams

Textiles are used widely in the design of items that support basic human needs. Watkins (1995) suggested that clothing is a portable environment that serves to protect and shelter the human body from external environmental elements. Products like clothing, accessories, shoes, linens, towels and other household items are produced for utility function and are eventually disposed of, contributing to the growing stream of post-consumer textile waste. In addition to post-consumer, pre-consumer textile waste is generated by industrial production and manufacturing. The overall apparel industry contributes to both pre-consumer and post-consumer textile waste (Joung & Park-Poaps, 2013). Both pre and post-consumer textiles have great potential for reuse or recycling, but still find their way into municipal solid waste streams. Textile waste is entering municipal solid waste streams in growing numbers, posing new challenges for communities and municipalities in its handling and disposal. According to the

Council for Textile Recycling in the United States 25 billion pounds of textiles are thrown out each year, the equivalent of 82 lbs per person annually. Further, of this amount they estimate about that only 12 lbs of discarded textiles are donated for reuse and recycling, leaving the remaining 70 lbs to be thrown out directly into municipal solid waste streams, headed for landfills (Council for Textile Recycling, 2015). Although clothing is not the only form of textiles entering landfills, no research exists that dissects this number into categories of textile waste and this statistic is frequently framed exclusively in context of post-consumer clothing disposal.

Research suggests that textile waste makes up a largely untapped consumer commodity with strong potential for reuse or recycling (Koch & Domina, 1999). Despite textiles' strong potential for reuse and recycling an estimated 14.3 million tons of textiles enter into municipal solid waste streams, making up 5.7 percent of the total solid waste generation (U.S Environmental Protection Agency, 2014). Pre and postconsumer textile waste also has significant economic value in both domestic and global marketplaces as a second-hand clothing and recycled fibers. Ekstrom and Salomonson (2014) found that various stakeholders are already working together to collaborate in order to increase collection efforts, reuse and/or recycling projects and other landfill diversion efforts related to textile waste.

Like waste of all kinds, handling textile waste poses complex challenges for municipal solid waste management. Materials Recovery Facilities (MRFs) used by municipalities to collect, sort and store municipal garbage and recycling before further transport are generally not equipped for handling and sorting textiles for proper reuse or recycling. Because of this, most municipalities have avoided collecting textiles along side other materials for recycling. In municipal solid waste management, textiles are classified as non-durable goods. When looking at the relative biodegradability of non-durable goods in landfills, there are three categories: Labile

materials which are easily compostable and degrade fairly rapidly in about 5-10 years such as food scraps and other organic wastes; Resistant materials that are moderately degradable over 15-20 years; and Recalcitrant materials that degrade very slowly over 30-40 years in the landfill. Other outlying materials including plastics and metals hold their own label as Non-biodegradable. Within this classification system textiles are classified as Recalcitrant. However, since the mid-twentieth century there has been a rise in the use of man made synthetic fibers created from oil-derived polymers (Black, 2008). This means that many of the textiles that end up in landfills today possess some of the same properties as plastics and will therefore never degrade.

Textiles that are not recovered for reuse or recycling are destined for landfills or occasionally incineration. The long life of all textiles in landfills contributes significantly to greenhouse gasses, including Carbon Dioxide (CO₂) and Methane (CH₄). The Environmental Protection Agency estimates that the recovery of 2.25 million tons of textiles, diverted from landfills, has the carbon reduction equivalent impact of removing 1.2 million cars from U.S. roads (U.S. Environmental Protection Agency, 2014). This information provides evidence that increased recovery of clothing and textiles can have a major impact on reducing greenhouse gasses. Some research suggests that curbside recycling programs would dramatically reduce the amount of textiles sent to the landfill and that waste-recycling behavior is an indicator of the support that curbside recycling programs and policy (Daneshvary, Daneshvary, & Schwer, 1998). Domina and Koch (1999) found that a majority of households would be willing to recycle textiles and suggested that consumer's need education around the value that textile recycling has to the environment and the economy. Consumers are generally unaware of the need to recycle clothing (Birtwistle & Moore, 2007).

According to Black, man-made, synthetic fibers account for 60% of all textiles used for clothing, interior and technical textile products. (2008). Many textiles are made of a blend of natural and synthetic fibers that are easy to wear and low maintenance for consumers. However, these blends are difficult to break down and separate back into their original state for content specific fiber recycling into new, raw materials (Cline, 2012). That being said, all textile waste is in fact nearly 100% recyclable in one form or another (Hawley, 2011). Domina and Koch (1997) conducted another study where they created a model of the textile waste lifecycle, covering three types of textile waste they identified as having the potential to enter landfills: Post-producer waste made up of scraps, yarns and cuttings; Pre-consumer waste identified as unsold merchandise generated by retailers; and Post-consumer waste consisting of clothing no longer wanted by the consumer. Domina and Koch (1997) developed the model with the intention of “encouraging dialogue among textile and clothing professionals in an attempt to stimulate the kinds of pro-action necessary to further reduce textile disposal in landfills and to generate new or expanded recycling options” (p. 101). Recovering textiles for reuse or recycling contributes significantly to the environmental and social responsibility of textile and apparel industries (Hawley, 2006).

New York State’s Textile Waste Streams

According to the New York State Association for Reduction, Reuse and Recycling (NYSAR 3), 700,000 tons—the equivalent of 1.4 billion lbs—of textiles are disposed into landfills annually in New York State. This amount encompasses some pre-consumer waste, post consumer waste, as well as other commercial institution’s textile waste.

When it comes to apparel, disposal of products and other textiles is a process often unaccounted for during the stages of design, manufacturing, sales, and consumer use. Designing for end of life, reuse and lifecycle longevity can be further applied to fashion industry during both the manufacturing and consumption stages for apparel. Many strategies for sustainability are being tried out by emerging eco-fashion designers and established brands in New York City's garment industry. Apparel manufacturing is the largest manufacturing sector in New York City (Antonucci, 2012), making it a consistent contributor to textiles in New York State's waste streams in the form of pre-consumer waste. Within the fashion industry when considering pre-consumer textile waste, reducing or eliminating all waste offers opportunities both to save money on disposal and to push the overall industry towards sustainable practices.

Global Exports of Second-Hand Clothing

The global export of second-hand clothing and recycled textiles is a huge business. Based on volume, the U.S. is the largest exporter of second-hand clothing in the world (Hawley, 2006). Secondary Materials and Recycled Textiles (SMART) estimates that 60% of all clothing and textiles, recovered for reuse and recycling, equaling about 1.4 billion lbs are exported to over one hundred countries all over the globe (2015). Women in the global West consume more clothing than men making the supply of used women's clothing seven times that of men's entering the global waste stream (Claudio, 2007). However, the global trade of second-hand clothing and textiles has come under fire by some critics who feel exporting textile waste from first world countries to developing nations can have detrimental effects on local textile trades and indigenous dress (Hawley, 2006).

The consumption of second-hand clothing can be a catalyst for public opinion because of its connection to the human body (Hansen, 2000). This has particularly been the case when discussing exports to African Nations because the African continent is the largest importer of global second-hand clothing. The Bureau of International Recycling (BIR) claims that in some African nations over 80% of the population clothe themselves in second-hand clothing (2015). Although second hand clothing imports in Africa grew out of humanitarian aid efforts in the 1980's, clothing exports have evolved to be much less about charity and much more about profits (Hansen, 2000). More than 30 African countries have effectively banned or blocked used clothing exports for a variety of reasons including political efforts to protect local textile industries (Rivoli, 2009). However, in an extensive study Brooks and Simon (2012) found that while some casual studies have connected the import of used clothing to declining demand in African clothing manufacturing, the topic needs much further investigation to be proven with empirical evidence. They suggest that while the market for used clothing imports in Africa does seem to have an effect on the purchasing of new clothing products, there are actually other significant factors at play regarding the shrinking African clothing manufacturing industry including declining African incomes as well as expendable income, mismanagement of manufacturing facilities and increased competition from new Asian imports (Brooks & Simon, 2012). Interestingly, in China, the greatest producer of many of these Asian imports, second-hand clothing is also exported for global distribution, but its import is prohibited (Xu, Chen, Burman, & Zhao, 2014).

Brooks and Simon (2012) also found that accurate data sets for each country they probed in sub-Saharan Africa don't exist for reporting on the used clothing trade and in addition to economics there are a number of complex realities involving political and socio-economic

influences that need to be analyzed. This can be explained by the fact that buying and selling second hand clothing in Africa is very underground business. Many used clothing dealers in African Nations are much wealthier than their customers and forced to hide their wealth in an effort to remain credible with their customers (Hawley, 2006).

Much of the controversy around second-hand clothing exports has to do with the quality of clothing that is being shipped to developing nations. As previously mentioned, there has been a steady rise in the popularity and consumption of Fast Fashion and although these garments represent the most current styles, they are frequently of poor quality. The short lifecycle of these garments due their poor construction and quality ultimately contributes to textile waste generation. Some of this textile waste is exported for reuse even though it is in poor condition. Schor (2011) did an unpublished regression analysis of U.S. trade and found that the import of new garments is a predictor of the volume of used clothing exports. Further, the quality of new clothing being imported for sale in the U.S. has a direct impact on the quality of second-hand exports. The production of these garments is ultimately the responsibility of the global fashion industry, but the sorting and resale of garments creates ethical issues around textile recycling and sorting process, falling on the textile recycling industry.

Although much of moral debate around used clothing exports is extremely complex and has certainly not been resolved, certain areas emerge as more clear than others. First, second-hand exports are indeed purchased by importers, which suggests that there is a demand for these products among their local consumer demographic. Second, although second-hand clothing exports can be connected to the destruction of some jobs, they can also certainly be connected to the creation of others (Rivoli, 2009), since the sale of second hand imports in developing nations depends upon the entrepreneurship and micro-enterprise of those on the ground.

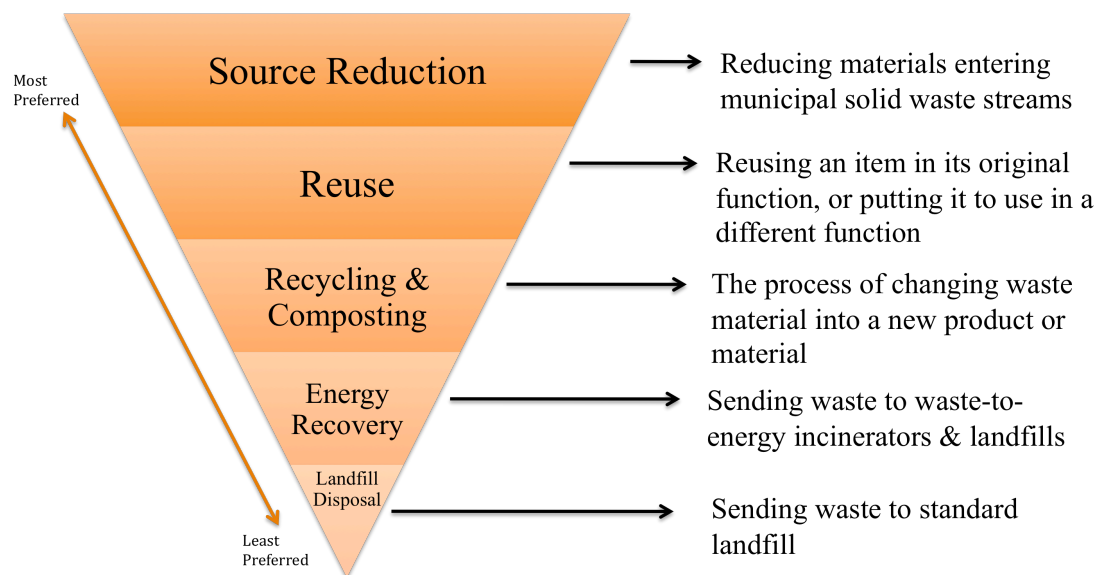
Dealing with Textile Waste: The Municipal Solid Waste Hierarchy

The U.S Environmental Protection Agency website defines Municipal Solid Waste as trash or garbage consisting of everyday household items that are used and thrown away. These items include newspapers, product packaging, bottles and cans, food scraps, yard waste, furniture, clothing, and more. The management of Municipal Solid Waste can be organized into a hierarchy of priorities that communities may use to meet their specific needs and maximize waste reduction. In order to do this, it is important to first understand how wastes are generated in communities. In the case of textiles, consumers, commercial institutions and manufacturing industries are all waste generators. However, while not all communities have apparel or textile manufacturing industries, all community residents are consumers and users of clothing and most have institutions like hospitals, hotels, restaurants and cleaning services that rely on the use of textiles for daily operations. Once the source for the waste is identified, a number of methods are employed for its management. Developed by the Environmental Protection Agency in 1989, the hierarchy of methods for managing solid waste includes source reduction, reuse, recycling and composting, waste-to energy combustion and traditional landfill disposal, in that preferred order as shown in Figure 2.1. Agrawal, Barhanpurkar, and Joshi (2013) also used this model to analyze textile waste management and outlined options for dealing with such waste.

Source reduction refers to waste prevention and also to reuse; it is a method employed to keep materials from entering municipal solid waste systems, which in turns reduces the amount of solid waste that must be managed by municipalities. Recycling, which is also extending to include composting, is the process of actually changing waste material into a new product or material. Recycling materials is desirable because it means that fewer new materials need to be

produced, while composting is a great option for separating highly degradable waste like food scraps and yard trimmings into organic material that can be used for gardening and nutrients for vegetation. Waste that cannot be recycled or composted is then ideally sent to waste-to-energy incinerators for combustion and electricity production. Electricity can also be produced at some landfills through the process of harvesting Methane from the waste. This is also a preferred choice for disposal before the final option of waste burial in traditional sanitary landfills.

Figure 2.1. Municipal Solid Waste Hierarchy of Management Methods



Graphic developed by Autumn S. Newell based on outline from the U.S. Environmental Protection Agency

Source Reduction

Source reduction refers to reducing materials that enter the municipal solid waste streams from their source. Apparel and household textiles in municipal solid waste streams are primarily generated by consumers that throw away unwanted clothing, shoes, accessories, towels, sheets and more. Additional textile waste is generated from the producers of these consumer items when manufacturers do not recycle production waste and from commercial institutions that do

not engage the textile recycling system to recycling their unwanted materials. Achieving source reduction of specific apparel products can be accomplished through reduced consumption of clothing, increased reuse of existing products and waste elimination strategies implemented during design and production. Source reduction for textile waste is a process that must be addressed by a variety of different parties invested in accomplishing waste reduction.

Beginning with apparel production, designers and manufacturers have opportunities to engage in waste reduction that can provide both financial benefit and reduce environmental impact. With 10-20% of textiles used in apparel production landing on the cutting room floor, there is a significant opportunity to turn around this impact (Rissanen, 2008). One method being used to achieve this is a pattern making technique called Zero Waste design. This technique seeks to incorporate all fabric yardage needed for the creation of a garment in two ways: creative pattern piece development and efficient pattern layout, both done in an effort to eliminate all waste generated during the design and production stages. Another form of apparel design that generates no waste is the process of full-fashioned knitwear, such as sweaters and other knitted garments. This is a process where pieces of a garment are individually knitted and then seamed together, therefore generating no unnecessary waste. This is a technique that has been used by home knitters for thousands of years and one that is also possible on an industrial production scale, through the use of high-tech knitting equipment. Both of these zero-waste methods mentioned are excellent strategies for source reduction of pre-consumer textile waste if adopted by more designers. However, a more frequent method for minimizing fabric waste is the use of digital marker-making software to plot pattern piece layout in order to maximize fabric usage during the pattern cutting process. Marker-making software is typically used to maximize fabric usage from a perspective of profiting-maximization when considering material expenses. But

additionally, finding ways to use production waste in other products can also contribute to source reduction and maximize the financial return on the materials used by not letting any go to waste. Finding end-uses for textile scrap, or developing a recycling system for textile waste generated in studios and manufacturing is a goal that many New York City based designers wish to achieve (Antonucci, 2012), but not one that has been streamlined at this point. Many forward thinking brands, designers and manufacturers are working towards zero-waste solutions within their production process.

In the case of post-consumer waste, a few larger, established brands including H&M, Nike and Patagonia are offering take-back programs, within their retail locations in an effort to keep used-apparel out of municipal solid waste streams. In February 2013, the Swedish Fast Fashion giant H&M began accepting any unwanted apparel in its retail locations around the world in partnership with I:CO, in exchange for discount coupon to purchase new items in H&M stores. I:CO, which stands for “I collect” is a for-profit textile sorting business based in Switzerland that collects post-consumer textile waste. For every kilogram of clothing collected, 2 eurocents (equaling about 2.26 cents per 2.2 American pound) are donated to a charity of H&M’s choice, which differs depending on the region. Nike also initiated a take back program that accepts worn out athletic shoes—also by any brand—which are then ground-up and transformed into a material called Nike Grind, that is used to make turf fields, tracks and other sports surfaces.

Patagonia— a brand that has a long history of efforts towards environmental responsibility—will take back only Patagonia products through their retailers that are then resold through their Common Threads project in select storefronts and on eBay.com. According to their website, Patagonia has resold 41,377 of their own used products and also recycled 56.6 tons of

worn out Patagonia gear, since implementing the take-back program in 2005. In 2010, Patagonia launched the Product Lifecycle Initiative, as an extension of the Common Threads project. As part of this initiative, Patagonia encouraged something radical from consumers: reduced consumption of all apparel products, including Patagonia products (Reinhardt, Casadesus-Masanell & Kim, 2010). Reducing consumption is a viable form of source reduction, but as previously addressed, one that can be controversial in an established, consumer-based economy. For this reason, it is a bold move for a company that sells apparel products to suggest that consumers not buy them. Ironically, the result of this suggestion by Patagonia and the 2011 marketing campaign “Do not buy this jacket”, ultimately led to a 40% growth of the company over the next two years (Stock, 2013).

In addition to take-back programs, many larger apparel campaigns are using Life Cycle Assessments to helping brands think through the environmental impact of their products. Life Cycle Assessments consider the entire lifecycle of a brand’s product, from the choices in raw materials, through consumer use, and products disposal (Dickson, Loker & Eckman, 2009). Life Cycle Assessment tools can help brands implement strategies for reducing their products’ environmental impact during design and development phases to manage end-of-life disposal options. While all the above initiatives incorporate other methods of waste reduction like reuse and materials recycling, their implementation ultimately contributes directly to source reduction, by reducing the amount textiles processed and managed by the municipal solid waste system.

Reuse

When considering options for disposing of post-consumer apparel and textile waste, consumers have several options: discard, donate, reuse, trade or sell (Solomon & Rabolt, 2009).

In a study on consumer clothing disposal behavior, Bianchi and Birtwistle (2011) found that donation to charities and passing along unwanted items to family and friends are the most popular forms of clothing disposal. This suggests that reuse is the preferred method for waste reduction by consumers. Reuse, along with recycling can lengthen product lifecycles and usage (Ekström & Salomonson, 2014). Reuse is a form of source reduction, when resources can be recovered for an extending lifecycle. Reuse is grouped with source reduction on the EPA's website for the waste management hierarchy shown previously in Figure 2.1.

Textile sorters, who process recovered textile waste, are searching for “diamonds” which are select pieces that command a premium resale value on the second hand market (Hawley, 2006). In a conceptual model developed after five years of qualitative research, Hawley (2006) found that the volume is inversely proportional to the value of goods meaning that the most valuable items on the second-hand clothing market are a rarity, while the lower grade and quality items are significantly more abundant in their supply. While lower grade, Fast Fashion garments are thrown out in greater volumes, they are often not suitable for reuse due to their poor quality (Ekström & Salomonson, 2014), but must still be processed by sorters once they enter the textile recycling system.

Clothing and textile reuse is often associated with resale and second hand shopping. Xu et al. (2014) suggest that certain values are perceived when shopping and purchasing second hand clothing which include: economic value in bargain shopping; the idea of treasure hunting for affordable items that allow for individual uniqueness; and the ability to express social consciousness and environment concern through shopping second hand clothing. Second-hand shoppers often describe feeling of great pleasure—a rush or thrill—that comes along with the experience of acquiring an unexpected object and saving money at the same time (Ayers, 2011).

Each of these factors has the potential to impact reuse rates, but only if second-hand shopping becomes more widely acceptable in the coming years.

There is evidence that this is already the case in the U.S. During the past 40 years, second hand shopping has become more widely acceptable, losing much of the shame and stigma associated with it and transforming into an ethical alternative to unbridled consumption (Franklin, 2010). In a comparative study of American and Chinese consumers, Xu et al. (2014) found that American consumers perceived a higher value than Chinese consumers in finding unique items through shopping for second-hand clothing, contributing to second shopping being more acceptable among Americans than Chinese. Joung and Park-Poaps (2013) conducted a study of college students to learn about their preferences for clothing disposal and found that economic concerns around saving money was a strong predictor for reuse and resale behaviors. Interestingly, they also found that environmental attitudes were related to donation behaviors but not to resale behaviors, and that neither of those behaviors were influenced by subjective norms of peers.

Recycling

Recycling is the process of changing waste material into a new material or product. Although the general public tends to think of the act of material recovery as recycling, recycling actually refers to the remanufacturing of recovered items into new materials. A majority of recovered textiles are not actually recycled but are simply reused or repurposed as is. The Council for Textile Recycling (2014) estimates that of textiles collected for recycling, 45% are reused and repurposed, 30% are converted and recycled into wiping rags, 20% are recycled into fiber for other products as mentioned, and the remaining 5% is disposed of as solid waste.

Textile recycling is actually one of the oldest forms of recycling. More than 2,000 years ago, in China, worn out clothing was shredded and reprocessed by hand to create new virgin yarns for the production of new textiles (Hawley, 2006). Textiles are inherently recyclable materials that can be put back into use in variety of new products. According to the trade association Secondary Materials and Recycled Textiles (SMART), all unwanted textiles can be processed for recycling, with an average of only 5% deemed unsuitable for reuse or reprocessing into new fiber content due to contamination. Clothing and other textiles that are not suitable for reuse can be cut into items such as wiping rag and polishing cloths. Stained textiles can be transformed into a new fiber referred to as *Shoddy* in the textile recycling industry which is then used in various applications including furniture stuffing, upholstery, home insulation, automobile sound-proofing, carpet padding, building materials and other products. Another innovative use being explored is using textile waste to retrofit existing concrete structures including buildings and bridges for structural reinforcement during earthquakes by transforming it into a material similar to carbon fiber reinforced composites (Manly, 2014).

Remanufacturing textile waste is an excellent example of what McDonough and Braungart (2002) refer to as “waste equals food”. In their ecological manifesto book *Cradle to Cradle* they outline how the natural world only produces waste that returns to the ecological system, by feeding it nutrients that add to another cycle of life. This is a stark contrast to waste generated by human society that eventually ends up in a grave-like afterlife that can contaminate eco-systems and take away from future lifecycles (McDonough & Brungart, 2002).

Textile recycling can be specified by material type, but is very challenging because many textiles are made of specialized blends of natural and synthetic fibers that are impossible to separate once combined. One example of this is Jimtex Yarns, manufactured by Martex Fiber,

which uses 100% cotton waste—that can be either pre or post-consumer waste—blends it with small percentage of acrylic or polyester and spins into new yarns that can be used in the weaving or knitting of new textiles. Martex also produces a variety of other blended recycled fiber products that are used for bedding, automotive construction and other applications.

Another approach that combines the idea of re-use and recycling is the concept of Up-cycling. The idea of Up-cycling is to explore what can come next in a product's afterlife and urges for creativity in design and reuse that has positive impacts and provides continuous improvement for ecological, social and financial conditions (McDonough & Braungart, 2013). Up-cycling is a hybrid process of reuse and recycling where the final product often becomes a re-engineered version of itself, with a new twist. More specifically, Up-cycling is the idea of adding value to something that is considered waste, to again eliminate the idea of waste altogether. An example of this is taking an old pair of blue jeans, cutting them up and re-sewing them into a skirt. Alterations and repairs like this that give a garment a new life have been taking place in homes forever as a way to extend the lifecycle of garments that people already own. Up-cycling garments utilizes existing materials, adds value back to garments that may otherwise be considered waste and adds longevity to garments by refreshing their style. Up-cycling is a practice that is widely accepted as a form of sustainable clothing design through its reuse of post-consumer textile waste.

The term Up-cycle is synonymous with the term re-fashion, and has some gained momentum in the apparel industry. Some clothing designers and brands are also using their ingenuity and working with reclaimed, pre-consumer production waste, transforming it into beautiful, high-end garments that are individually conceived (Brown, 2013). The Up-cycling

movement is particularly prominent on the on-line market place etsy.com, where do-it-yourself design entrepreneurs are redesigning and reconstructing clothing into new, desirable products.

Young, Jirousek and Ashdown (2004) did a study to explore the design process and feasibility of working with post-consumer textile waste as the raw materials for new products, as well its acceptability with potential consumers. They found that among potential wearers the practice of deconstructing and reconstructing second-hand clothing into new garments made the wearing of used clothing more socially acceptable among their respondents.

Recycling existing materials is desirable because it means that fewer new materials need to be produced. This can in turn lead to benefits including decreased factory emissions, reduced dependency on new natural resources, and a lower dependency on landfills (Liming, 2011). In the 1980's increasing landfill disposal rates and decreasing availability of landfills sites began to contribute to increasing environmental awareness around solid waste issues, which eventually contributed to expansive new recycling legislation (Domina & Koch, 1997). Although the concept of recycling is a generally accepted as good idea and an excellent alternative to disposing of all wastes into landfills, recycling industries do also have their critics. Critics argue that the time and resources devoted to collecting and engineering recycling processes can never be recovered economically or justified by environmental benefit. Specifically in regards to textile recycling, Norris (2012) argues that industrial textile recycling is a form of unfair down-cycling, where value of the handled materials is constantly falling, still seen as waste and continues to contribute to the social economic inequality that exists in the shadow of capitalism. Contrarily, Baxi (2014) argues that although there is controversy over the global transport of wastes and its handling by many of the world's poorest and most desperate populations, recycling industries should be viewed as providers of economic and material resources in a world where natural

resources are strained and consumption is not slowing. To this point, proponents of recycling industries, including textile recycling, make claims that recycling contributes significant economic and environmental value. By working with businesses and industry, recycling movements cultivate alternatives to landfill disposal, local employment and environmental protection of forests, waterways and ecosystems (MacBride, 2013).

Compost

Composting textile waste was a much more viable option for disposal during a time in history when clothing and other items were made exclusively of pure, natural fibers. Like food, natural fibers are derived from animal proteins and plants, making them suitable for compost as a form of disposal. These include cellulosic fibers such as cotton, flax, hemp, jute, as well as animal protein fibers like silk, wool, cashmere, alpaca and angora. Natural fibers, in their pure state, could be treated like food wastes which are classified as rapidly degradable, Labile materials in municipal solid waste. Theoretically, they should be easy to compost in both high-heat composting operations or in a backyard composting system if they are cut into smaller pieces. However, textiles as whole are actually classified as Recalcitrant in municipal solid waste, and are considered at best, very slowly degradable, and hence poor candidates for composting. This is due in part to the common practice of blending natural with synthetic fibers that are difficult to separate once combined in fabric yarns. Although synthetic materials can be separated from natural/synthetic blend through a chemical process, this process is not economically viable (Hawley, 2006) and therefore not likely to be used as pre-composting step.

Over the past 70 years, there has been a significant rise in the use and popularity of synthetic fibers (Black, 2008). Synthetic fibers are engineered and can be derived from

petroleum or plant based starch and cellulosic materials. Petroleum based materials, also commonly identified as plastics, have a distinct classification in solid waste—along with metals—as Non-biodegradable. Even if municipal solid waste handlers wanted to implement composting natural fibers, sorting unwanted textiles products by fiber content would be an arduous task.

Additional challenges to composting textiles exist with the pesticides and herbicides used in agricultural fiber cultivation, as well as the chemicals used in the cleaning, dyeing and finishing processes of fabric production. Conventional cotton crops, for example are estimated to use 25% of insecticides and 10% pesticides used worldwide (Black, 2008). Nearly all fabrics also require some sort of chemical cleaning, dyeing or finishing stage during production, unless the manufacturer opts for a natural finishing process. Many of the chemicals found in finished fabric are listed in the Occupational Safety and Health Administration's (OSHA) Toxic Release Inventory list, on the basis of their potential as carcinogens that can have adverse health effects. Acrylonitrile, Formaldehyde, Trichloroethane and Vinyl Chloride are just a few that are listed as known or possibly carcinogenic to humans (U.S. Environmental Protection Agency, 2011). These toxic chemicals can be hazardous contaminants to compost, adding to the unsuitability of textiles for compost as a disposal option.

There has been some innovation in clothing and fibers that claim to be fully compostable. One company dedicated to advancements in the area of fully biodegradable materials is Puma. Puma has been working with the Cradle to Cradle Products Institute in the development of their InCycle product line that promises to be either 100% recyclable or biodegradable. As part of the development of the biodegradable side of this line, Puma recognizes that these products must be made exclusively of organic fibers, free of all toxic chemicals, in accordance with international

standards for composting. However, even if companies like Puma are able to accomplish this having the proper channels for collection, sorting and composting of these garments at the end of their lifecycle is a long way off.

Waste to Energy Incineration

Waste-to-energy incineration is one of two final disposal options. Waste-to-energy incineration is the practice of burning solid waste to recover heat energy that is used to generate electricity. In accordance with the hierarchy of solid waste management, if textiles cannot be recovered for reuse, recycling or composting, the next best option is to produce energy from them. Textiles, particularly synthetics, are highly combustible and produce a lot of heat when they are burned, making them well suited for waste-to-energy incineration. Textiles can also be incinerated in any condition, even if they are stained or contaminated. From an economic standpoint there is little reason for municipalities to get involved in textile recovery or recycling because waste-to-energy and landfill disposal have proven to be the easiest and most cost effective for handling textiles (MacBride, 2013) when it is possible. Although waste-to-energy is a practical way of recovering value from textile disposal in the form of energy production, the process of incineration is still controversial. The stacks from waste-to-energy plants emit substances that are potentially harmful to humans and the environment, including dioxins, heavy metals, acidic gases and fly ash particles (Agrawal, Barhanpurkar, & Joshi, 2014). For these reasons, along with the expense that comes with building waste-to-energy facilities, the number of plants is limited in the United States.

Evidence exists that the practice of incinerating textiles is more popular in Europe (Hawley, 2006). This can be explained by the fact that fuel prices are higher in Europe resulting

in the use of more alternative fuels and energy creation (Hawley, 2006) and thus there is a much higher number of waste-to-energy plants throughout Europe than in the United States. As of 2014, there are 86 waste-to-energy facilities in the United States, with more in planning stages, and 400 located across Europe (Waste Management World, 2014). While acceptance of waste-to-energy is growing in the United States, only 11.7% of municipal solid waste generated—17.8% percent of the total discards remaining after recovery— is sent to waste-to-energy facilities (U.S. Environmental Protection Agency, 2014). This means although waste-to-energy is the preferred option for disposal after recovery, because of the availability and accessibility of waste-to-energy facilities, incinerating textiles has a long way to go before it exceeds landfill disposal for all waste, including textiles.

Landfill Disposal

The final and least desirable disposal method in municipal solid waste management is to send waste to landfills. The goals of the municipal solid waste management hierarchy are first, to reduce waste generation and second, to process waste in a manner that diverts as much as possible from landfills. It is estimated that only 15.7% of textile waste is recovered from the total waste generated in the U.S (U.S. Environmental Protection Agency, 2014). Based on Environmental Protection Agency data, out of the remaining 84.3% of textile waste—after incineration rates are subtracted— 71.7% of textiles are sent to the landfill.

Organic materials such as natural fibers like cotton and linen slowly degrade in landfills through the process of anaerobic digestion, contributing to methane (CH₄) production. As previously mentioned, synthetic fibers that are petroleum based do not decompose in landfills (Bureau of International Recycling, 2015) and can exist in landfills for hundreds of years. When

garbage is disposed of into landfills it is buried beneath layers of dirt, but landfills that harvest methane (CH₄) but some landfills are outfitted to harvest methane (CH₄) from the mounds for energy production. Within the municipal solid waste hierarchy these landfills are preferred because the methane (CH₄) is captured and put to work creating energy instead of being released into the atmosphere. According to the Environmental Protection Agency's Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2012 (2014) even though waste generation is increasing each year, methane emissions from landfills have been slowly decreasing year over year due to an increase in landfill gases harvested for energy production and an increase in organic materials diverted from landfills.

Landfill tipping fees—the charge collected based on weight for disposing of waste in to landfills—are also increasing due to economic inflation and increasing landfill scarcity in the United States. Physical space for traditional sanitary landfills is an increasing concern in the U.S., particularly in the Northeast. Over the past 25 years there has been a 75% decline in landfill disposal facilities, meaning that waste must now travel further to be disposed of into landfills (Palmer, 2011). The increasing transport of solid waste to distant landfills is another contributor to the production of carbon dioxide (CO₂). Further, limited space is also contributing to rising disposal costs. As space for landfills decreases, disposal prices rise, environmental concerns grow and it is necessary to take further steps in the reduction of all waste entering landfills.

According to the New York State Department of Environmental Conservation's inventory of municipal solid waste landfills, as of January 2015, there were 27 active landfills in New York State accepting approximately 6 million tons of waste each year, with approximately 28.5 years of waste capacity left. Opening new landfills is a highly political issue because most

people do not want to live near landfills due to pollution, noise, traffic and odor concerns. This makes it very difficult to open new landfills in densely populated states, like New York. In 2001 Staten Island's Fresh Kills landfill was closed by Rudy Giuliani, the mayor of New York City at the time as part of a promise made during his campaign for re-election. The Fresh Kills landfill did at one point service much of the garbage produced in New York City, but now residential garbage from all five boroughs began being trucked out of state to be disposed of in landfills in Ohio, Pennsylvania, Virginia and South Carolina (Florio, 2012).

Textile Waste Resource Recovery

Insufficient recovery of post-consumer textile waste is the greatest obstacle to the textile recycling movement (Joung & Park-Poaps, 2011), a sentiment that echoed by both the Council for Textile Recycling and the Secondary Materials and Recycled Textiles trade organization. These organizations are both actively engaging campaigns to increase recovery rates in the United States, seeking to utilize textile waste for new purposes over sending it to landfills for disposal. In order to achieve higher donation and recycling rates from textile consumers, educators, the media, charity organizations and fashion retailers must all encourage consumers to engage in textile recycling efforts (Bianchi & Birtwistle, 2011). These efforts must also include participation by federal and state governments in order to maximize potential for success. Increasing recovery of pre and post consumer textile and apparel waste can create economic opportunity, and reduced environmental impact. As part of paving the way for the recapture and recycling of textiles, policy makers must create an environment that allows for the easy disposal and free-flow of all recyclable materials, including textiles (Hawley, 2008). Municipal curbside textile recycling collection can decrease the amount of textiles sent to the landfill while having positive effects on the environment (Daneshvary, Daneshvary, & Schwer, 1998). Proper

collection and handling of textile waste by diverse stakeholders, including government agencies, municipalities, non-profit and for profit businesses, can contribute to economic and ecological benefits and move communities closer to zero-waste goals.

McDonough and Braungart (2002) introduce the idea of shifting away from the standard “cradle to grave” design and production of consumer goods that generates constant waste, into a new, more sustainable production model they call “cradle to cradle” where waste, unwanted, and/or unused, is treated as a resource that is recovered put back into use. McDonough and Braungart (2013) also propose Up-cycling as way to continue exploring concepts of handling waste and the afterlife of consumer products, urging for creativity in design and reuse that can have a positive impact and provide continuous improvement for ecological, social and financial conditions. Noman et al (2013) did a study on pre-consumer textile waste in Faisalabad, Pakistan to understand the economic and environmental potential for recycling the waste. After identifying the many types of waste products produced from the textile industry, they found that most of the waste was reused and recycled in a variety of ways contributing to a nearly zero-waste system that creates important economic activity and keeps materials out of landfills. Pakistanis have identified ways to recycle materials such as cotton dust into fuel bricks that burned as alternatives to wood and created an excellent zero waste model for handling all kinds of waste left over from the textile production and manufacturing sectors (Noman, Batool, & Chaudhary, 2013).

Hawley’s study (2006) focused on textile sorting companies that obtain, sort, export and market post consumer textile waste in the United States. Textile sorters work to recover and sort unwanted textiles into a multitude of categories which are then sold off wholesale to private buyers who participate in global exports, domestic retailing, fiber conversion into industrial

feedstock, and rag cutting. Textile sorters were traditionally known for collecting textile waste in order to recover the small percentage of items sought after by collectors and retailers, but have realized that their sort categories can be further refined to meet the demands of a number of unique markets and industries (Hawley, 2006). This suggests that further textile waste recovery can contribute to economic development in the United States. By expanding textile resource recovery efforts there is significant opportunity for economic gains that contributes to Green job creation in collection and handling, as well as product innovation for textile waste up-cycling and fiber recycling.

Donations

One efficient way to collect post-consumer textile waste has been for consumers to donate their unwanted clothing and household textiles to charitable organizations and donation centers that are set up to handle and sort textiles for reuse and resale. This has traditionally been the main entry point for input into the textile recycling system. The model of soliciting material donations, including clothing, to stimulate charitable economic activity, emerged in the late nineteenth century and was pioneered by two organizations: Goodwill Industries and the Salvation Army (MacBride, 2013). Since then donating unwanted clothing and household textiles has become popular form of disposal for consumers and kept many textiles from entering municipal solid waste streams.

In order to increase the amount of textiles that are recycled and decrease the amount entering municipal solid waste streams destined for landfills, recycling behaviors must be considered. Koch and Domina (1999) found that donating textiles to places like Salvation Army and Goodwill were the most frequently used method of disposal reported by respondents to their

household survey. Engaging in recycling acts through donating unwanted clothing is part of the process of consumption for consumers (Ha-Brookshire & Hodges, 2009). Donating items to charities is one way that consumers justify the desire to purchase more clothing and erase guilty feelings when their closets are already filled with wearable items (Hawley, 2006). A prominent motivating factor that triggers donation behavior is the desire to clean out one's closet in order to make room for new stuff (Ha-Boorkshire & Hodges, 2009). Ha-Brookshire and Hodges (2009) also found that amongst participants interviewed regarding clothing donations, each respondent had a preferred place of donation but none of them were able to explain the role that site played in society. This suggests that although people are willing and able to donate their clothing to organizations, there is a general lack of information around what their donations actually support or what actually happens to the donations once they enter this system and are processed by the textile recycling industry.

One important variable that also factors into the donation process is the convenience of donation locations. One way that that charitable donation centers have accommodated for this variable is to place donation bins in locations that are more convenient for consumer drop-off than their donation centers. However, it is not just charities that are placing these bins out to solicit donations. A growing number of private, for-profit bin operators are placing bins in many locations, often under the guise of charity and some are even being illegally placed on public property. Bin placement is allowed on private property but is prohibited on public property in New York as well as other states.

An article in the New York Times states that for-profit collectors can use a charitable facade to elicit value for their businesses while alternatively, charitable, non-profit collectors redistribute money back into the community more directly (Gonzalez, 2014). In New York City

illegal bin placement on public sidewalks and other areas has become a growing problem with bins appearing in dramatically increasing numbers. In the year 2014, 2,006 illegally placed bins were tagged and cited for 30 day removal with 132 eventually being confiscated (Gonzalez, 2014). This is not only a problem in New York, but is also trend that is growing nation-wide as interest in clothing and textiles waste as a commodity continues to grow. While some argue that non-profits operate a more honest business model that contributes more directly to communities in need, there is also a case to made for the financial contributions that private businesses, especially small businesses, make to communities in the form of economic activity and job creation. Either way, in the case of clothing and textile donation bins, there is significant confusion about where donations end up and what they directly contribute to. However, it can also be argued that the growing number of bins is allowing for more input into the textile recycling system.

Municipal Collection

Another emerging point of entry into the textile recycling system is the participation of municipal solid waste programs in partnerships with the textile recycling industry. Traditionally, municipal solid waste programs have encouraged consumers to recycle materials such as plastics, glass, aluminum and paper, but have overlooked municipal textile recycling programs (Hawley, 2000). They also facilitate the collection of these materials curbside along with the collection of trash. Most municipalities are not in a position to incorporate curbside textile collection programs because textiles have unique qualities that must be considered when planning comingled collection (MacBride, 2012). Protecting textiles from contamination caused by comingling with other recyclables is an important step in collection efforts so that textiles can

be processed for reuse or recycling. If textiles become wet or mildewed, they cannot be sold for reuse or recycling. Implementing municipal textile collection programs is challenging because collection trucks and materials recovery facilities are filled with dirty materials that can easily contaminate textiles through exposure. Also, more and more municipal recycling collection programs are switching to single-stream materials recovery facilities where recyclables are sorted by advanced, automated sorting equipment that makes the process extremely efficient. On the contrary to these streamlined systems, textile sorting must be done by hand, therefore making it only possible in dual-stream materials recovery facilities where materials are kept mostly separate, and special attention can be given to the materials.

Guidelines and ordinances can help municipalities specify how residents should prepare textile waste for collection (U.S. Environmental Protection Agency, 1995), but without federal or state regulation in place, the impetus for establishing ordinances remains weak due the complicated nature of textile collection. Pre and post consumer textile waste is considered non-hazardous and its disposal is currently not regulated. Businesses that manufacture textiles—before they are then remanufactured into consumer products like clothing—are subject to regulation under the federal Resource Conservation and Recovery Act (RCRA) because of waste and wastewater that can be generated as bi-products of dyes, finishes and solvents used that can be hazardous. However, once these materials move onto to the production process of consumer goods their disposal is not regulated at all.

Although curbside collection programs can be difficult to establish for logistical and financial reasons, some studies have shown that residents would support implementation of curbside textile collection programs and that resident recycling behavior is a good indicator for the success of these programs (Daneshvary, Daneshvary & Schwer, 1998). Hawley's (2006)

study suggests that municipalities who choose to add textile recycling programs could subsidize the cost of other recycling programs with the financial gains earned from textiles. Koch and Domina (1999) conducted an exploratory study looking into how and why households are disposing of textiles, while incorporating the importance of convenience on the recycling frequency. They found that respondents with curbside recycling collection were significantly more likely to recycle than those without it that had to deliver their recyclables to deposit locations reinforcing that convenience does influence recycling behavior.

As an alternative to municipal curbside collection of textiles, some municipalities are partnering with either for-profit or non-profit textile collection businesses that are equipped to handle and sort textiles and keep them free of contamination. An example of this is the partnership between the City of New York's Department of Sanitation and the non-profit organization Housing Works. The two entities have teamed up to place collection bins in large apartment buildings and businesses like laundry-mats to make textile collection as convenient as possible for residents. Textiles are then and processed by Housing Works who resells select items in their thrift stores then pass on the remainder to textile sorting businesses who sort them for additional recovery and distribution. Another example of a partnership between a municipality and private industry can be seen in San Francisco. As a part of its Zero-Waste Initiative, the city has embarked in a similar partnership with I:CO—the same for-profit textile recovery business that is used by H&M—to place bins in retail businesses and buildings around the city for convenience to its residents. Both examples represent ideal situations for both the municipalities and textile recovery businesses because collection efforts are simplified, municipal solid waste is reduced, materials recovery is increase and important revenue is generating.

Systems Theory

Overview of Textile Recycling System

Hawley (2006) introduced the application of systems theory as a theoretical framework for collecting and analyzing qualitative data on the textile recycling industry. In the field of apparel and textile study, Hawley's research has led the examination of textile recycling in the United States as a system from its collection, to sorting to foreign exports. Although textile recycling is a recognized process, little scholarly research has been conducted that proposes models for understanding this supply chain, or that looks at textile recycling as a system (Hawley, 2006). Further, little research has been conducted to understand exactly why so much of American textile waste is ending up in landfills and no studies have been done that examine a specific state as a case study for understanding the efficiency a textile recycling system. Hawley (2000) used a micro/macro continuum framework to understand how certain behaviors and attitudes of individuals are interrelated and affect the whole system. To further this area of research, this study is intended to understand the workings of the textile recycling system that processes primarily post-consumer textile waste, in the form of clothing and other household textiles and how this system can be strengthened to effectively divert more of these materials from landfills.

Systems Theory also serves as the theoretical framework for this study. Ludwig Von Bertalanffy – a renowned biologist—is credited with establishing systems theory thinking in his famed book *General Systems Theory: Foundations, Development, Applications* published in 1968. Systems theory has become popular across a variety of disciplines for evaluating existing systems. Systems theory allows for understanding of the interconnectedness between entities that

can otherwise seem independent and unrelated to one another. Howard T. Odum—an American ecologist credited with bringing general systems theory to the field of ecology—emphasizes that humans who design and construct things have the ability to see all of the parts, functions and external relationships that are predictors of the outcome of the system (Odum, 1983). A system can be defined as a set of parts that are organized and interconnected into a structure that achieves a certain purpose through its behavior (Meadows, 2008). In the case of the textile waste management system, the existing structure seeks to divert these materials from municipal solid waste streams and landfills in order to recover economic value from them through organized collection, sorting and distribution for resale, reuse and recycling.

Textile waste is recovered and handled by a complex textile recycling system that includes policy makers, solid-waste and recycling managers, not-for-profit organizations, for-profit businesses and consumers (Hawley, 2000). This larger system of stakeholders supports the established textile recycling industry that configures its own reverse supply chain with local, regional and global markets and distribution channels. Similar to the supply chain which transforms fibers to apparel and brings it to consumers, clothing and textile waste also has its own lifecycle (Domina & Koch, 1997). The handling and distribution of post-consumer textile waste, has become a global enterprise. However, data from the U.S. Environmental Protection (2014) Agency states that only 15.7% is actually recovered for reuse and recycling, of the 14.33 million tons annually discarded in the United States. These figures suggests that there are huge inefficiencies with the textile recycling system that are causing most textile waste to end up in sanitary landfills. Therefore, exploring all options for diverting waste from landfills, as well as evaluating the systems in place that support diversion efforts, is an important area of research.

Working on sustainable solutions related to waste generation and processing is critical to the future of people, the planet and the economy. Increasing waste streams and related green house gas emissions contribute to global sustainability concerns, and therefore analyzing the systems that can affect positive changes in these areas is an important practice. In order to influence systems and begin their restructuring, systems thinkers can identify leverage points that can facilitate systemic change (Meadows, 2008). A comprehensive analysis of the overall process of the system is needed to execute the goal of reduction, reuse and recycling (Hawley, 2006).

In her research, Hawley used systems theory to look closely at the system within the textile recycling industry and thoroughly examined how materials were sold and processed by the industry. In an effort to build on Hawley's research, the focus of this case study, system analysis of New York State is to understand the roles of different stakeholders that affect the textile recycling system in order to identify some of these leverage points.

Some of the stakeholders included in this study are from the textile recycling industry and focus their efforts on reclaiming economic value from materials collected for resale, reuse or recycling. Other stakeholders included generate both pre and post consumer textile waste like consumers, clothing designers and manufacturers. Additionally, this study looks at outside influences such as policy makers in local and state governments, educators and academics that influence the textile recycling directly and indirectly. Each of these stakeholders plays an integral role in influencing the input and output to the textile recycling system. Leverage points exist both in the input and outputs of the system that can affect its flow, efficiency and overall function.

Research Questions

Qualitative research involves approaching a topic to be investigated with research questions, rather than a developed hypothesis (Flynn & Foster, 2009). In an effort to understand what is being done with textiles that are recycled—instead of disposed of into landfills—this inquiry about clothing and textile waste began with a series of qualitative research questions. With the existing knowledge that nearly 100% of textiles are recyclable, this raised a significant question: *Why is so much of U.S. textile waste disposed of into landfills?* The answer to this specific question is broad and beyond the scope of this research when applied to the entire United States, so taking a closer look at the unique position of New York State led to the development of more specific questions. Several objectives were identified during the design of this research that aided in the development of the research questions. First, one of the main objectives was to understand the existing textile recycling system in place for handling recovered textile waste and to apply it specifically to New York State. This led to the development of the first research question:

R1: What is the existing system in place for recovering and handling textile waste in New York State?

The next objective was to identify where both efficiencies and inefficiencies might exist within the identified textile recycling system that could aid in a broader investigation of why such a large percentage of textiles end up in landfills each year in the U.S. Applying the systems theory framework allows for an understanding of the flow of materials moving in and out of this system, as well as any possible inefficiencies within the system that affect the amount of textiles entering landfills instead of being diverted. This led to the development of the second research question:

R2: Is there fragmentation within the existing textile recycling system that can be improved to increase efficiency?

Another objective of the study was to identify methods and procedures for source reduction, collection, reuse and recycling that reduce landfill disposal of apparel and textile waste in New York State, that could also be applied in other locations. Additionally, understanding the potential economic and environmental impact that expanded resource recovery efforts could have was another desirable outcome. To accomplish this, the third research question was created:

R3: Could expanded resource recovery efforts of textile waste contribute to economic development, job creation and reduced environmental impact?

Finally, New York State is a unique place for a case study on the issue of waste because New York City is one the four major fashion capitals of the world, alongside Paris, London and Milan and it could be argued that is the fashion capital of the U.S. There is a cultural appreciation and enthusiasm for fashion and clothing in New York City because it is an international fashion epicenter with a historic garment district and a home to designers and brands that influence the global fashion industry. This historical context for New York City suggests that New York City and New York State overall are great generators of both textile waste. This led to the development of the last research question:

R4: How much of New York State's textile waste can be processed locally and regionally, versus shipped elsewhere or overseas?

All of these questions were developed based on New York State's unique position in the global fashion industry to probe whether it could be at the forefront of creative innovation for the reduction and handling of textile waste, in the United States.

Chapter 3

Methodology

Triangulation

The validity of qualitative research has always been a concern within the research community. Qualitative validity is understood as the degree to which the researchers claim the knowledge being presented corresponds to the reality of the subject being researched (Cho & Trent, 2006). To address the concern of validity, this study was designed to incorporate multiple data points in an effort to triangulate and reinforce any findings that answer the established research questions of this study. Triangulation is a process of identifying common themes, or categories that arise through multiple methods of data collection as suggested by Creswell & Miller (2000). They argue that triangulation exists as a validity procedure that gives researchers collecting qualitative data a way to “provide corroborating evidence through multiple methods” (p. 127), rather than simply relying on a single resource data point in a study. The design of this study used multiple methods to gain a comprehensive understanding of the issues involved with managing clothing and textile waste on local, regional and global levels.

Mixed Methods Research Design

In order to answer the developed research questions, a mixed methods research design was created. Three different methods were employed for data collection and analysis: (1) unstructured interviews with key informants, (2) exploratory consumer survey and (3) an analysis of secondary data collected from government agencies, public and private organizations and other research institutions. These mixed methods integrate qualitative and quantitative research with secondary data in order to address the research questions.

Secondary Data Analysis

This research began with the analysis of existing secondary data from a variety of agencies and organizations that have collected data on the domestic and international handling and disposal of clothing and other household textiles. Secondary data is informed by the writings and findings of third parties that report on what others have researched (Flynn & Foster, 2009). The U.S. Environmental Protection Agency is frequently cited for its statistics on textiles in the municipal solid waste stream. Information gleaned from secondary data has been incorporated into this research to further highlight patterns and trends.

This secondary data used included statistical sets and reports from agencies on state and national levels related to textile waste, recovery and recycling, job creation, global exports and greenhouse gas emissions in the context of waste management. This data includes findings from agencies including the U. S. Environmental Protection Agency, the Council for Textile Recycling, Secondary Materials And Recycled Textiles, and the Bureau of International Recycling, New York State Department of Environmental Conservation, New York State Association for Reduction, Recovery and Recycling, Bureau of Labor Statistics, U.S. Census and the International Trade Commission. The aforementioned agencies all have an established interest in apparel and textile waste recovery and recycling, as well as in measuring economic and environmental impacts of resource recovery and landfill diversion efforts. Examining the information they provide on this subject gave greater context for understanding problems and solutions related to textile waste.

Interviews and Field Research

Unstructured interviews were conducted with key informants that serve as different stakeholders within the textile recycling system. Ten informants were selected based on their involvement with textile waste, each offering different perspectives on collection issues, market conditions for second-hand clothing commodities, creating new public policies, municipal recovery initiatives and efforts made by the apparel industry, including designers and manufacturers to reduce waste.

A series of interview questions (see Appendix A) were developed to guide unstructured interviews with the key informants. Each interview was conducted in person and when applicable, a tour of any onsite sorting and handling facilities was granted to observe the process conducted by each business. Photographs were taken during all tours to document the process and each interview was recorded and then transcribed for accuracy. A signed consent form was obtained from each interviewee that allowed for the use of their names, businesses and job titles to be used within the text of this study and future dissemination of this research.

Consumer Survey

To further the investigation of textile waste for this study, an exploratory consumer survey was developed to understand the disposal habits and behaviors of consumers related to clothing and household textile waste. With only a reported 15.7% of textiles recovered for reuse and recycling (U.S. Environmental Protection Agency, 2014), 70 lbs per person is disposed of into landfills each year (Council for Textile Recycling, 2014). This suggests that a significant amount of the U.S. population discard textiles into municipal solid waste. Based on these statistics, specific survey questions were developed to gain an understanding about consumer's

self-reported behaviors and habits around their disposal of clothing and household textiles (see Appendix B).

First, respondents were presented with a series of questions about their preferred methods for disposal of textiles, why they disposed of textiles and the frequency of disposal. Respondents were also asked to read statements regarding some of the issues involved with textile waste and to answer whether they strongly agree, agree, neither agree or disagree, disagree, or strongly disagree with statements, using a 5 point Likert-type scale. These statements were developed after a general understanding of the issues involved with textile waste was gained during the preliminary research stage. The statements reflected common public misconceptions of the textile donation process and the textile recycling system. Insight into these misconceptions, challenges and issues was gained during the preliminary research stage by attending events including the New York State Textile Waste Stakeholder Summit, held in Syracuse New York in April 2014 and the International Textile Recycling Summit, held in Miami, Florida in June 2014. Attending these events offered the author access to first-hand data on obstacles that the textile recycling industry face when working to recover textiles. The events also offered insight into information that the textile recycling industry would like to have from consumers that helped to shape the survey. The questions and statements included in the survey were then refined after the completion of several interviews with key stakeholders during the formal data collection process. The survey was designed to discern the climate of understanding among consumers regarding these issues and not as a predictor of behaviors. Demographic data was also collected on gender and geographic location of respondents – whether they lived in New York, or elsewhere in the U.S. Respondents were required to be residents of the U.S. for their answers to be accepted. Gender was documented because the clothing consumption habits of men versus women were

mentioned throughout the research process. The purpose of this survey was to find out how respondents self reported on the issue of clothing and textile waste disposal, as well as to identify any patterns or trends among men or women and also among New York State residents that differed from respondents in other parts of the U.S. The survey was administered through the online survey tool, Qualtrics.

Additional Data Collection-Applied Theory at Work

Finally, additional quantitative data was obtained from waste collected in the design studios in the Fiber Science and Apparel Design Department (FSAD), at Cornell University. The goals of collecting this waste was to quantify textile waste generation per student in the design process in FSAD, and to contribute directly to diversion from landfills and sustainability efforts being made throughout Cornell's campus. This piece of the data collection was designed to understand how difficult it would be to recycle this waste over disposing of it into the trash then destined for landfills.

Four waste collection carts were donated by Cascade Engineer, a plastics injection manufacturer located in Grand Rapids, Michigan to use in the collection of the textile waste generated by instructors and students from the apparel design studios. The waste was collected with the intention of identifying a textile recycler in New York State that would process the waste. Clearly marked Textile Recycling bins were installed in the sewing studios as collection points for unwanted scraps of fabric and muslin as seen in Figure 3.1. Once collected, the textile waste was weighed and then stored on campus, while this research was underway.

Another motive behind this additional data collection was to better understand the process of disposing of pre-consumer textile waste that is generated during design and

production of clothing in the New York City and the rest of New York State. The information gleaned from this process was also anticipated to offer more insight into the amount of textiles ending up in landfills coming from sources other than consumers. During preliminary research, challenges were noted with recycling smaller amounts of pre-consumer textile waste generated from the fashion industry and colleges that practice apparel design.

Figure 3.1 Fabric Waste Collection Bins in Cornell Apparel Design Studios



Photo Source: Autumn S. Newell

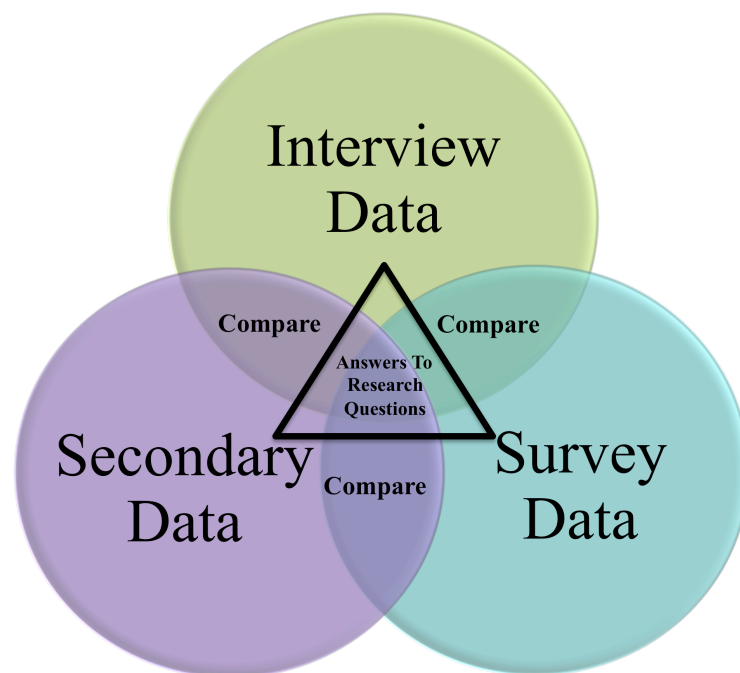
Data Analysis

The transcriptions from the interviews with key informants were uploaded to AtlasTi, a computer program used widely in the analysis of qualitative research data. Word coding was used on quotes from the transcriptions to do a textual analysis of interview data to identify

language trends that may provide insight into the textile waste system. The codes were grouped in four families and mapped out to established relationships between the codes. The mapping assisted in identifying trends that could improve efficiency in the system. Additionally, the physical locations of the interviewees were also mapped out visually.

The data collected from the consumer survey was downloaded from Qualtrics input into SPSS, statistical software. The data was cleaned to ensure that only fully completed surveys were included in the data analysis. In total, 865 survey responses were received, with a 10% dropout rate to the survey, allowing for 780 completed surveys. During the initial data cleaning process, it was identified that one respondent reported residence in Germany and was subsequently excluded; creating a total of 779 completed surveys included in the survey results. SPSS software was used to compile frequencies for each response in order to provide an overall profile of consumer's disposal practices.

Figure 3.2 Data Analysis Process



The secondary data was initially analyzed as a part of the preliminary research process and then reviewed again later to fill in any missing information not provided in the primary data collection. The primary qualitative and quantitative data collected, as well as the secondary data in the form of reports and statistics were analyzed using triangulation in an effort to answer the developed research questions. Figure 3.2 shows the process of analyzing the data to the answer the developed research questions.

Chapter 4

Results and Discussion

Key Informant Interviews

From the beginning of this research process a vast network of interesting connections began to unfold. Attending the Sustainable Textile Summit, hosted by Manufacture New York, in New York City in October of 2013, opened up a network of fashion industry professionals interested in issues of textile lifecycle management. Following that, in April of 2014, the first New York State Textile Waste Stakeholder Summit was held by the New York State Association of Reduction, Reuse and Recycling (NYSAR 3), in Syracuse New York, that brought together many professionals from other areas already involved with textile recycling. Connections made at this summit were integral in establishing a network of informants interested in strengthening New York State's position on textile recycling and landfill diversion. Following that event, the first International Textile Recycling Summit (ITRS) was held Miami, Florida in June of 2014. The event was hosted by the Council for Textile Recycling (CTR) and Secondary Materials and Recycled Textiles (SMART) trade association, as part of the semi-annual recycling convention put on by the Bureau of International Recycling. The ITRS summit sought to bring together international textile recycling stakeholders. Attendees included privately owned businesses, not-for-profits and academics from France, England, Germany, Italy, Denmark, Pakistan, China, Canada and the U.S. who gathered to examine the current state of the textile recycling industry. Attending this event brought to light how state and local initiatives feed into global commodities markets for textile waste and second-hand clothing.

Through the network of connections established by attending these summits on textile waste, ten key informants were selected for interviews as part of the formal data collection

process for this research. The participants were each chosen based on their unique involvement with textile waste in varied settings. Details on the key informants who were included in the sample are listed in Table 4.1. Nine out of ten of the interviewees were based out of New York State (See Figure 4.1). The one outlier, Eric Stubin, has been interviewed for numerous studies, books and media specials about his experience with post-consumer textile waste. His company, Trans-America Trading Co. based in Clifton, New Jersey, is the largest textile sorter in the Northeast and services much of the textile waste generated in the New York City area, making his contribution very relevant to this study. The other nine participants in the sample also offered significant expertise to this study. To highlight some of the sample, Cheryl Campbell can be credited with starting Eileen Fisher's widely successful "Green Eileen" retail take-back program that has collected over 260,000 garments since it launched in 2009. Nir Katz is a fourth generation "rag-man" working for his family company that operates a national and global rag brokerage. Sass Brown is the Assistant Dean of Art and Design at The Fashion Institute of Technology and a researcher who has authored numerous books on the use of reclaimed textiles through up-cycling and refashioning. William Gover is the Vice President of Production and Merchandising for the non-profit, Housingworks, which processes all of textile waste collected through New York City's municipal bin collection program, ReFashion NYC.

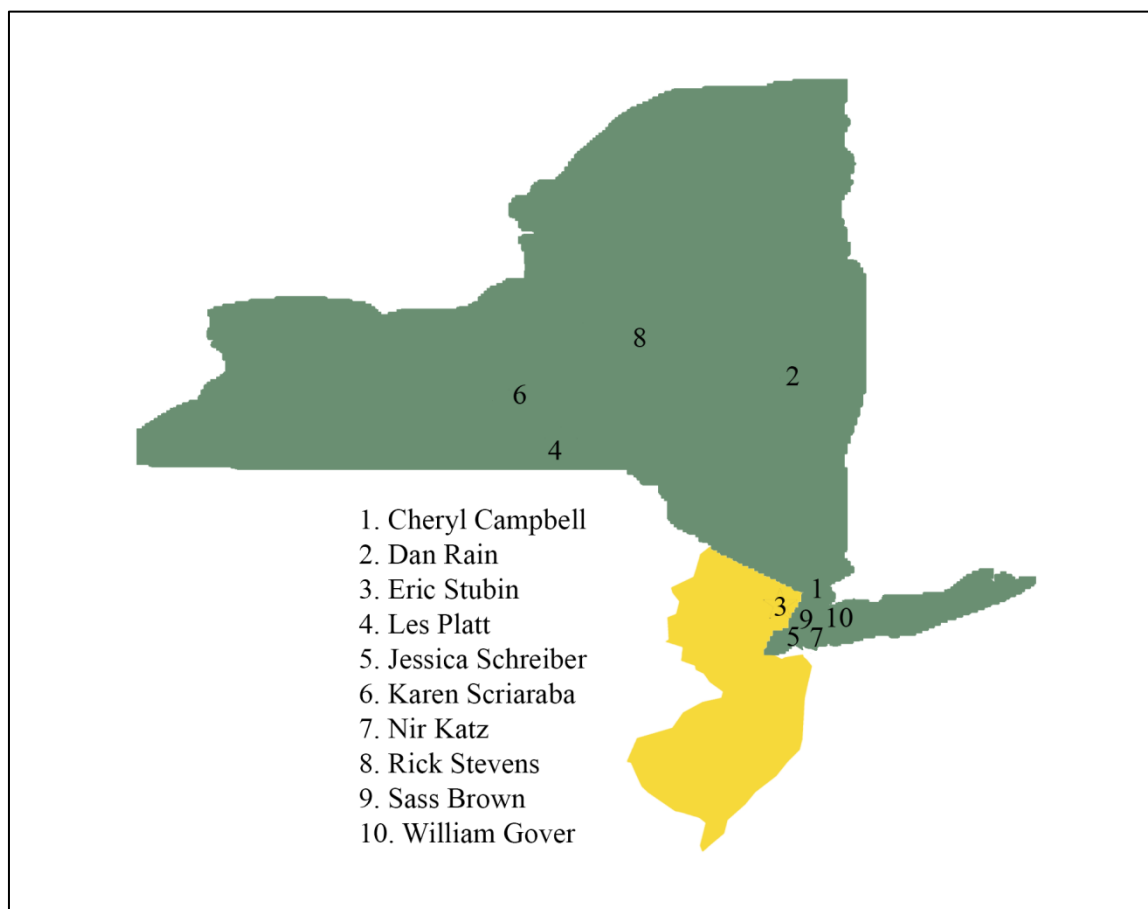
All interviews with key informants took place between July and October of 2014 and were transcribed before being entered into AtlasTi for coding. A series of 28 codes were developed by the author during the data analysis process and grouped together in four families in order to organize them in an effective manner for answering research questions. These codes were developed based on background information gleaned during preliminary research and the

literature review process. From the ten interviews with key informants 126 pages of transcriptions were looked over by the primary investigator beginning the coding process.

Table 4.1 Key Informant Interview Sample

Name:	Company/ Establishment:	Job Title:	Industry Category:	Other Credentials:	Location:
Cheryl Campbell	Eileen Fisher/Green Eileen	Managing Director of the Eileen Fisher Community Foundation	Fashion/Retail Take Back Program	Creator or Green Eileen Take Back Program	Irvington, New York
Dan Rain	Town of Bethlehem	Recycling Coordinator	Municipal Recycling Management	Organizer of New York State Textile Recovery Campaign	Bethlehem, New York
Eric Stubin	Trans-America Trading Co.	C.E.O.	For-Profit Textile Sorter	Council for Textile Recycling-Board of Directors President	Clifton, New Jersey
Les Plat	All County Used Clothes	Owner	For-Profit Textile Collection Bin Operator	Organizer of New York State Textile Recovery Campaign	Binghamton, New York
Jessica Schreiber	NYC Dept. of Sanitation	Recycling Initiative Supervisor	Municipal Recycling Management	Organizer of New York State Textile Recovery Campaign	New York, New York
Karen Scriaraba	Trader K's	Owner	Second-Hand Clothing Resale		Ithaca, New York
Nir Katz	Whitehouse & Shapiro	Director of Strategic Operations	For-Profit Textile Broker	Council for Textile Recycling-Board Member	New York, New York
Rick Stevens	Rick's Rags	Owner	For-Profit Wiper Rags Business		Canastota, New York
Sass Brown	Fashion Institute of Technology	Assistant Dean of Art and Design	Fashion and Fashion Education	Researcher and Author of Books on Innovation with Textile Waste	New York, New York
William Gover	Housingworks	Vice President of Production and Merchandising	Non-Profit Charity Donation, Resale/Sorting Business		New York, New York

Figure 4.1 Geographic locations of Key Informants

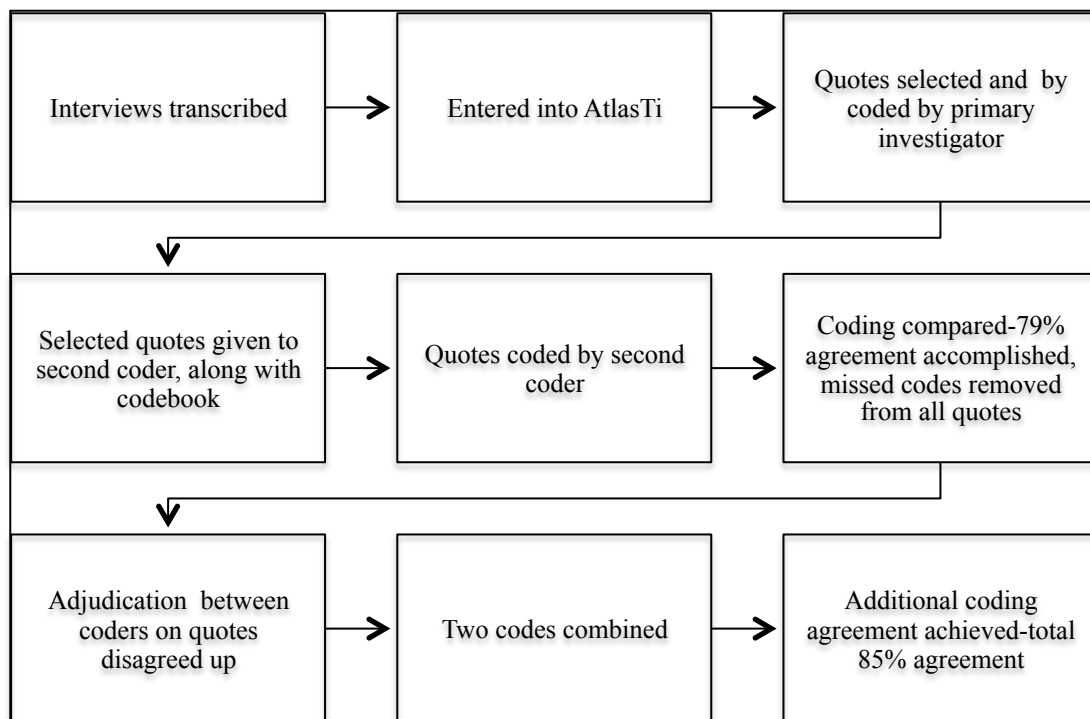


From the analyzed data, 323 quotes were selected because of their relevance to the research and coded with one or multiple codes, again by the primary investigator. Once complete, these quotes were then presented to a second coder to determine inter-coder reliability among the codes. The quotes were given to the second coder in a raw, un-coded state along with a book of codes that defined each one. A simple percentage agreement format based on the percent of quotes agreed upon was used to determine the inter-coder reliability for the data. During the initial round of comparison between the two coders agreement was achieved naturally for 79% (256/323) of the quotes. This percentage included any quotes that were agreed upon initially and coded with one or more of the same quotes and any code that was missed (used by one coder but not both) was dropped from the coding. The two coders then met to discuss and adjudicate about the quotes that did not have any codes in agreement. During the discussion, two

codes were combined to avoid confusion based on a recommendation from the second coder reducing the final amount of codes in the codebook to only 27 codes (see Appendix C). Quotes that were initially disagreed upon were discussed until an agreement was reached between both coders, with a final inter-coding score of 85% (273/323) agreement achieved. The final list of quotes along with their codes can be viewed in Appendix D. Figure 4.2 illustrates the coding process.

The codes were then developed into a series of networks of associations to show their relationship with one another. Some codes appeared in more than one network. The network views provided insight into the overall function of the system. Appendix E and F are examples of some of the original network views.

Figure 4.2 Interview Data Coding Process



Consumer Survey Results

The consumer survey facilitated through Qualtrics survey software was distributed a number of ways seeking out voluntary responses. First, the survey was sent out via email to people within the immediate Upstate New York community of the primary investigator to request participation and further dissemination of the survey. The sample then developed through a “Snowball sampling” method. Snowball sampling is a method used where one or more subjects are initially identified, who then identify more subjects, taking advantage of the social networks of all involved and building an expanded network of subjects for the research (Lewis-Beck, Byrman, & Futing Liao, 2015). From the initial set of contacts the network did indeed, grow and the survey was included on several regional list serves, uploaded to several Facebook pages and forwarded by people making additional requests for participation. The only requirement for participation was that participants reside in the United States, in order to keep the sample concentrated. The residency requirement was also required in an effort to gather data that could be used in comparison to the secondary data included in the study that focused primarily on the United States. A total of 632 voluntary responses were obtained through this organic network approach to primarily reach New York State residents. At the same time that these responses were coming in, the survey was uploaded to Amazon Mechanical Turk in an effort to diversify the sample of respondents and gain some national participation. Through the Amazon Mechanical Turk service, an additional 233 respondents were paid \$0.25 each for their participation from a variety of states. As mentioned in the analysis portion of Chapter 3, a total of 865 surveys were obtained, providing 779 fully completed and eligible surveys for the included in the final sample after the data was cleaned. The survey link was active from October 1st to November 15th, 2014.

Sample

For the demographic data where $n=779$, 81% identified as female ($n=631$) and only 19% as male ($n=148$). Of those, 367 females and 50 males reported to be residents of New York State (Table 4.2). The mean age group of both male and female respondents was between 26-40 years old. (Table 4.2). The mean age group was the same for New York state residents and residents of other states reported.

Table 4.2 Age Group, Gender and Residency

Age	Gender		New York State Resident?	
	Male ($n=148$)	Female ($n=631$)	Yes ($n=417$)	No ($n=362$)
Under 18	0	3	3	0
18-25	13	58	28	43
26-40	68	236	151	135
41-55	42	153	104	91
56-70	21	164	118	67
Over 70	4	17	13	8

Survey

An index of textile recycling behaviors was created based on the questions around disposal habits and behaviors. Based on their responses, participants received a score between 0-7 (0 being the lowest, 7 being the highest) based on the ways they engage the recycling behaviors outlined in the questions. Women scored significantly higher with a mean score of 3.36, while men had a mean score of 2.54. Based on this sample a T-test was run to determine statistical significance and significance was found to indicate that there is a difference between the amount of textile recycling that men and women practice, with women showing that they recycle clothing more. The same index of recycling behaviors was run to see if there was a difference between the score of New York State residents versus residents from other states and statistical

significance was also found indicating that based on this sample, New Yorkers do indeed recycle textiles more than that in other states reported. Table 4.3 show these results.

Table 4.3 Statistical Significance for Gender and State Residence

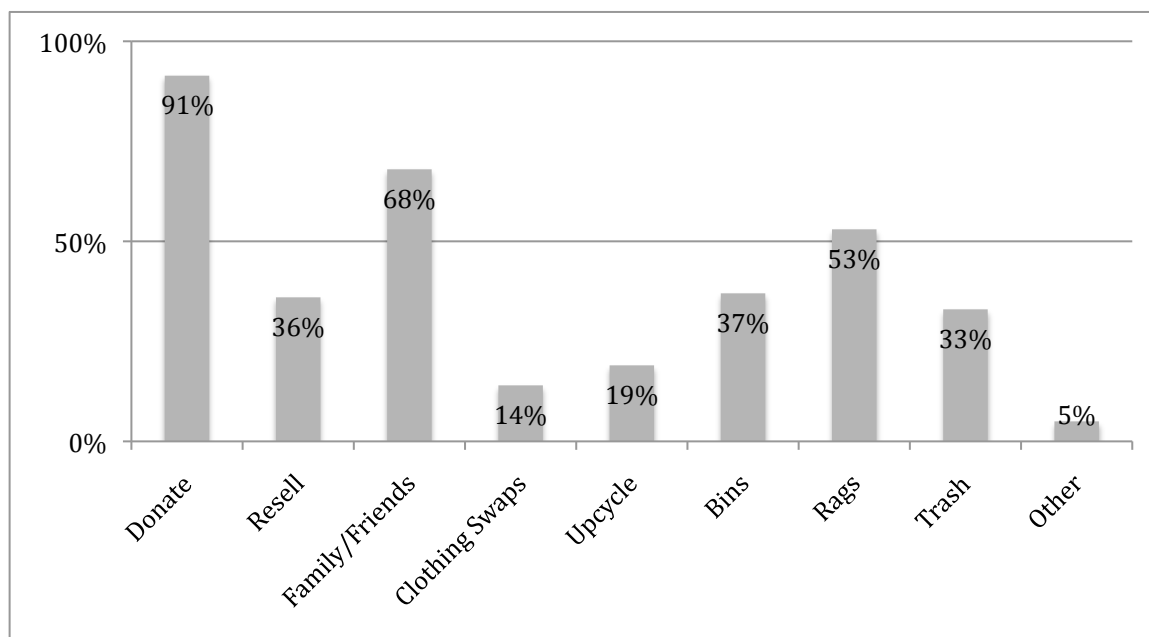
	Women (n=631)	Men (n=148)	Test Statistic	p-value
Clothing Recycling Index	$\bar{x} = 3.36$ (0.058)	$\bar{x} 2.54$ (0.098)	$t = -7.171$	$p < 0.001$
Clothing Disposal Method: Trash	n=209 (81.3%)	n=48 (18.7%)	$\chi^2 = 0.026$	$p > 0.001$
	New York State Residents (n=417)	Non-New York State Residents (n=362)	Test Statistic	p-value
Clothing Recycling Index	$\bar{x} = 3.51$ (0.071)	$\bar{x} = 2.85$ (0.071)	$t = 6.565$	$p < 0.001$
Clothing Disposal Method: Trash	n=115 (44.7%)	n=142 (55.3%)	$\chi^2 = 11.89$	$p = 0.001$

For each question that was included in the development of the textile recycling behavior index participants could choose all the ways in which they disposed of unwanted clothing or household textiles, besides discarding them in the trash. The most commonly reported method for clothing disposal was to donate it to charity with 91.4% of respondents reporting participating in this action. Other popular methods for disposal included giving it away to family and friends and cutting items up to be used as rags. Only 33% of respondents reported that they actually throw clothing out into the trash. Figure 4.3 illustrates these results. Some respondents

selected the option for other forms of disposal (see Appendix G for complete list of text entries). Respondents were allowed to select as many disposal methods as they wanted.

The results for the same question were also separated for New York State and non-New York State residents who reported these activities. The results showed that of those who reported that they discarded textiles into the trash, 44% of them were New York Residents while 55% reported residency in 39 other states. A Chi-square test was run to test the significance of the results for New York State residents and significance was again found.

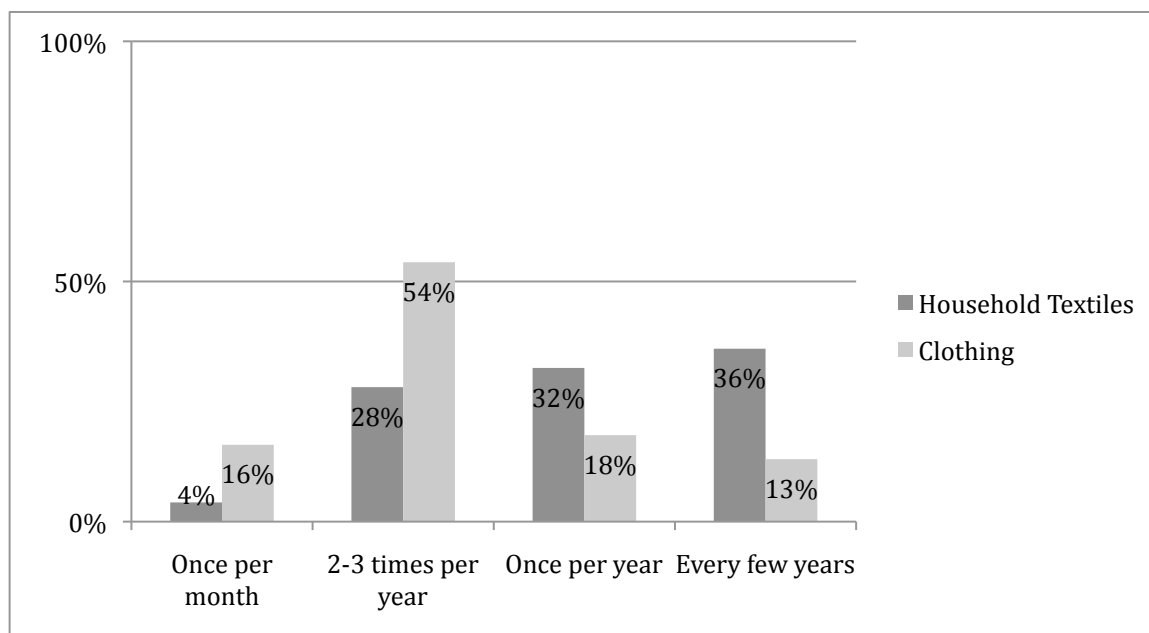
Figure 4.3 Consumer Textile Disposal Methods



Results from the question regarding the frequency in which respondents discard either clothing or household textiles showed that clothing is discarded more frequently than household textiles. It was also found that for household textiles, where $n = 779$, 54% of respondents reporting they discard of clothing 2-3 times per year, whereas the majority, 36% of respondents

reporting disposal of household textiles only every few years. Figure 4.4 illustrates these findings that clothing is disposed of more frequently than household textiles.

Figure 4.4 Frequency of Textile Disposal



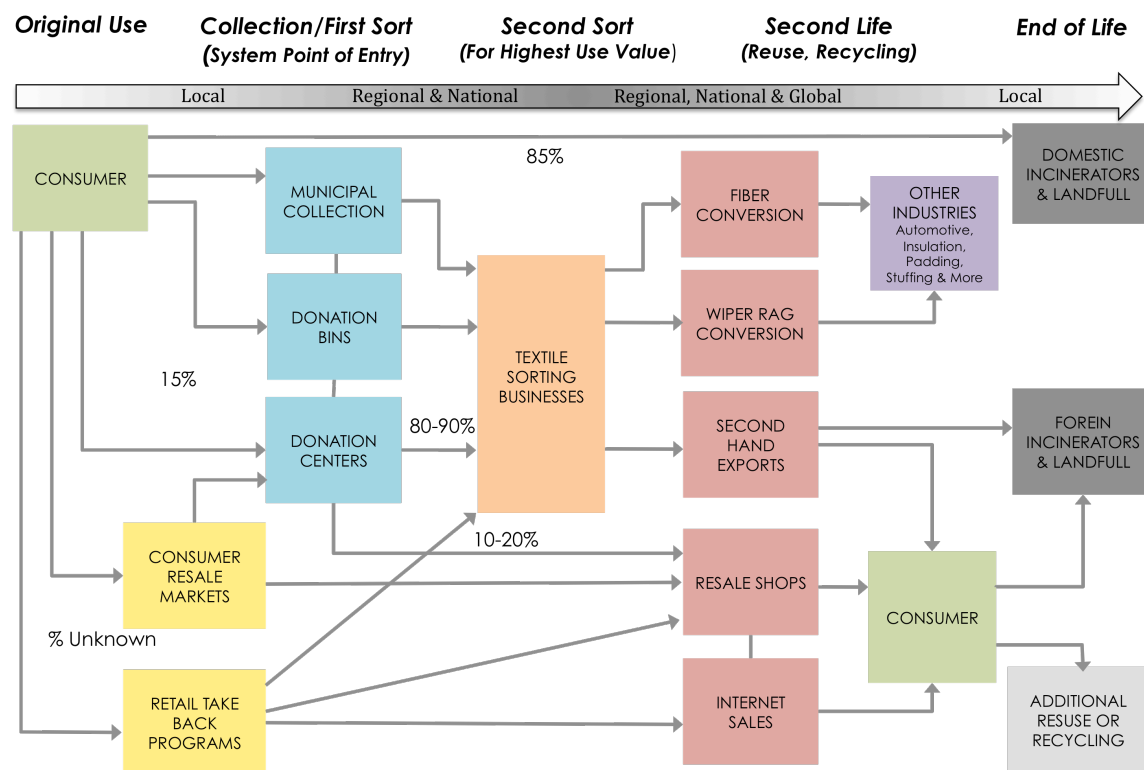
Answers to Research Questions

A large amount of qualitative and quantitative data was collected between the two samples that were then applied to answering the four established research questions. As a case study of New York State's textile recycling system, this research took an inside-out approach to looking at the problem of textile waste. Data collected from the stakeholders within the textile recycling system focused on understanding the function and complexities of the existing system, while data gathered from the consumer survey was applied to understanding how the public interacts with the system.

Question #1-Answer and Discussion

Much of the preliminary research and the key stakeholder interviews assisted in answering the first research question **R1: What is the existing system in place for recovering and handling textile waste in New York State?** Figure 4.5 was developed based on knowledge gained during the literature review, preliminary research and formal data collection process in order to illustrate the flow of materials through the textile recycling system.

Figure 4.5 Post-Consumer Textile Waste Flow of Materials



Until Hawley (2000, 2006) began to investigate the system of textile recycling, no research existed to understand the various players involved with the textile recycling industry. The results from the qualitative information gathered from key informants confirms Hawley's

early research and the data presented her original system map, but it also shows that over the past decade additional stakeholders have gotten involved with the textile waste recycling system.

Beginning with the consumer, there is a five-stage system lifecycle for clothing and household textiles that become post-consumer textile waste. Post-consumer textile waste follows the flow of materials through the textile recycling system, once it is introduced through a variety of entry points that serve to divert it from landfills for reuse and/or recycling purposes.

According to the literature reviewed for this research, an average of only 15% of unwanted textiles are making their way into the First and Second Sort stages of the system, while an average of 85% is being discarded directly into landfills. Additionally, an unknown amount of post-consumer textile waste is resold more directly for reuse to consumers of second-hand goods which are suitable for Second-Life stage, through various, growing resale markets. The Second-Life stage also includes textiles that are converted to other fibers or cut-up for wiping rags, which give them another use-cycle before they are also eventually disposed of. Inevitably, there is some post-consumer textile waste that enters the system for recycling that is deemed unsuitable for reuse or recycling and gets discarded into the landfill. This amount is estimated to be less than 5% of the 15% that is recycled (Council for Textile Recycling, 2014).

The New York State textile recycling system begins on a local level and then feeds into a regional, national and global exchange of materials that eventually land in new local destinations. New York State's system is representative of national and international textile recycling systems, but is unique in that now there is a coalition of stakeholders actively working to strengthen the state's position on textile recovery and landfill diversion. Organized by the New York State Association for Reduction, Reuse and Recycling (NYSAR 3), these stakeholders launched the ReClothe NY campaign to raise awareness about textile recycling and to make

strides in diverting more textiles from landfills. The campaign launched in November of 2014 and has seen some traction but is still under development in terms of its approach to public outreach. The success and impact of the campaign will be demonstrated over time.

Although the textile recycling industry has existed for over a hundred years with its “rag-men” recovering clothing and other textiles, the network of the system’s stakeholders has expanded due to the volume of textile waste currently discarded, into both the municipal solid waste streams and the textile recycling system. Most notably, the fashion industry as well as local governments and municipalities have partnered with the textile recycling industry in efforts to divert more textiles from waste streams for recycling and reuse purposes.

Retail Take-Back Programs

Retail take-back programs run by the fashion industry have begun to be more popular in recent years. The trending model for these take-back initiatives programs is for an organized partnership to be formed between fashion brands and for-profit sorting businesses. Fashion brands incentivize in store drop-off recycling through coupons and discounts. The textile waste that is collected is then sold off from the fashion brand to the sorter, where it is processed and sorted for its highest use-value. This is the model used by the major fast fashion retailer, H&M, in their partnership with I:Co, highlighted earlier in the literature review. This is growing model and similar programs and partnerships are being developed throughout the textile recycling and fashion industries.

However, there are other scenarios for take-back programs like the one run by the Eileen Fisher brand, known as Green Eileen. Under their model, Eileen Fisher garments are collected, sorted and resold exclusively within the company’s retail stores and at pop-up sales with the

profits going to benefit the brand's in-house charity, the Eileen Fisher Community Foundation. Spearheaded by Cheryl Campbell, Eileen Fisher—an international fashion brand with headquarters in Irvington and New York, New York—established this unique take-back program exclusively for their brand in connection with the company's foundation. The program was designed so that unwanted Eileen Fisher brand clothing can be returned at all Eileen Fisher stores in exchange for a \$5.00 reward card towards customer's next purchase. Collected items are then returned to one of two in-house processing facilities—one in Washington state to service the west coast and one in New York State to service the east coast—where garments are sorted, cleaned, repaired and prepped for resale as Green Eileen products in one of several dedicated Green Eileen stores or at certain Eileen Fisher brand stores. The garments are sorted into three categories: 1st life which are cleaned and resold as is; 2nd life that are repaired or up-cycled into new garments and 3rd life items which are deemed unsuitable for resale but are given away to outside organizations such as homeless and battered women's shelters who redistribute the clothing for free to people in need. The money generated from the sale of Green Eileen garments is then used to fund the many programs for women and girls that the Eileen Fisher Community Foundation provides support for. Community grants are also administered to many eligible applicants.

The Eileen Fisher brand created Green Eileen with a dedication to collecting and processing the company's textile waste itself. While the model is strong, unique and very forward thinking for a fashion brand, there are still challenges for the company that lie within handling the volume of garments coming back for processing. Since launching in 2009, the program has collected over 200,000 garments. Although Eileen Fisher is known for classic, timeless garments that are extremely well made out of beautiful fabrics, the brand estimates that

at least 50% of the items received from the Green Eileen program are damaged, posing huge challenges to the team in charge of processing them. The volume and condition of the clothing has forced the brand to work diligently to stay ahead of its processing and be creative in finding appropriate ways to market and add value to the second hand goods within the company.

The Eileen Fisher brand has demonstrated its ability to practice extended producer responsibility for its products through the Green Eileen program, as well as incorporating a charitable component. The brand demonstrates a strong commitment to growing sustainability initiatives in both new garment production and textile waste reduction. Through the experience of the take-back program, Eileen Fisher has also begun to rethink what growth means and has actually reduced the amount of fibers they use and the number of designs they are offering in an effort to focus the company and pull back a bit, despite huge success and growth over their 30 years in business (C. Campbell, personal communication, July, 2014).

Municipal Involvement

Local municipalities involved with textile recycling can choose to support either for-profit or non-profit sorting/collection businesses depending on the collaboration. During the interview with Dan Rain, the Town Recycling Coordinator of Bethlehem, New York, he was quoted saying:

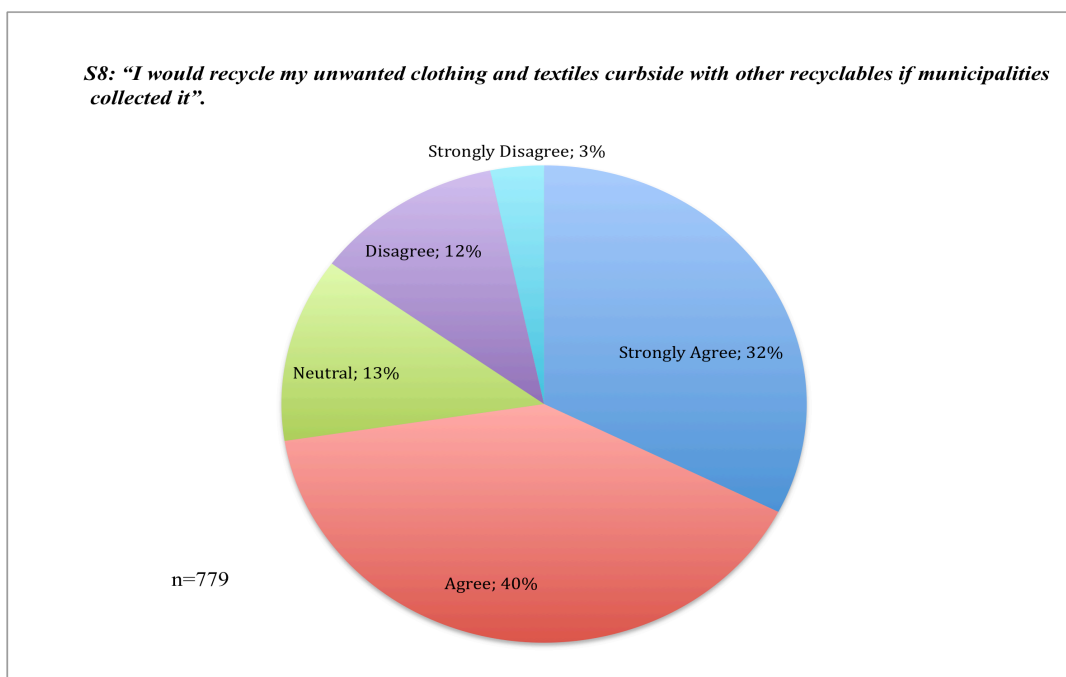
“I think philosophically that municipalities like to work with non-profits. I mean we’re non-profit. Governments are non-profit to begin with, and our mission is to serve; rather than a profit motive. All things being equal, if we had a choice of a well organized, efficient, dependable for-profit company versus a nonprofit who could provide the same

level of service, we'd probably choose a non-profit". (D. Rain, personal communication, June 20th, 2014)

The New York City Department of Sanitation followed this principle by choosing to work with the charity Housingworks, as its collaborator in the Refashion NYC collection program. In the past, the Department organized events with a larger network of charities and thrift stores, but eventually decided to focus textile waste collection operations exclusively with Housingworks to make the process streamlined, convenient and more effective (J. Schreiber, personal communication, July 8, 2014).

Another way for municipalities to collect textiles is through curbside recycling programs. Respondents to the consumer survey showed strong support for the statement S8: *"I would recycle my unwanted clothing and textiles curbside with other recyclables if municipalities collected it"*, 32% strongly agreeing and 40% agreeing to the statement as seen in Figure 4.6.

Figure 4.6 Responses to Survey Question #8



On the issue of convenience, the idea of curbside textile collection is something that has been researched and explored in numerous studies and is currently being practiced in Madison county of New York State. Residents of Madison County can place unwanted textiles out in a clear plastic bag on top of or next to their recycling bins during any recycling pickup. The program has been successful and demonstrates another way that municipalities are becoming increasingly committed to diverting textile waste. The success that the mentioned municipalities have experienced through their different approaches to diverting textile waste from landfills, shows that there are numerous ways to add textile recycling to existing recycling programs.

For-Profit Sorters

Based on the data collected for this research, the strongest part of the overall system has been determined by the author to be the for-profit sorting and collection businesses that serve as the anchor of the entire system. These sorters support their non-profit counterparts, fashion industry partners and other business that provide industrial feedstock to other industries. These businesses deal with textile waste as a bulk commodity, normally by truckloads of 25,000-40,000 lbs. They purchase what is known “Institutional” textiles consisting of textile waste that is left over from what has been donated to non-profit organizations, in excess of what the donation center has deemed suitable for their resale shops. For-profit textile sorters also purchase what is referred to as “Credential” loads of textile waste consisting of untouched materials that have been collected by either non-profit organizations or private business operators that collect post-consumer textile but do not sort it. Credential is also what gets collected and purchased from fashion brands when collected from retail take-back initiatives and partnerships.

Institutional and Credential textile wastes are purchased by the pound, but loads of Institutional have a lower monetary value because they have already undergone a first sort stage by the organization they were donated to as illustrated previously in Figure 4.5 (p. 59). By the time Institutional loads reach the sorters, they are in the second sort phase of the system. Whereas Credential loads command a higher price per-pound because they have not yet undergone a first sort, allowing the load purchaser access to more of the undiscovered valuable items that may be included in the load. Once in the hands of the profit business, Credential and Institutional are mixed together, sorted for the highest use value and then resold again in bulk, entering their second life where they are reused or recycled and converted into other products. Figures 4.7-8 shows photographs of the sorting floor inside Trans-America Trading Co, located in Clifton, New Jersey, as well as bales of sorted clothing loaded into a shipping container headed for international export. International exports of second-hand clothing for reuse to developing countries typically provide the largest return on investment for these sorters. The sale of less desirable post-consumer textile waste to companies who cut them into industrial wiper rags or convert them into what is known as “Shoddy” fibers used for stuffing and insulation, helps the sorters to recover more of their investment, even though this does not provide the same returns.

The Stubin family has owned and operated Trans-America for decades and has seen the market for textile waste grow and change with time. For-profit textiles sorters like Trans-America effectively close the loop during the textile recycling process by being a facilitator for materials to move through the system quickly and be put back into use as apparel, wiper rags or converted fibers. When speaking about the textile recycling system Stubin stated “Our goal as an industry is to take a material that’s currently only diverted somewhere in the neighborhood of

15% and try to push that up somewhat significantly” (E. Stubin, personal communication, June 24, 2014).

Figure 4.7- Inside Trans-America Trading Co.



Photo Source: Autumn S. Newell

Figure 4.8- Conveyer-Belt Sorting (Left) and Bales for Export (Right)



Photo Source: Autumn S. Newell

Stubin believes that in order to increase diversion, participation from the fashion industry is critical. Strengthening the textile recycling system and increasing diversion rates was a concept brought up numerous times throughout interviews with many key informants. The following quote from Dan Rain, an organizer of the ReClothe NY campaign sum it ups best:

“We can get all the stakeholders together; the for-profits, the non-profits, the collectors, the processors, municipalities, higher education, apparel industry, retail. Through collaborative efforts we can really address the issue”. (D. Rain, personal communication, June 20th, 2014)

Question #2-Answer and Discussion

Both the interviews with key informants and the data collected from the textile waste collection process performed in the apparel design studios on Cornell campus were critical to answering **R2: Is there fragmentation within the existing textile recycling system that can be improved to increase efficiency?** There were only two direct quotes regarding the system’s actual efficiency or inefficiency, both mentioned during an interview with Eric Stubin, CEO of Trans-America Trading Company who stated:

“ Anytime you have private sector industry recycling involved in something, obviously you know it’s an efficient industry”. Stubin later went on to say:

“It is an extremely efficient industry and one that is essentially looking to foot all of the cost, in my sense of it. We can’t do it alone. We need the apparel industry. If you looked at what their costs might be, I mean from a messaging and marketing standpoint, it’s a fraction of what our costs are. There is this global reverse, robust supply chain, that’s

continually looking for the new raw material” (E. Stubin, personal communication, June 24, 2014).

Unfortunately besides these two quotes, there were no other direct references to the efficiency of the system so the code for it was dropped from the final codebook. However, because of the Mr. Stubin’s role as Board President for the Council for Textile Recycling and the Stubin family’s multi-generational involvement and with textile waste for over 70 years, these two quotes have been applied to answering research question #2.

The codes titled “Fashion Industry” in reference to the involvement of the fashion industry and “Consumer Education/Awareness/Power” in reference to consumer impact on issues of textile waste were used the most frequently of the final 27 codes (see Appendix C for codes and their frequencies). The frequency of these two codes suggests that they are both areas where efficiency can be improved. “Consumer Education/Awareness/Power” code was used more frequently than other codes, a total of 44 times, in quotes from nine out ten key informants, strongly indicating that consumer participation is essential to system’s efficiency. Consumer participation is what allows for post-consumer textile waste to enter the system and is the starting point for diverting materials from landfills.

The code for “Fashion Industry” was used 32 times in quotes by six out of ten of the key informants. The quotes varied in their references with some pointing to the fashion industry as being generators of textile waste and culprits in the overall problem of textiles in the waste stream. While others indicated that participation and involvement of the fashion industry would contribute greatly to finding solutions for addressing the problem of textile waste. These results suggest that more involvement by fashion industry in the form of extended producer responsibility, designing for garment end-of-life and recycling and increasing take-back

programs can also improve input of materials into the textile recycling system for processing. Speaking from the perspective of New York City's Dept. of Sanitation, this statement was made by Jessica Schreiber: "I would like to see the manufacturing side more involved with in the end of life of what's happening" (J. Schreiber, personal communication, July 8, 2014). This is another sentiment that was reiterated in several times across interviews. Sass Brown, a researcher and expert using reclaimed materials stated: "I think there's another really great opportunity, particularly for manufacturers and retailers that has not been explored honestly at all and that is them using their own waste" (S. Brown, personal communication, September 19, 2014). Because of New York City's position as one of the four fashion capitals of the world, there is indeed a significant opportunity for cultivating fashion industry involvement in addressing both pre and post-consumer textile waste.

Barriers for Pre-Consumer Textile Waste

Antonucci (2012) did a study that looked at designers in New York City's garment district to gauge interest in establishing a fabric collection and recycling program and found there was significant support for such an initiative. There was significant interest from both designers and the New York City Dept. of Sanitation in a pilot program developed during the study, but a successful, long-term program was not formally established.

The results from the data gathered around the collection bins in Cornell's apparel design studios indicate that there are significant barriers for smaller amounts of pre-consumer textile waste to enter the textile recycling system. These barriers are indicative of another inefficiency within the textile recycling system that was not expressed in stakeholder interviews. Through the practice of collecting the textile waste from the Cornell design studios, in the Fiber Science and

Apparel Design department, it was revealed that these materials are difficult to recycle. Over the course of two semesters a total of 557 pounds of pre-consumer textile waste was collected from the studios for recycling. Of that amount, 89 pounds was sorted out of the waste, deemed reusable and then donated to SewGreen, a unique not-for-profit textile resale store located in Ithaca, New York. The remaining 468 pounds was stored while efforts were made establish a connection with a fiber converter in New York State that could transform the unusable scraps into the material known as “shoddy”. Fiber Conversion Inc. was located in Broadalbin, New York who agreed to process the materials. However, transporting the fibers—because the amount was less than a truckload (LTL freight)—would pose more challenges. The Fiber Science and Apparel Design Department at Cornell agreed to grant a small allowance for the transport of these materials from Ithaca to Broadalbane, but a long term recycling relationship between the department Fiber Science and Apparel Design and Fiber Conversion Inc. was still being worked through at the time of this Thesis publication.

This process revealed several important points: (1) small businesses or academic institutions interested in recycling their waste must be able to store materials and pay for the transport of smaller amounts of textile waste (2) pre-consumer textile waste that is not recycled is contributing to the total amount of textiles in landfills because small amounts are more difficult to get processed for recycling for logistical reasons.

Question #3-Answer and Discussion

A total of 20 quotes from the interview were coded as “Economic Value” during the analysis and were applied to answering **R3: Could expanded resource recovery efforts of textile waste contribute to economic development, job creation and reduced environmental**

impact? These quotes discussed the economic value that textile waste holds when recovered for reuse and recycling. In conversations with key informants more significant emphasis was placed on economic impact than environmental impact of textile waste recovery can have. However, the results from all of the data analysis indicated there is significant positive impact to be gained in both environmentally and economically. The code for “Textile Recovery/Landfill Diversion” was used for 10 quotes and was subsequently linked to 9 other codes as the central point of conversation for stakeholders due to the economic and environmental impact it causes.

The New York State Association for Reduction, Reuse and Recycling has been working alongside the Council for Textile Recycling and Secondary Materials and Recycled Textiles in the development of the statewide textile recovery campaign, ReClothe NY, to increase textile diversion from landfills to recover the economic value and reduce environmental impact. According to Nir Katz, a board member for the Council for Textile Recycling, the New York State campaign is the first of its kind in the U.S. that has engaged various stakeholders to work together in a cooperative effort to recover and divert textiles from landfills. The stakeholders include government agencies like the Department of Environmental Conservation, local municipal waste and recycling managers and players in the textile recycling industry, including charities and private businesses. One of the goals of the campaign is to educate the public on what materials are acceptable and to increase collection. Specifically, educating the public that items that are worn, torn, stained and not in perfect condition are still suitable donations that will be processed and sorted for reuse or recycling. Another goal is to make recycling textiles easier and more convenient for the public so that recovery rates can be increased benefiting all of the involved stakeholders.

Economic Development

Textile recovery and landfill diversion comes with significant economic opportunity. Economic opportunity was indicated as financial resources available to many stakeholders involved in the textile recycling system by way of recovering additional textile waste for reuse and recycling purposes and selling it to generate money. This money can then be used to support philanthropic pursuits and charitable community missions, or to generate profits for business owners or create new jobs in areas of waste management. “If you look the issue here, if we increase diversion from 15-20% and you just multiply that times the 25 billion pounds (recovered), it is a significant number that makes a significant difference” (E. Stubin, personal communication, June 24, 2014).

Many of the key informants interviewed and the organizers and stakeholders of the ReClothe NY campaign see this as an extraordinary opportunity that can be realized through both environmentally and economically inviting consumers, the fashion industry and municipalities to all join in improving textile recovery and landfill diversion rates. “Outside of more the legitimate charities, there are companies or there are not-for-profits that have been setup whose stake in the mission is to keep textiles out of landfills” (N. Katz, personal communication, July 10th, 2014). Expounding on the economic value that textile waste possess for companies and individuals Jessica Schreiber states: “The growth of that (collection companies), really speaks to the fact that this material doesn’t need to go to the landfill if people are investing resources to collect it and make this their business model” (J. Schreiber, personal communication, July 8, 2014).

The economic opportunity associated with textile waste collection and landfill diversion can provide opportunities for significant job creation. According to New York State Association

for Reduction, Reuse and Recycling, the 1.4 billion lbs of textiles estimated to be disposed of in landfills in New York State costs the state about \$35 million landfill tipping fees that could be recovered for use elsewhere in the state’s economy. The U.S. Census reports that the population of New York State in 2014 was 19,476,227 with 15.3% of the population—2,979,863 people living below the poverty level, and an unemployment rate of 4.5%. The Bureau of Labor Statistics classifies jobs in recycling as “Green Jobs” and the reported mean hourly wage is \$16.96, with a mean annual income of \$35,280 for workers in the field. According to a report published by the Tellus Institute, titled “More jobs, less pollution” that addresses job creation in recycling industries, the recovery, processing and reuse of textile waste creates 14.85 jobs per 1,000 tons of waste, much more than collection and incineration or landfill disposal, which create only 0.76 jobs per 1,000 tons (2011). When this is applied to the estimated 700,000 tons of textiles annually discarded in New York State (New York State Association for Reduction, Reuse and Recycling, 2014), this translates into 10,395 jobs that could be created through the recovery and recycling of this waste. Table 4.4 illustrates these numbers. This data supports that increased recovery could provide job opportunities in waste reduction for many in need of livable wage, working class jobs for New York State residents.

Table 4.4. Waste Management and Job Creation

Industry	Tons of Waste	Potential Jobs Created
Landfill Disposal Jobs	1,000	0.76
Landfilling NYS Textile Waste	700,000	532
Recycling Jobs	1,000	14.85
Recycling NYS Textile Waste	700,000	10,395

Reduced Environmental Impact

There were not as many quotes coded for “Environmental Impact” within the interview data that pointed to the environmental effect that recovered textiles could have. This code was used only five times therefore the secondary data was referred back to understand the significance. Textiles were not included in a 2008 report on the environmental benefits of recycling published by the Bureau of International Recycling, but the area of textile recycling has gained a prominent position on the agency’s website. The increasing prominence of textiles was also indicated by the addition of the International Textile Recycling Summit at Bureau of International Recycling convention in June 2014. The Bureau of International Recycling states that the reuse of recovered textiles has implications for both manufacturing and consumption cycles that can decrease Carbon Dioxide (CO₂) production, water consumption and the use of fertilizers and pesticides (2015). According a report published in 2014 by the U.S Environmental Protection Agency, titled *Green House Gas Inventory Report* the waste management industry is responsible 1.9% of overall greenhouse gasses being released into the atmosphere from activities in the United States, but they are also responsible for 18% of total U.S. Anthropogenic Methane (CH₄), making landfills the third largest producers of Methane. Further, Methane is the second most prominent greenhouse gas released into the atmosphere, behind Carbon Dioxide (CO₂) but is actually a much more powerful greenhouse gas on a per molecule basis (Wuebbles & Hayhoe, 2002). Methane has a shorter lifespan than Carbon in the earth’s atmosphere lasting only about 21 years but is a much more potent greenhouse gas because it resides closer to earth’s surface and traps radiation more effectively. Methane is thirty-four times more powerful than Carbon Dioxide (Klein, 2014) and has the power to warm the earth much faster than other greenhouse gasses, which could speed up climate change. This information assists in the answering

conclusively that increased recovery and landfill diversion of textile waste can indeed have a reduced environmental impact.

To expand on all options for reducing the environmental impact of textile waste, besides diverting textiles from landfills, there are other options as highlighted in the literature review under the municipal solid waste hierarchy. According to the New York State Department of Environmental Conservation 10 of the 86 nation-wide waste-to-energy plants are located in New York State. This suggests that increasing the incineration of textiles is a more viable option for landfill diversion in New York State than in many other states. This process allows for energy recovery through incineration, which is another way to reduce methane released into the earth's atmosphere. Similar to this, the option exists to harvest methane from landfills to be used for landfill gas energy generation, capturing the Methane and Carbon Dioxide generated during the anaerobic digestion process instead of allowing it leak into the atmosphere.

Question #4-Answer and Discussion

Answering the final research question proved to be a more difficult task within the research process due to the availability of hard numbers on materials that are processed within the state. A solid quantified answer was not reached for **R4: How much of New York State's textile waste can be processed locally and regionally, versus shipped elsewhere or overseas?** Data gathered from the interviews and the consumer survey did not lead to answers for quantifying exactly how much actual waste could be processed within the state. What did emerge from the interview data was a comment that solidified the complexity and fragility of the system, as mapped out previously in Figure 4.5. During an interview with Rick Stewart, owner of Rick's Rags in Canastota, New York, he explained that although his wiper-rag business serves local and

regional businesses, its survival is dependent on the economic returns provided to the for-profit textile sorters through exports. When discussing exports Rick made two interesting points regarding exports:

“That’s the key part of the market (exports). It always has been. And as long as the countries that they (sorters) have are willing to pay the price that they need to keep them alive” (R. Stewart, personal communication, October 16th, 2014).

During the conversation, Rick also explained that what is sorted by the for-profit textile sorters for the wiper-rag market that he called the “rag-out” is a way of covering their costs with slim profit margins. This finding signifies how interconnected the textile recycling system is and that although the exports of second-hand clothing is controversial, they are an important piece of maintaining the vitality the overall system in New York state and elsewhere. This finding also indicates that local and regional textile recycling system and potential for economic development cannot be separated from the globalized economy without consequences.

Exports

Because a concrete and quantifiable number was not obtained through the interviews with the key informants, the secondary data was referred in an attempt to construct an answer to this question. The big business of exports is evident when looking at the secondary data. The International Trade Commission reported the export of “Worn (used) clothing to be just under \$718 million from the U.S., with total exports weighing in at 769,008,278 kilograms the equivalent of nearly 1.7 billion lbs of textile waste for the for year ending January, 2015. If exports were no longer an option for processing textile waste and New York State were responsible for processing an amount reflective of its percentage of the total U.S. population—an

additional 6%—this would be equal to an additional 102 million lbs of textile waste and over \$43 million in revenue to make up through the resale and processing of these recovered materials statewide. When looking further into details on export restrictions by the International Trade Administration, of the 59 countries listed under Worn (Used) clothing, 32 of them had restrictions or bans on imports of these goods.

Although it was not possible to quantify how much waste is and can be processed locally, and regionally, these figures provide some context for what the New York State textile recycling system would be facing if it had to process locally what is exported globally. This raises interesting issues and concerns around the efficiencies of the output of the textile recycling system. If more materials are flowing into the system, logically more materials will need to flow out of it. Output from the system was a concern stated by one key informant and private collection bin operator Les Platt, who implied that scrap industries have a history of being boom and bust economies when markets get flooded with materials and have not place to go (L. Platt, personal communication, June 27, 2014). Acknowledging that many foreign borders have been closed to textile waste exports, Platt's solution for output for efficiently processing more textile waste is to open markets in new countries for second-hand clothing exports, suggesting that the materials are needed and wanted in many regions of the world.

Other Emergent Themes from Research Data

During the preliminary research process and formal data collection aspects of this research, a few other key themes emerged. These issues emerged from the data collected, in addition to the information that was used to answer the research questions. These concepts were

reflected in the literature, interviews with stakeholders and consumer survey results and therefore command reporting as additional results from this research.

Clothing Quality and the Resale Industry

An issue that came up frequently was the quality of clothing entering the textile recycling system. The codes for the Clothing Quality (13 quotes), Volume of Textile Waste (15 quotes), Fast Fashion/Disposable Clothing (14 quotes), and Resale Industry (12) codes were also frequently referenced in the interviews often linked together in reference to the clothing entering the textile recycling system during interviews with key informants.

The quality of used clothing available to the resale industry was indicated to be to both better by some and worse by other informants, but was mentioned in many of the interviews. Small business owner Karen Sciarabba of Trader K's in Ithaca, New York, noted the quality of clothing coming into her buy-sell-trade resale store has improved over the years stating "We're seeing those items come in a lot more frequently like Coach or Armani or Boss, the higher end stuff" (K. Sciarabba, personal communication, October 26, 2014). While on the other hand, from the perspective of a charitable donation center, the volume of lower quality clothing, particularly fast fashion has been increasing. William Gover, the Vice President of Production and Merchandising for Housingworks states "Honestly, with this disposable stuff, I don't know what's going to happen because we can't sell H&M, maybe it has a tag on it but it's not worth our time". He later went on to say this:

"You can sell that sweater yourself right now with the click of a button. The proliferation of second hand stores that purchase their clothing directly from what are usually their buyers, trade to customers and the vintage explosion was great,

but then those one-of-a-kinds become rarer and rarer to find” (W. Gover, personal communication, September 18th, 2014).

Acceptability of second-hand shopping and resale outlets has been growing in the U.S.

According to the National Association of Resale and Thrift Shops, improved selections and better quality merchandise has contributed to 7% annual increase in resale, thrift and consignment stores (2013). As previously stated, the exact amount of textiles flowing through the varied resale outlets is unknown, but what is clear is that items that cannot be sold this way typically then re-enter the textile recycling system, getting picked over once again by the non-profit sorters. Through every channel of resale and sorting, higher quality goods are culled out, leaving the lower quality goods for exports and conversion to wiper rags and recycled fibers including shoddy.

A link between the rise of fast fashion with its disposable clothing model and the increase in textiles in landfills is one that was touched on in the literature review of this research and was a confirmed theme that also emerged throughout data analysis. On the subject of fast fashion Sass Brown, independent researcher of textile waste, had this to say:

“It’s disposable clothing with a deliberately limited timeline. It’s (made that way) to make it accessible (to buy). The bad side of accessibility is it has to have a more limited life cycle because you’re doing cheaper manufacturing, cheaper materials” (S. Brown, personal communication, September 19th, 2014).

These lower grade garments and materials have an impact on the overall textile recycling system. Speaking to the volume of textile waste, Jessica Schreiber, the Recycling Initiative Supervisor for New York City’s Department of Sanitation pointed to the need for even more resale outlets to resell these goods stating:

“I think that is the challenge. I mean 200,000 tons (of textile waste) just in New York City. That’s a crazy amount of clothing, even if we’re reselling half of that, that leaves another 100,000 tons that could be going all to recycling” (J. Schreiber, personal communication, July 8, 2014).

Even though there is a major statewide push to divert textiles from landfills and recover them for reuse and recycling, a rise in lower quality clothing that is not suitable or desirable for reuse means that if these materials enter the textile recycling system, they must be processed for recycling and fiber conversion if they are going to be diverted from landfills.

Based on these connections in the key informant interview data, three things can be inferred: (1) the rise of fast fashion has flooded the resale market with an abundance of lower quality, lower value goods, (2) an increase in second hand clothing outlets—both in terms of brick-and-mortar locations and internet sales—has increased domestic competition for higher quality goods and (3) even with an increase in second-hand outlets, due to the volume of textile waste entering the system, there is still a growing need for sales, fiber conversion or other creative outlets and uses for lower quality clothing and textile waste.

Collection Bins Controversy and Confusion

Another issue that was frequently raised and in need of reporting was the controversy surrounding clothing collection bins and their regulation, or in fact, lack there of. An increase in collection bins has led some localities to create ordinances or bans as a way to protect their communities from their proliferation (Secondary Materials and Recycled Textiles, 2014). The controversy begins with the fact that legally, anyone can purchase a clothing collection bin for around \$1,600 and place it out for donation solicitation so long as it has permission from of the

property owner. On its website, the Secondary Materials and Recycled Textiles has created a document to help local governments understand the importance of collection bins, while finding ways to manage or regulate them within specific communities.

Throughout this research, the proliferation of collection bins were noted for concerns including public safety, unsightliness and business transparency, as well as praised for their convenience, efficiency, and eco-friendliness for both consumers and businesses. Regarding public safety, collection bins are being closely examined by municipal building and fire code divisions in New York State in an effort to protect the public from potential hazards. Because these bins are not thoroughly regulated and are left freestanding and unattended, they pose a threat to public safety if a hazardous or flammable liquid or material is dumped along with a donation. Figure 4.9 shows a collection bin situated right next to propane fuel tanks. The bin shown in the photo also displays a caution sign warning that the bin is a falling hazard and should not be played in or around it. Unlike most, this bin is actually clearly marked to indicate the potential hazards it poses.

Figure 4.9 Clothing Collection Bin Hazards



Photo Source: Autumn S. Newell

The bins shown in Figure 4.10 are examples of the unsightliness that can occur when a bin is full or donators leave items other than clothing in or around a bin. Also, the bin shown on the left of this figure is an example of the illegally placed bins springing up around New York City on public sidewalks, with little information about who the collectors are, what charities, if any, they are contributing to. Illegally placed bins also cost municipalities manpower and money to remove.

As highlighted in the literature review portion of this study, convenience is a factor for consumers when donating unwanted clothing and household textiles and collection bins are one of the most convenient and effective ways to gather donations. However, the increasing number of collection bins springing up on public and private property means that donations that may be intended for charity can actually end up in the hands of many private collectors and businesses.

Figure 4.10 Unsightly and Illegally Placed Collection Bins



Photo Source: Autumn S. Newell

Some collection bins are marked for traditional, well-known charities such as the Salvation Army or Goodwill but many others are not as well known and may have missions less familiar to

the public. Speaking from the perspective of a municipality Bethlehem, New York Town Recycling Coordinator Dan Rain offered this statement:

“Some of the other obstacles have to do with the battle of the bin’s type of organization or companies. Often the companies are competing for the same kinds of locations. It’s all related to the bin location and proliferation issue”. (D. Rain, personal communication, June 20th, 2014)

As indicated in this quote, a frequent occurrence is for bins from multiple collectors to appear in one location right next to each other, as is the case seen in Figure 4.11. Shown in this photograph are bins from different collectors with very different missions, posing the challenge to donators to inform themselves of the missions of these collectors ahead of time or to make a blind choice before dropping off their unwanted items. The collector shown on the left of Figure 4.11, USAgain, is a for-profit textile collector whose mission is to divert excess clothing from landfills. Their website (<http://www.usagain.com/about-us>), states: “Our mission at USAgain is simple: to provide consumers with a convenient and eco-friendly option to rid themselves of excess clothing, which we divert from wasting in landfills for resale here in the U.S. and abroad.” All of the donations are sorted and sold in bulk and USAgain does not operate any of its own resale stores. The company is privately owned and makes no claims to being a charity but does claim to give charitable contributions through their Corporate Giving Program.

On the right of Figure 4.11, the Rescue Mission is a registered non-profit 501(C)(3), which operates thrift stores in seven counties in around New York State, which support services for homeless and hungry populations in the communities where they operate. Without prior knowledge of these two organizations, it can be difficult for donators to make informed decisions about what their donations are supporting and how they are being used. Donation confusion and

convenience are both important issues associated with collection bins which mainly pose challenges to established charitable donation centers that once commanded most of the donations, but must now share the donations with a growing number of new entrants to the market.

Figure 4.11 Clothing Donation Bins Confusion



Photo Source: Autumn S. Newell

Interestingly, the two types of organizations, seen Figure 4.11, represent the two types of materials that are bought and sold on the textile commodity market by large, for profit sorters by the truckload. On the left, USAgain which can be classified for this research as a large-for profit sorting business, collects and sells its own Credential loads which are more valuable because they have not undergone a first sort. On the right, the Rescue Mission which operates two types of stores, the Thrifty Shopper and 3Fifteen, sorts through all of its donations to retain any desirables for its retail shops. Any remaining goods are then sold off as Institutional loads, to for-profit sorters but are not as valuable since they have been sorted through once already.

Some donators have opinions about donations and therefore this was one of the issues addressed in the 5-point Likert-type statements included in the consumer survey. From the statements related to clothing donation bins and confusion about donations, Figures 4.12-14 show the results of the most significant opinions drawn from the consumer survey. The survey results indicate that consumers do indeed prefer to donate their unwanted textiles to charity organizations with 33% in strong agreement and 47% in agreement with statement S7: “I prefer to donate my unwanted clothing to non-profit charity organizations because it contribute to good causes” shown in Figure 4.12. Further, Figure 4.13 shows that consumers do have a good understanding that not all bins are operated by the charity organizations that they prefer to support, with 20% in strong agreement and 47% in agreement with statement S12: “I understand that not all clothing and textile donation bins are operated by non-profit charities and that some are operated by private for-profit businesses”.

Figure 4.12 Responses to Statement #7

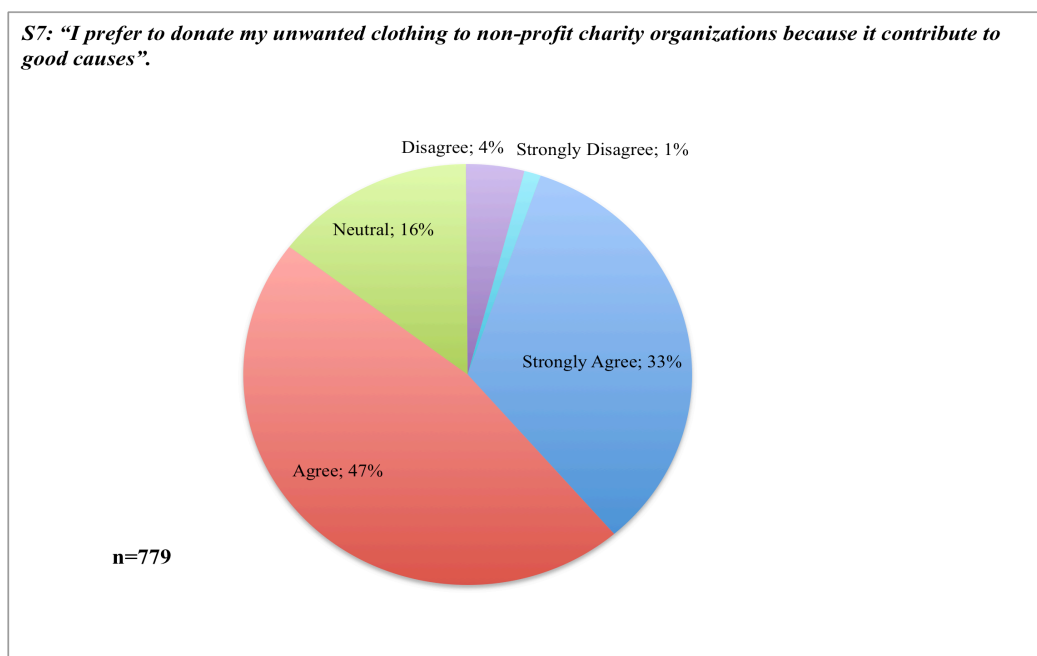


Figure 4.13 Responses to Survey Statement #12

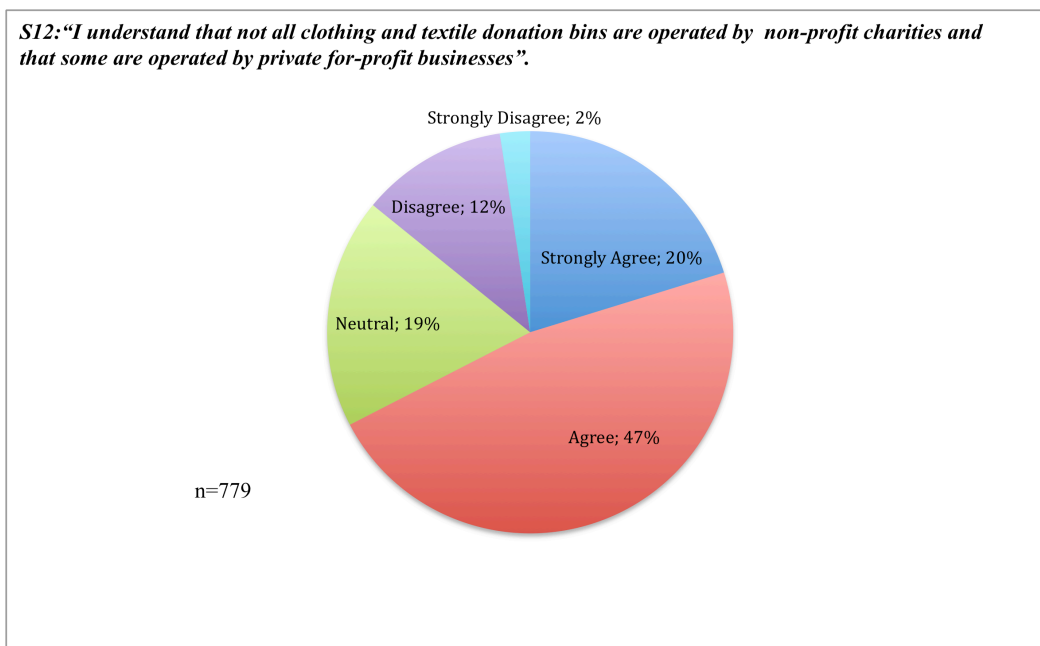
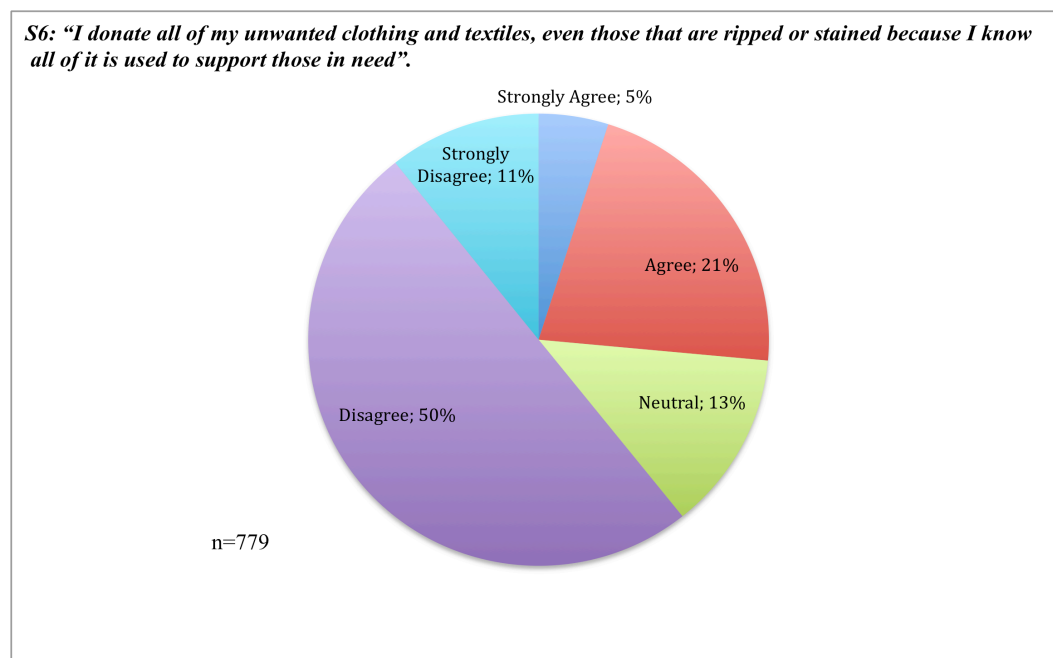


Figure 4.14 Responses to Survey Statement #6



However, confusion around donations is indicated in the Figure 4.14 around what is acceptable condition for textile donation. Respondents to the statement S6: “I donate all of my unwanted clothing and textiles, even those that are ripped or stained because I know all of it is used to support those in need” showed 50% disagreement and 11% strong disagreement with this statement. A major goal of the New York State-wide textile recovery campaign, ReClothe NY, is to clear up confusion around donations and educate consumers about items that are acceptable and can be processed for reuse or recycling with the textile recycling system.

Based on the results to this statement it can be inferred that this is another major inefficiency in the recovery of damaged clothing and that many consumers may be discarding textiles that they deem unsuitable for reuse or recycling and innocently contributing to the large amount of textiles being sent to the landfill each year. Consumer confusion about what is considered an acceptable donation for reuse and recycling could be part of the answer to the larger, original research question of why so much of U.S. textile waste disposed of into landfills?

Chapter 5

Conclusion

Limitations to Study

Limitations to this research must be acknowledged in order to provide full context for the results and conclusions. First, answers to the research questions and findings could be considered limited in their scope because this study was conducted by one primary investigator. Although the qualitative data was coded by a second-coder interpretations of the data were developed solely by the author. Second, much of the data collected from the consumer survey could be skewed due to the snowball-effect data collection method used that reached out within the network of the author to obtain 70% of the sample. Further, the timing of this case study unintentionally coincided with the development and launch of New York State's textile recovery campaign, ReClothe NY, which although very timely, did have an impact on the overall study. However, because New York is one of the most populated states and home to one of the four major fashion capitals of the world, it was already a unique state for this study. Expounding on that, the fact that New York has emerged as leader among states on addressing the issue of textile waste, only strengthens it as a selection for case study in this research area.

Implications and Conclusions

The purpose of this study was to provide a deeper understanding of the textile recycling system with the intention of also highlighting efficiencies and inefficiencies within the system. This study's findings outlined many of the strengths and weakness of the textile recycling system in New York State, which are also reflective of national and global challenges in dealing with

increasing amounts of textile waste. Inefficiencies in both input and output of the textile recycling system were identified in this study.

Three main inefficiencies found were which inhibit input into the textile recycling system are: (1) a significant lack in consumer's understanding of the acceptable condition of textiles that can be processed for reuse and recycling; (2) insufficient participation from the fashion industry in addressing textile waste (3) barriers to entry of smaller amounts pre-consumer textile waste into the system. Each of these inefficiencies limits textile recovery for reuse and/or recycling and can be considered contributing factors to the proliferation of textiles in landfills. Inefficiencies to input (1) and (2) can be directly addressed by increasing consumer outreach and education about recycling textiles. This type of consumer education is already a growing trend amongst many municipalities in New York State as well as among some fashion brands, but there is a strong need for increased participation from both mentioned parties to make significant strides in outreach. It is important for consumers to understand that items that are worn, torn, ripped and stained are still acceptable materials that can be processed by the textile recycling system so that less of these materials are discarded into landfills. Municipal waste and recycling managers can do more to include information about textiles in their recycling outreach efforts and can partner with established non-profit or for-profit collection and sorting business to process textile waste.

Moreover, a sentiment that was greatly emphasized by the key informants of this study was the importance of expanding participation from the fashion industry on all issues of textile waste because the industry is a significant generator of both pre and post-consumer textile waste. There are a number of ways that the fashion industry can do this beginning with taking steps to reforming the model of fast fashion, which although makes many fashions accessible to a wide population, can be highly unsustainable in terms of its waste generation. The increase in the

consumption and disposal of fast fashion and poorly made disposable clothing is a significant contributing factor to the high volume of textile waste entering landfills.

Inefficiency (3) indicates that within the textile recycling system improvements need to be made in order to process additional small loads of pre-consumer textile waste, generated by designers, manufacturers, sample makers and academic institutions. Although a robust, reverse supply chain exists for processing textile waste, it is only the end of the supply chain—the fiber converters—that have the capability to thoroughly process unusable scraps generated during the clothing design and production. Although most garment manufacturing occurs overseas, there is a desire from within the fashion industry and educational institutions that teach design to have an outlet for their waste. By making it easier to process pre-consumer waste, the textile recycling industry has the opportunity to build on recovery and diversion efforts while engaging the fashion industry in its mission.

There is a growing trend for fashion companies to take steps towards sustainability and ethical production, but the industry as a whole has a long road ahead in terms of being accountable for its overall environmental and human impact. Retail take-back programs are good step in the direction of accountability and voluntary producer responsibility for the waste that the fashion industry produces. At the point of sale, the fashion industry also has a direct line of communication with consumers and therefore has the potential to both educate consumers on how to recycle textiles and to incentivize textile recycling through take-back programs. When fashion brands are forced to find ways to handle and process the waste that they produce through the sale and consumption of their products, it can also have a significant impact on how and what is designed and sold.

This study also confirmed that within the current textile recycling system, materials recovered for reuse or recycling are processed very efficiently, recovering economic value and diverting 95% of the materials processed from landfills. However, although the current system can be deemed very efficient, this study also highlights concerns for potential inefficiencies in output from the system should be addressed in order to successfully increase and expand textile recovery and landfill diversion. Stakeholders must continue to find ways to process more waste if textile recovery initiatives continue to grow and be successful.

Although this study was unable to quantify how much additional material the system could continue to process efficiently before new forms of output are needed, inefficiencies in output do pose threats to the textile recycling system as markets become saturated with materials. New resale markets for second-hand clothing and converted fibers will have to be developed in order to handle an increase in materials flow to the system and process it for efficient output. While expanding export markets is certainly an option, developing additional ways to recycle and transform textile waste, as well as new applications for these materials should continue to be explored that can grow the concept of “waste equals food” introduced by McDonough and Braungart in 2002. If the development of new outlets and applications for textile waste cannot be developed and an increase in flow of textile waste must be dealt with through disposal, waste-to-energy incineration should be selected as a first choice for final disposal because of its ability to recover energy and because of the highly combustible nature of textiles.

Due to the economic value that that recovered textile waste can possess, it can be also be concluded that increasing input into textile recycling system and coupled with effective output can result in both reduced environmental impact and the growth of green jobs in New York State and other places. However, as Ekström and Salomonson (2014) point out, while reuse and

recycling are certainly part of the puzzle for reducing waste in landfills, larger issues around increasing consumption need to be considered in order to truly address waste. Moving towards responsible consumption models by consumers and sustainable production in the fashion industry, as well as throughout other aspects of society, can be taken on in order to reduce waste. Slowing growth, production and consumption can be considered as environmental solutions for reducing waste, however these approaches pose economic challenges that can have much greater implications for local and global economies that must be taken into account when considering them as recommended courses for action. However, fashion companies can reassess their position on these issues and reconsider how much growth is truly necessary to maintain financial sustainability and contribute to environmental sustainability efforts throughout their industry and greater aspects of society. Further, consumers can educate and empower themselves through both learning about and participating in textile recycling initiatives and by making purchasing choices that demonstrate responsible consumption. A willingness to purchase second-hand clothing actually combines these concepts and is a behavior that hopefully more consumers will continue consider over time. In the words of legendary fashion designer Vivian Westwood, “buy less, choose well and make it last”.

Future Research

For future studies on textile waste in several areas are recommended. First, more research is needed in areas of recycling and converting textile waste back into fibers and other materials. Research and development of new viable, products and industrial applications for materials made from converted textile waste could provide important solutions for dealing with textile quantity of waste. Innovations in these areas could also provide opportunities for low-grade textile waste

to be processed on more localized levels by fashion brands, entrepreneurs or organizations.

Future studies are needed in areas that cultivate sustainable models of consumption, design, and production and that help to reform many of the wasteful components of fast fashion. With retail take-back programs growing, further research on the effects of these initiatives for both consumers and brands could offer insights into managing these programs in the future.

Additional research could be conducted that compares the textile recycling industry to other recycling industries for a better understanding of consumer behaviors, improving recovery and navigating regulation issues.

Appendices:

Appendix A

Unstructured Interview Questions

1. What is your involvement with the issue of apparel and textile waste?
2. What do you think are the key issues concerning textile waste—generation and recovery?
3. What do you think is the best way to reduce and/or handle apparel and textile waste?
4. What do you think are the greatest obstacles that exist for reducing and/or collecting apparel and textile waste?
5. What opportunities do you see that being overlooked in reducing and/or collecting apparel and textile waste?
6. What do you see in the future for handling, managing or reducing textile and apparel waste?
7. Do you think that the disposal and/or collection of textile waste should be regulated by government?
8. Can you share your thoughts and opinions on the current apparel consumption and disposal habits of consumers?
9. What are the costs, financial or otherwise associated with collecting textile waste and diverting it from landfills that you know?
10. Do you support collaborative efforts between stakeholders to increase the recovery of textile waste?
11. How do you think the public can be better educated on this issue to reduce landfill disposal of apparel and textile waste?
12. How can New York State's leadership in this area be a model for other states?
13. If there was one thing that you wanted the public to know about textile waste and recycling, what would it be?
14. If there was one thing you could find out from public consumers regarding textile and waste and recycling, what would it be?

Appendix B

Consumer Apparel and Textile Disposal Survey

This survey is being conducted to gain a better understanding of consumer behaviors, habits and knowledge around the disposal of Textiles.

In this survey:

CLOTHING refers to all clothing, shoes and accessories.

HOME TEXTILES refers to towels, sheets, linens, curtains, rugs, etc.

TEXTILES refer to both Clothing and Home Textiles together, as they are classified as in the municipal solid waste system.

This survey should take approximately 5-10 minutes and your participation is greatly appreciated.

Q1 How do you dispose of Clothing that you no longer want? (Please select all that apply)

- Donate to charity (i.e. Goodwill, Salvation Army, Other non-profit organization)
- Resell items (i.e.: eBay, consignment, buy-sell-trade stores)
- Give away to friends and/or family
- Clothing Swaps
- Up-cycle into other items
- Drop off at donation bins
- Dispose of into trash
- Cut-Up and Use for Rags
- Other _____

Q2 How often do you get rid of unwanted Clothing?

- Once a Week
- Once a Month
- 2-3 Times a Year
- Once a year
- Every few years

Q3 How do you dispose of Household Textile? (Please select all that apply)

- Donate to charity (i.e. Goodwill, Salvation Army, Other non-profit organization)
- Resell items (i.e.: eBay, consignment, buy-sell-trade stores)
- Give away to friends and/or family
- Drop off at donation bins
- Up-cycle into other items
- Dispose of into Trash
- Cut-Up and Use for Rags
- Other _____

Q4 How often do you discard unwanted Household Textiles?

- Once a week
- Once a month
- 2-3 Times per year
- Once a year
- Every few years

Q7 Please select your FIRST choice for disposing of your unwanted Textiles (Clothing and Household textiles).

- Donate to charity locations (i.e. Goodwill, Salvation Army, Other non-profit organization)
- Resell items (i.e.: eBay, consignment, buy-sell-trade stores)
- Drop off at donation bins
- Give away to friends and/or family
- Clothing Swaps
- Up-cycle into other items
- Dispose of into Trash
- Cut-Up and Use for Rags
- Other _____

Q6 Please select the number one reason why you decide to get rid of unwanted clothing?

- Items are worn out or damaged
- Items are stained
- Items are no longer in style
- Items don't fit
- Need to make space to acquire more clothing

Q7 Do you ever dispose of unwanted Textiles (Clothing and Household Textiles) in the trash?

- Yes
- Sometimes
- No

If No is selected, then skip to: Do you recycle other products like pa...

Q8 Please select the reasons why you dispose of unwanted textile items into the trash.

- Items are worn out, stained or damaged
- It is convenient
- I don't know what else to do with them

Q9 Do you recycle other products like paper, glass, metal, etc?

- Yes
- No

Q10 Where do you practice recycling in your life? (Please select all that apply)

- Home
- Work
- School
- Other _____

Q11 Please select your age group:

- Under 18
- 18-25
- 26-40
- 41-55
- 56-70
- Over 70

Q12 Please Select:

- Male
- Female

Q13 Do you live in New York State?

- Yes
- No

Q14 If you DO NOT live in New York State, please name the State where you live.

*The following statements refer to how people dispose of Clothing and Household Textiles.
Please read each statement and indicate the degree to which you agree or disagree.*

S1 Donating clothing and other textiles for reuse and recycling is inconvenient and time consuming.

- Strongly Agree (1)
- Agree (2)
- Neither Agree nor Disagree (3)
- Disagree (4)
- Strongly Disagree (5)

S2 I prefer to drop my unwanted clothing and textiles at collection bins because it is convenient.

- Strongly Agree (1)
- Agree (2)
- Neither Agree nor Disagree (3)
- Disagree (4)
- Strongly Disagree (5)

S3 If I want to get rid of old clothing, my first choice is to re-sell items for money.

- Strongly Agree (1)
- Agree (2)
- Neither Agree nor Disagree (3)
- Disagree (4)
- Strongly Disagree (5)

S4 I prefer to donate my unwanted clothing to non-profit charity organizations because it contributes to good causes.

- Strongly Agree (1)
- Agree (2)
- Neither Agree nor Disagree (3)
- Disagree (4)
- Strongly Disagree (5)

S5 I am happy to donate my clothing to for-profit business because I just want my unwanted textiles to reused or recycled.

- Strongly Agree (1)
- Agree (2)
- Neither Agree nor Disagree (3)
- Disagree (4)
- Strongly Disagree (5)

S6 I donate all of my unwanted clothing and textiles, even those that are ripped or stained because I know they will be reused or recycled in some way.

- Strongly Agree (1)
- Agree (2)
- Neither Agree nor Disagree (3)
- Disagree (4)
- Strongly Disagree (5)

S7 I prefer to donate my old clothing to a charity because I know all of it is used to support those in need.

- Strongly Agree (1)
- Agree (2)
- Neither Agree nor Disagree (3)
- Disagree (4)
- Strongly Disagree (5)

S8 I would recycle my unwanted clothing and textiles curbside with other recyclables if municipalities collected it.

- Strongly Agree (1)
- Agree (2)
- Neither Agree nor Disagree (3)
- Disagree (4)
- Strongly Disagree (5)

S9 I throw my unwanted clothing into the trash because I don't know what else to do with it.

- Strongly Agree (1)
- Agree (2)
- Neither Agree nor Disagree (3)
- Disagree (4)
- Strongly Disagree (5)

S10 I repair and alter my clothing to extend its lifecycle.

- Strongly Agree (1)
- Agree (2)
- Neither Agree nor Disagree (3)
- Disagree (4)
- Strongly Disagree (5)

S11 *I turn old clothing and other textiles into rags for household use.*

- Strongly Agree (1)
- Agree (2)
- Neither Agree nor Disagree (3)
- Disagree (4)
- Strongly Disagree (5)

These following statements refer to the your understanding of what happens to clothing and household textiles once they enter the textile recycling system. Please read each statement and indicate the degree to which you agree or disagree.

S12 *I understand that not all clothing and textile donation bins are operated by non-profit charities and that some are operated by private, for-profit businesses.*

- Strongly Agree (1)
- Agree (2)
- Neither Agree nor Disagree (3)
- Disagree (4)
- Strongly Disagree (5)

S13 *When clothing has a stain or rip, I throw it in the trash because no organization will want it.*

- Strongly Agree (1)
- Agree (2)
- Neither Agree nor Disagree (3)
- Disagree (4)
- Strongly Disagree (5)

S15 *I am aware that clothing and textile waste is increasing in landfills and could be otherwise be recycled.*

- Strongly Agree (1)
- Agree (2)
- Neither Agree nor Disagree (3)
- Disagree (4)
- Strongly Disagree (5)

S16 *I am aware that much of the second hand clothing that is donated is exported to foreign countries.*

- Strongly Agree (1)
- Agree (2)
- Neither Agree nor Disagree (3)
- Disagree (4)
- Strongly Disagree (5)

S17 *I am not aware of how clothing can be recycled.*

- Strongly Agree (1)
- Agree (2)
- Neither Agree nor Disagree (3)
- Disagree (4)
- Strongly Disagree (5)

THANK YOU!!

Appendix C

Codebook Used for Key Informant Interview on Textile Waste

1. Clothing Quality

Families (1): Donations

Quotations: 13

Definition: Quality of clothing entering the textile recycling system and solid waste systems.

2. Collection Bins

Families (1): System Efficiency

Quotations: 12

Definition: Drop box style donation/collection bins used by both non- profit and for-profit businesses to gather donations.

3. Consumer Education/Awareness/Power

Families (1): System Efficiency

Quotations: 44

Definition: Public awareness of textile recycling and disposal and their power to affect change through purchasing and behavior choices.

4. Consumption

Families (1): System Efficiency

Quotations: 13

Definition: Issues around clothing and apparel consumption.

5. Contamination

Families (1): Donations

Quotations: 8

Definition: Contamination of textiles with moisture, mold, mildew or other that make the materials unsuitable for reuse or recycling.

6. Convenience

Families (1): Donations

Quotations: 7

Definition: Convenience of recycling and donation locations for consumers.

7. Economic Value

Families (1): Regional Impact

Quotations: 20

Definition: Economic and monetary value that textiles provide business, charities and communities when recovered for reuse and recycling.

8. Environmental Impact

Families (1): Regional Impact

Quotations: 5

Definition: The impact of textile waste on the natural environment.

9. Exports

Families (1): Textile Recycling System

Quotations: 16

Definition: Issues involved with the exports of U.S. second-hand clothing.

10. Fashion Industry

Families (1): System Efficiency

Quotations: 32

Definition: Participation and involvement by the fashion industry (Designers, Retailers, Manufacturers, etc) in clothing and textile recycling initiatives and end of life considerations.

11. Fast Fashion & Disposable Clothing

Families (1): Donations

Quotations: 14

Definition: Clothing designed for short life-spans and disposability with little opportunity for reuse.

12. Fiber Conversion/Down-cycling

Families (1): Textile Recycling System

Quotations: 15

Definition: Transforming clothing and textile waste into other lower-grader fibers for reuse.

13. For-Profit Sorters/Collection Businesses

Families (1): Textile Recycling System

Quotations: 7

Definition: Privately owned clothing and textile collection and sorting business.

14. Handling/Collection Costs

Families (1): System Efficiency

Quotations: 13

Definition: Financial costs associated with collection and handling of textile waste

15. Municipal/Government Involvement

Families (1): System Efficiency

Quotations: 13

Definition: The involvement of local municipal waste management or state and federal government on the issue of textile waste.

16. New York State

Families (1): Regional Impact

Quotations: 10

Definition: References to local or regional areas of New York State.

17. Non-Profits/Charities Sorting/Collection/Resale Business

Families (1): Textile Recycling System

Quotations: 19

Definition: Not-for profit clothing and textile collection, sorting and resale charities and organizations with a social mission.

18. Recycling

Families (1): Textile Recycling System

Quotations: 25

Definition: The action of turning in items for reuse and conversion to other products.

19. Refashioning/Up-Cycling

Families (1): System Efficiency

Quotations: 7

Definition: Repurposing textile waste to give it an added value and an extended lifecycle.

20. Resale Industry

Families (1): Textile Recycling System

Quotations: 12

Definition: The resale sector of retail including sales on the internet, thrift, consignment and buy-sell-trade stores.

21. Retail Take-Back Programs

Families (1): System Efficiency

Quotations: 9

Definition: Programs set-up by retailers to recover clothing for reuse, resale and recycling.

22. Reuse

Families (1): Textile Recycling System

Quotations: 6

Definition: Reusing items in their original form to extend their lifecycle.

23. Textile Recovery/Landfill Diversion

Families (1): Textile Recycling System

Quotations: 10

Definition: The recovery of clothing and textiles for reuse and recycling that diverts them from incineration or landfills.

24. Textile Recycling System

Families (1): Textile Recycling System

Quotations: 13

Definition: The reverse supply chain of stakeholders in place to process recycled textiles.

25. Textiles in the Waste Stream/Landfill

Families (1): Regional Impact

Quotations: 14

Definition: Textiles other than clothing in the waste stream destined for the landfill, including industrial and commercial operations, carpets, etc.

26. Volume of Clothing/Textile Waste

Families (1): Regional Impact

Quotations: 15

Definition: Sheer volume of textile waste in the world.

27. Wiper Rags

Families (1): Textile Recycling System

Quotations: 11

Definition: Low-grade clothing donations which are cut-up to become rags for commercial and industrial wiping needs.

Appendix D

Key Informant Interview Quotations

Textile Waste Research

All current quotations (323 quotes)

P 1: Informant #1.docx - 1:1

Codes:[Clothing Quality - Family: Donations]

“They go through a process here by which what is deemed suitable for sale in the store goes back out to the stores, and then what's deemed for sale at our concept shop by the bag goes there.”

P 1: Informant #1.docx - 1:2

Codes:[Economic Value - Family: Regional Impact]

“Then what's deemed as not sellable for a number of reasons is bailed or sold in [inaudible 01:56] to a couple of rag brokers out there by the pound. With the money that comes back from that, all the money goes back to our thrifts, and then that and then the money that we get from what we call salvage, which is the brokers, goes back to Housing Works Bank where our mission is to provide.”

P 1: Informant #1.docx - 1:4

Codes:[Collection Bins - Family: System Efficiency] [Convenience - Family: Donations]

“With these illegal bins that I'm sure you're familiar with that has plagued the city for quite a while and is costing the city a huge amount of money to address, the people who are putting stuff in those bins are doing it out of convenience.”

P 1: Informant #1.docx - 1:7

Codes:[Collection Bins - Family: System Efficiency] [Convenience - Family: Donations]

“People talk about the Salvation Army too. The admin costs are high. I don't know that that's true, but they're doing some kind of good, so if that's convenient to you, bring it to their store, anything but a tank bin.”

P 1: Informant #1.docx - 1:8

Codes:[Fiber Conversion/Downcycling - Family: Textile Recycling System]

“All I know is that some of it goes to the end user intact and some of it, the end user breaks down for carpets and cars and stuff like that.”

P 1: Informant #1.docx - 1:9

Codes:[Exports - Family: Textile Recycling System]

“I don't know because the people in the third world countries who are the end users for some of this stuff, I don't know what they're paying for it. I don't know what that process is like. I don't know what the legality is. Would I like to see it intact and recycled and reused entirely? Yeah, that would seem to be logically the best use.”

P 1: Informant #1.docx - 1:10**Codes:[Volume of Clothing/Textile Waste - Family: Regional Impact]**

“We've always been flooded with donations. It's something that we've learned to live with.”

P 1: Informant #1.docx - 1:11**Codes:[Contamination - Family: Donations]**

“I'm trying to figure something out, but I think the biggest obstacle from my point of view, or the biggest risk I should say, which hasn't become an obstacle yet, but could be, is contamination. That's a huge concern for us.”

P 1: Informant #1.docx - 1:12**Codes:[Contamination - Family: Donations]**

“With these public bins out there in the street, that's what they're becoming. The thing people have to understand in this business is that sometimes textiles, and it depends on the way that they're treated because certainly some of it is recyclable and some of it's just waste, and that's all there is to it. You can't really put contaminated waste into anything. You can't recycle it. There's no way.”

P 1: Informant #1.docx - 1:13**Codes:[Refashioning/Up-Cycling - Family: System Efficiency]**

“Re-purposing, is that what you mean? We've explored that and it's so Etsy, so polished girl in her dorm room, not that there's anything wrong with that, but it's just too small for us production-wise and market-wise.”

P 1: Informant #1.docx - 1:14**Codes:[Economic Value - Family: Regional Impact]**

“On the end, what we're going to see is a huge decrease in what these brokers are willing to pay by the pound because this is now a multi-billion industry overnight pretty much. Everybody wants a piece of this action. It's easy.”

P 1: Informant #1.docx - 1:15 Codes: [Consumption - Family: System Efficiency] [Fast Fashion & Disposable Clothing - Family: Donations]

“As long as the H&Ms of the world keep coming up, then we're just going to have more and more disposable clothing and Forever 21, and I'm not putting them down, but that type of retail industry is not going away and in fact, it's getting huge. There's never going to be a shortage of this stuff ever.”

P 1: Informant #1.docx - 1:16**Codes:[Clothing Quality - Family: Donations]**

“As far as how to deal with it, sure we'll be growing hopefully a few more stores in the next few years, but I honestly with this disposable stuff, I don't know what's going to happen because we can't sell H&M, maybe if it has a tag on it, but it's not worth our time.”

P 1: Informant #1.docx - 1:17**Codes:[For-Profit Sorters/Collection Businesses - Family: Textile Recycling System]**

“I think the rag brokers are going to get richer and we'll just see a big giant spike in that industry.”

Whether or not that's like I said a good or bad thing, actually I should say should really be, if that is the case and that's true, then the industry needs to be more transparent to everyone.”

P 1: Informant #1.docx - 1:18 Codes:

Codes:[Clothing Quality - Family: Donations]

“Absolutely. Quality in terms of value, yes. Condition remains the same. Rag is rag, and for that, blame the internet.”

P 1: Informant #1.docx - 1:19

Codes:[Resale Industry - Family: Textile Recycling System]

“You can sell that sweater yourself without [inaudible 14:51] right now in ten minutes with the click of a button. The proliferation of second hand stores that purchase their clothing directly from what are usually their buyers, trade to customers, and the vintage explosion was great, but then those one of a kinds became rarer and rare to find, thanking Sarah Jessica Parker for that.”

P 1: Informant #1.docx - 1:20

Codes:[Resale Industry - Family: Textile Recycling System]

“You start collecting them, keeping them, and selling it themselves. That and a few other components have certainly had an effect on the value of the goods that we receive over the years, no doubt about it.”

P 1: Informant #1.docx - 1:21

Codes:[Fast Fashion & Disposable Clothing - Family: Donations]

“The sweaters are still \$9.95 and they've been able to do this just by increasing their locations. I don't know how many there are in New York right now.”

P 1: Informant #1.docx - 1:22

Codes:[Fast Fashion & Disposable Clothing - Family: Donations]

“There's no six weeks waiting time between the trend and it getting sent to Forever 21. It's that disposable industry is just incredibly fast, much faster trend-wise than it used to be.”

P 1: Informant #1.docx - 1:23

Codes:[Recycling - Family: Textile Recycling System]

“I think any kind of recycling is important.”

P 1: Informant #1.docx - 1:25

Codes:[Handling/Collection Costs - Family: System Efficiency]

“I don't have a number for you, but the contract that we have with the City of New York for this refashion program, we have to pay for all that stuff. Those bins are \$700 each. We have three dedicated trucks five days a week, so that means six people on the trucks and everything that comes with that. We lease the trucks. We don't own them. There's the time and the labor and then once the stuff gets back here, again there's the labor of sorting it.”

P 1: Informant #1.docx - 1:26

Codes:[Clothing Quality - Family: Donations]

“I will say the good news though, and as much as all those costs are very high, is that the quality

of the goods that we get back from refashion, the assumption was that they would be lesser quality and they would go straight to rag when in fact we found out that's not the case.”

P 1: Informant #1.docx - 1:27

Codes:[Consumer Education/Awareness/Power - Family: System Efficiency]

“I think it's really just a matter of smart PR and marketing, really smart, new, innovative, something people haven't seen before right down to the graphic on the subway. I know this costs money, but there's a lot of power in just pictures of a landfill.”

P 1: Informant #1.docx - 1:28

Codes:[Consumer Education/Awareness/Power - Family: System Efficiency]

“Again, it's just thoughtful smart messaging. Aside from the internet, through all the other usual PSA channels.”

P 1: Informant #1.docx - 1:29

Codes:[Consumer Education/Awareness/Power - Family: System Efficiency]

“I think the key issues are education, awareness.”

P 2: Informant #10.docx - 2:1

Codes:[Volume of Clothing/Textile Waste - Family: Regional Impact]

“First of all, I think just the sheer amount of it, the fact that the bulk of it is not recycled.”

P 2: Informant #10.docx - 2:2

Codes:[Recycling - Family: Textile Recycling System]

“I think the separation and recycling of that is first and foremost paramount.”

P 2: Informant #10.docx - 2:3

Codes:[Fiber Conversion/Downcycling - Family: Textile Recycling System] [Wiper Rags - Family: Textile Recycling System]

“They may end up as seat stuffing in a car or as factory wipes, but at least they are being reutilized.”

P 2: Informant #10.docx - 2:4

Codes:[Consumer Education/Awareness/Power - Family: System Efficiency] [Recycling - Family: Textile Recycling System]

“I think that first and foremost, we have to either encourage and get a much higher participation level of recycling textiles. That may be on the consumer end, or it may be on the recycling end.”

P 2: Informant #10.docx - 2:5

Codes:[Textiles in the Waste stream/Landfill - Family: Regional Impact]

“There's absolutely no reason that percent of textiles should be ending up in a landfill.

P 2: Informant #10.docx - 2:6

Codes:[Environmental Impact - Family: Regional Impact]

“That's another issue with landfill. It's the land mass it requires. That's a problem in and of itself.”

P 2: Informant #10.docx - 2:8**Codes:[New York State - Family: Regional Impact]**

“I live in New York, and there are limited number of clothing drop-off spots.”

P 2: Informant #10.docx - 2:9**Codes:[Collection Bins - Family: System Efficiency]**

“I know there is been a big push and a big drive to now put clothing recycling bins in large apartments and businesses.”

P 2: Informant #10.docx - 2:10**Codes:[Contamination - Family: Donations] [New York State - Family: Regional Impact]**

“Also in a city like New York, that, I think, has been curtailed to the degree of the enormous fear people have about bedbugs because it's been such a massive problem in New York.”

P 2: Informant #10.docx - 2:11**Codes:[Fiber Conversion/Downcycling - Family: Textile Recycling System]**

“In terms of applications or acceptance of waste by industries, whether it's for seat stuffing or insulation in buildings or factory I'm not sure of the simplicity of that chain of logistics.”

P 2: Informant #10.docx - 2:12**Codes:[Fashion Industry - Family: System Efficiency] [Refashioning/Up-Cycling - Family: System Efficiency]**

“Absolutely, absolutely. I think there are massive opportunities. There's such a fabulous range of designers working with up-cycled materials, whether they're quality vintage garments that have been damaged or stained, or whether they're cheap crap that's just been completely reconfigured.”

P 2: Informant #10.docx - 2:15**Codes:[Consumption - Family: System Efficiency]**

“I guess a number of things would affect it positively if they were to happen. One would be a slowing of consumption.”

P 2: Informant #10.docx - 2:16**Codes:[Consumption - Family: System Efficiency] [Fashion Industry - Family: System Efficiency]**

“We'd obviously be making less waste, and it would hopefully be a reflection of higher quality consumption, so less but better quality, which would also speak to the ability to continue the life cycle of those textiles and those garments.”

P 2: Informant #10.docx - 2:17**Codes:[Recycling - Family: Textile Recycling System]**

“Another thing that would help would be recycling fiber plants and in something that's happened in recently as wool has always traditionally been recycled in places like Italy, but it hasn't been elsewhere in the world. Cotton never used to be recycled, but it is more and more commonly being recycled now. It can't be recycled to a new virgin fiber because you're shortening the

filament every time it's shredded.”

P 2: Informant #10.docx - 2:18

Codes: [Recycling - Family: Textile Recycling System]

“Fiber recycling plants would be another issue. It's a massive industry in Italy with wool.”

P 2: Informant #10.docx - 2:19

Codes: [Fast Fashion & Disposable Clothing - Family: Donations]

“It's disposable clothing with a deliberately limited timeline. It's (made that way) to make it accessible (to buy). The bad side of accessibility is it has to have a more limited life cycle because you're doing cheaper manufacturing, cheaper materials”

P 2: Informant #10.docx - 2:20

Codes: [Consumption - Family: System Efficiency]

“It doesn't have to affect an individual's budget significantly to buy less but buy better quality. You're not necessarily talking about spending more money unless you so choose to. You're just making more conscious, more considered purchases that will live longer in your wardrobe.”

P 2: Informant #10.docx - 2:22

Codes: [Fashion Industry - Family: System Efficiency]

“I think there's another really great opportunity, particularly for manufacturers and retailers that has not been explored honest at all, and that is them using their own waste.”

P 2: Informant #10.docx - 2:23

Codes: [Volume of Clothing/Textile Waste - Family: Regional Impact]

“By default, their waste has got to be massive, whether its unsold stock, damaged stock, leftover fabrications, wrong colors, whatever it is, their waste must be enormous.”

P 2: Informant #10.docx - 2:24

Codes: [Fashion Industry - Family: System Efficiency]

“Instead of bringing in a hot new designer to design the new hot collection that's at a reasonable mass market price point for your high street and have it sold out, why not take the hot new designer and get them to recycle your waste and do a hot new collection?”

P 2: Informant #10.docx - 2:25

Codes: [Economic Value - Family: Regional Impact]

“In fact, greater possible financial benefits for the manufacturer and retailer because they are not actually purchasing new fabrics. They're using their own.”

P 2: Informant #10.docx - 2:26

Codes: [Fashion Industry - Family: System Efficiency] [Refashioning/Up-Cycling - Family: System Efficiency]

“Alternatively to work with up-cycling designers in a similar model for their damaged clothing, again, the damages, the returns they must have when you're talking about a high street manufacturer or retailer, vertical manufacturer, whatever, must be incredible.”

P 2: Informant #10.docx - 2:28**Codes:[Retail Take-Back Programs - Family: System Efficiency]**

“You have all of these big stores or retailers such as H&M who do a take that program but then what, what do they do with? Why aren’t they taking it back and reutilizing it?”

P 2: Informant #10.docx - 2:29**Codes:[Fashion Industry - Family: System Efficiency] [Recycling - Family: Textile Recycling System]**

“The only store that I’ve seen do that was Marks and Spencer’s in the UK. They did it with ... Well they got their customers to drop of damaged old wool coats and they did a basic Pea Coat, a woolen navy Pea Coat they made out of all of the shredded and reconstituted fiber from the mall and they resold it through the stores.”

P 2: Informant #10.docx - 2:30**Codes:[Exports - Family: Textile Recycling System] [Fiber Conversion/Downcycling - Family: Textile Recycling System] [Retail Take-Back Programs - Family: System Efficiency]**

There’s a ton who take that programs but then what? Where do they go? They go into the normal stream of shipping off to other countries of down-cycling it of etcetera, etcetera.

P 2: Informant #10.docx - 2:38**Codes:[Refashioning/Up-Cycling - Family: System Efficiency]**

“The waste that each of our design students for example make through production of their projects, is an opportunity to up-cycle, recycle that waste but until there are places for it to go and things to do with it, it needs to be a closed loop not just a single part of the puzzle.”

P 2: Informant #10.docx - 2:39**Codes:[Collection Bins - Family: System Efficiency]**

“There are a lot of different things. I know a city wide push on recycling bins for textiles specifically.”

P 2: Informant #10.docx - 2:40**Codes:[Recycling - Family: Textile Recycling System]**

“I think that somewhere in the region of 95% or more textiles can be recycled, up-cycled, down-cycled in some way, shape, or form.”

P 2: Informant #10.docx - 2:41**Codes:[Fashion Industry - Family: System Efficiency]**

“There's no shortage of designers that are looking for free or cheap materials to start a business, to continue a business, to consolidate a business. There is no shortage of factories, manufacturers, retailers, and consumers throwing clothing away or fabric.”

P 2: Informant #10.docx - 2:42**Codes:[Retail Take-Back Programs - Family: System Efficiency]**

“I do think manufacturers should be responsible, whether it’s responsible for the take back of their product at the end of its life, whether it’s a cell phone, a food mixer or a piece of clothing.”

P 2: Informant #10.docx - 2:43**Codes:[Fashion Industry - Family: System Efficiency]**

“I think really from my part in terms of textile recycling there are just so many opportunities here that have not even began to be explored on any major level and it continuously confounds me why not.”

P 2: Informant #10.docx - 2:44**Codes:[Fashion Industry - Family: System Efficiency]**

“The waste mapping, the retailers remaking, reusing their own materials are manufacturers responsibility for material take back and no brainers and they’re simple.”

P 3: Informant #2.docx - 3:1**Codes:[Retail Take-Back Programs - Family: System Efficiency]**

“It's a take back program.”

P 3: Informant #2.docx - 3:3**Codes:[Volume of Clothing/Textile Waste - Family: Regional Impact]**

“We have a lot of clothes. In fact, what do you do with the clothes? You give some to your friends, but there's so many.”

P 3: Informant #2.docx - 3:4 Codes: [Non-Profits/Charities Sorting/Collection/Resale Business - Family: Textile Recycling System] [Retail Take-Back Programs - Family: System Efficiency]

“We started asking our employees if they would give us back their clothes so we could sell them to support this non-profit program.”

P 3: Informant #2.docx - 3:5**Codes:[Recycling - Family: Textile Recycling System] [Resale Industry - Family: Textile Recycling System]**

“When the idea of this recycle thing, she really embraced it. She said, "Yes, I'll have a section in my store.”

P 3: Informant #2.docx - 3:6**Codes:[Fashion Industry - Family: System Efficiency]**

“How do we start to design into longevity instead of ... Fashion is an art form, I get it.”

P 3: Informant #2.docx - 3:7**Codes:[Consumption - Family: System Efficiency]**

“Generation is just completely endemic to the consumer culture that we live in. The entire basis of American economy is on sell more stuff and the clothing industry is no exception.”

P 3: Informant #2.docx - 3:8**Codes:[Fast Fashion & Disposable Clothing - Family: Donations]**

“I think clothes are built with a kind of expiry date and unfortunately it's pretty short.”

P 3: Informant #2.docx - 3:10**Codes:[Fashion Industry - Family: System Efficiency]**

“We're trying to really institute that in how we run our department, in how we set up our, we have two recycle centers, our store, really start to walk the walk.”

P 3: Informant #2.docx - 3:11**Codes:[Consumer Education/Awareness/Power - Family: System Efficiency]**

“I think it's an education piece and as we start to talk about ... You know we talk about it as conscious consumerism.”

P 3: Informant #2.docx - 3:12**Codes:[Clothing Quality - Family: Donations]**

“They are high priced. They have an intrinsic value. People take really good care of these clothes. When people were giving them back, they were bringing ... They were sending them back and in some cases they would be wrapped in tissue paper. They took such loving care of this clothing.”

P 3: Informant #2.docx - 3:15**Codes:[Consumption - Family: System Efficiency]**

“How does that conscious consumerism hit the retail, in terms of art?”

P 3: Informant #2.docx - 3:17**Codes:[Volume of Clothing/Textile Waste - Family: Regional Impact]**

“We've had such an amazing response. In the time that we've been doing this, we've gotten over 200,000 units of clothing. That's a lot of clothes. Here's our problem, what do we do with all this stuff.”

P 3: Informant #2.docx - 3:18**Codes:[Handling/Collection Costs - Family: System Efficiency]**

“Storing the stuff, handling the stuff, sorting it. We have these categories of stuff that can be resold, stuff that's still good enough to wear but it's not quite good enough to sell so we donate that to women's places where women are in transition.”

P 3: Informant #2.docx - 3:19**Codes:[Refashioning/Up-Cycling - Family: System Efficiency]**

“Then, we have stuff that can't be sold. We have what we call a Third Life Program, where we up-cycle things into rugs and into baby sweaters and things like that.”

P 3: Informant #2.docx - 3:20**Codes:[Recycling - Family: Textile Recycling System]**

“We have recycle centers on the east and west coast.”

P 3: Informant #2.docx - 3:22**Codes:[Fiber Conversion/Downcycling - Family: Textile Recycling System]**

“We're working with different [Lensing 00:14:43] and Scandinavia, something, I think it's in Switzerland. We're looking into how you extract cellulose, then re-spin it.”

P 3: Informant #2.docx - 3:23**Codes: [Volume of Clothing/Textile Waste - Family: Regional Impact]**

“I feel the two challenges are, how do we get more product to customers and how do we deal with the waste.”

P 3: Informant #2.docx - 3:24**Codes: [Refashioning/Up-Cycling - Family: System Efficiency]**

“She does something called sweater chop where she takes sweaters and takes the sleeves. Basically, it's re-purposing the things. We're really looking into re-purposing the textiles, which still have a life in them, just not as they were originally intended.”

P 3: Informant #2.docx - 3:25**Codes: [Fashion Industry - Family: System Efficiency]**

“Outside of that, it's really working with our designers and other designers to think about how do we start to design into a process that makes the end piece still have some application somewhere.”

P 3: Informant #2.docx - 3:27**Codes: [Fiber Conversion/Downcycling - Family: Textile Recycling System]**

“They were taking recycled fabrics and they were chopping it up and putting it into car seats.”

P 3: Informant #2.docx - 3:28**Codes: [Exports - Family: Textile Recycling System]**

“Then they just bundle it and offload it to third world, which to me is no solution.”

P 3: Informant #2.docx - 3:29**Codes: [Exports - Family: Textile Recycling System] [Textiles in the Waste stream/Landfill - Family: Regional Impact]**

“To me, it was very telling that it doesn't even enter their conscious that putting it in a landfill in a third world country is not really the answer.”

P 3: Informant #2.docx - 3:30**Codes: [Exports - Family: Textile Recycling System]**

“Oh, those people need the clothes. Maybe they do, but what's happening to their local textile industry as a result of this, flooding the market with American leftovers, you know?”

P 3: Informant #2.docx - 3:31**Codes: [Consumer Education/Awareness/Power - Family: System Efficiency]**

“Here again, I really think it's about education for the consumer.”

P 3: Informant #2.docx - 3:32**Codes: [Fast Fashion & Disposable Clothing - Family: Donations]**

“If people stop buying that crap, you wash it twice and then it's over. Yes, you maybe look nice to go to your company picnic but it's individuals taking more responsibility.”

P 3: Informant #2.docx - 3:34

Codes:[Exports - Family: Textile Recycling System] [Textiles in the Waste stream/Landfill - Family: Regional Impact]

“What do the landfills look like in Haiti? What do they look like in Africa? Or wherever they're sending all this stuff.”

P 3: Informant #2.docx - 3:35

Codes:[Retail Take-Back Programs - Family: System Efficiency]

“It's not like, I guess it's H&M or somebody, that's taking back and off-loading them. I mean that is not a solution.”

P 3: Informant #2.docx - 3:37

Codes:[Consumer Education/Awareness/Power - Family: System Efficiency]

“I think it's consumer power. I think if consumers vote with their dollars that they support companies that are being responsible.”

P 3: Informant #2.docx - 3:39

Codes:[Consumption - Family: System Efficiency]

“In Europe, I just remember people only have a limited amount of garments. They don't have 47 sweaters. They have five, do you know what I mean? Because they're more valuable. They're more respected. There's something about that.”

P 3: Informant #2.docx - 3:40

Codes:[Retail Take-Back Programs - Family: System Efficiency]

“As we've expanded it, now we take back at every single Fisher store across the United States.”

P 3: Informant #2.docx - 3:43

Codes:[Handling/Collection Costs - Family: System Efficiency]

“We have some that does sewing repairs. If we can fix something in under 15 minutes, we do it, if it's a good quality piece. It's sorting. It's the things go to the dry cleaners, things that aren't dry cleaned but we're going to give to women's shelters and stuff. Those have to be washed so somebody has to wash them.”

P 3: Informant #2.docx - 3:44

Codes:[Handling/Collection Costs - Family: System Efficiency] [Volume of Clothing/Textile Waste - Family: Regional Impact]

“Storage has been a huge thing. The place in Seattle, the woman who manages it just called and said, "We're out of space again." This is after we had an outdoor pot. We rented a storage locker. It's stored up to the light fixtures. We have this space. We've just taken a new location which is twice as big as our current one. We're in a one-month transition so now she's stacking them in the bathroom. Every day another 20 to 30 boxes arrive and because we haven't quite expanded at the same rate our distribution. That's where we're at. We're in a little fix.”

P 3: Informant #2.docx - 3:45

Codes:[Consumer Education/Awareness/Power - Family: System Efficiency]

“About reselling second hand clothes and I think that's a challenge. That's kind of a cultural shift as well. I think that will be another thing to be addressed.”

P 3: Informant #2.docx - 3:46

Codes:[Retail Take-Back Programs - Family: System Efficiency]

“We recently had a take back program with the specialty stores because they wanted to participate. Also, Nordstroms has approached us.”

P 3: Informant #2.docx - 3:47

Codes:[Consumer Education/Awareness/Power - Family: System Efficiency]

“Women come into our store, we have an opportunity to share with them other information that they might not normally have access to. This is a perfect example.”

P 3: Informant #2.docx - 3:48

Codes:[Clothing Quality - Family: Donations]

“How do you bring a population along that has a certain idea about used clothes? I think the interesting thing for us is that the desire for Eileen fisher clothes is high enough that they will sort of step over that initial hesitation.”

P 3: Informant #2.docx - 3:49

Codes:[Consumer Education/Awareness/Power - Family: System Efficiency]

“I would want them to know that they can make a difference. I think how you spend your money can have ... I mean it's the old almighty dollar. Speak with your money.”

P 3: Informant #2.docx - 3:50

Codes:[Consumption - Family: System Efficiency] [Fast Fashion & Disposable Clothing - Family: Donations]

“I think in buying things with an intrinsic value instead of that disposable society mentality, which happens with a lot of the clothes you might find at, what's that called? It's not Century 21.”

P 3: Informant #2.docx - 3:51

Codes:[Environmental Impact - Family: Regional Impact]

“We're also moving toward a much more eco-based product. That was another initiative there.”

P 3: Informant #2.docx - 3:52

Codes:[Textiles in the Waste stream/Landfill - Family: Regional Impact]

“There's still waste. Our challenge is what do we do with the textile waste?”

P 4: Informant #3.docx - 4:1

Codes:[Collection Bins - Family: System Efficiency]

“We have a number of collection bins in town. A lot of them are provided by private entities, but by commission or invitation in the cases of the ones that are on town property.”

P 4: Informant #3.docx - 4:2

Codes:[Consumer Education/Awareness/Power - Family: System Efficiency] [Reuse -

Family: Textile Recycling System]

“It was really eye-opening for me about just the main message that not only can wearable clothing be donated for reuse, which most people are aware of; that torn, worn, ripped, stained stuff, as well as non-clothing items.”

P 4: Informant #3.docx - 4:3**Codes:[Textiles in the Waste stream/Landfill - Family: Regional Impact]**

“Everything from bedding to drapes, to the stuffed animals, to pillows; just how much was being missed. Up to 85% and the fact that it was such a significant portion of the waste stream too.”

P 4: Informant #3.docx - 4:6**Codes:[Consumer Education/Awareness/Power - Family: System Efficiency]**

“Well I think the best way to really reduce the waste and increase the diversion is to get the message out there to everybody. That there’s just so much more that they can donate for not only reuse, but for recycling or recovering in one form or another.”

P 4: Informant #3.docx - 4:7**Codes:[Textiles in the Waste stream/Landfill - Family: Regional Impact]**

“If everyone in New York and throughout the world, but especially in America, knew that, then instead of 15% of being recovered, we could hopefully get a lot closer to 100%. I mean it makes up 5% or more of the waste stream.”

P 4: Informant #3.docx - 4:9**Codes:[Consumer Education/Awareness/Power - Family: System Efficiency]**

“Well one of them is just a lack of knowledge or awareness on the part of the public in general about what can be recycled and donated.”

P 4: Informant #3.docx - 4:12**Codes:[Collection Bins - Family: System Efficiency]**

“Also the, at least perception on the part of a lot of municipal officials and members of the public that these bins are going to attract a lot of unnecessary garbage; unrelated garbage that just gets piled. I see that by the clothing donation bins in our community sometimes where people will just say, “Oh, here’s a donation bin, let’s just put other random stuff that’s not connected to it at all on the ground by it.”

P 4: Informant #3.docx - 4:13**Codes:[Consumer Education/Awareness/Power - Family: System Efficiency]**

“I think the main opportunity is just the PR opportunity, the outreach opportunity.”

P 4: Informant #3.docx - 4:14**Codes:[Fiber Conversion/Downcycling - Family: Textile Recycling System] [Wiper Rags - Family: Textile Recycling System]**

“No, it’s going to be made into carpet pad. It’s going to be auto insulation. That’s going to be wiping rags, or there are other people who want your uncle’s leisure suit from the ‘70s or whatever too.”

P 4: Informant #3.docx - 4:16**Codes: [Wiper Rags - Family: Textile Recycling System]**

“Plus it’s also a valuable component of it which supports the whole infrastructure, the collection infrastructure. Without the wiping rag industry we would have a harder time getting the rest of the stuff collected too.”

P 4: Informant #3.docx - 4:17**Codes: [New York State - Family: Regional Impact]**

“I foresee and I also hope that our efforts will be successful, and not just in New York State but organizations like SMART are helping to spread it throughout other states.”

P 4: Informant #3.docx - 4:18**Codes: [Environmental Impact - Family: Regional Impact] [Municipal/Government Involvement- Family: System Efficiency]**

“That municipalities will get more involved and see the economic value as well as the environmental impacts of it. I do hope that they get a lot more involved not just to keep litter off the streets, but just as a benefit to the community.”

P 4: Informant #3.docx - 4:19**Codes: [Municipal/Government Involvement- Family: System Efficiency]**

“I do hope that they get a lot more involved not just to keep litter off the streets, but just as a benefit to the community. Service to their residents, and increasing diversion towards zero waste; it’s what everybody’s goal is when it comes to waste production.”

P 4: Informant #3.docx - 4:20**Codes: [New York State - Family: Regional Impact]**

“I can see probably more at a State level.”

P 4: Informant #3.docx - 4:21**Codes: [Economic Value - Family: Regional Impact]**

“I think New York’s headed that way eventually. There’s no reason why textiles wouldn’t be banned from the landfill either because there is such value.”

P 4: Informant #3.docx - 4:23**Codes: [Economic Value - Family: Regional Impact]**

“It’s because even though it’s a smaller percentage of the waste stream, it has the economic value and infrastructures are already in place.”

P 4: Informant #3.docx - 4:24**Codes: [Textile Recycling System - Family: Textile Recycling System]**

“There would be even more collection opportunities. The reverse supply chain, as he likes to call it, is already in place. We just have to take advantage of it better.”

P 4: Informant #3.docx - 4:25

Codes:[Consumer Education/Awareness/Power - Family: System Efficiency] [Fast Fashion & Disposable Clothing - Family: Donations]

“I think that there is a lot of potential for cultural change around the idea that clothing is disposable. I don’t think that that ought to be a concept that it’s disposable.”

P 4: Informant #3.docx - 4:29

Codes:[Consumer Education/Awareness/Power - Family: System Efficiency] [Handling/Collection Costs - Family: System Efficiency]

“I guess there is a little bit of PR marketing costs; outreach costs. You need to have somebody coordinating ideally all of the different bins. Making sure that it doesn’t become detrimental to the community, but you usually have somebody in place already doing waste disposal and recycling already for a community. I don’t really see a lot of cost to be able to do it; depending on how you choose to do it.”

P 4: Informant #3.docx - 4:30

Codes:[Non-Profits/Charities Sorting/Collection/Resale Business - Family: Textile Recycling System]

“I think philosophically that municipalities like to work with nonprofits. I mean we’re nonprofit. Government’s nonprofit to begin with, and our mission is to serve; rather than a profit motive. All things being equal, if we had a choice of a well organized, efficient, dependable for-profit company versus a nonprofit who could provide the same level of service. We’d probably choose a nonprofit.”

P 4: Informant #3.docx - 4:32

Codes:[Resale Industry - Family: Textile Recycling System]

“The reality of it is that whereas there are a lot of nonprofits that have thrift stores.”

P 4: Informant #3.docx - 4:34

Codes:[Consumer Education/Awareness/Power - Family: System Efficiency]

“Our vision is to really have a coordinated effort through a variety of channels, print and broadcast media; the internet; in-person events; social media. Just as many ways as possible to get all levels of the industry as well as every type of group in the community to become involved. You can have schools, and churches, and nonprofits involved; as well as the municipality itself.”

P 4: Informant #3.docx - 4:35

Codes:[New York State - Family: Regional Impact]

“This is exciting not only for other states, but for our own. NYSAR is 27 years old, I believe, but this is the first time that we’ve ever done a coordinated statewide effort on one topic in this way.”

P 4: Informant #3.docx - 4:36

Codes:[Consumer Education/Awareness/Power - Family: System Efficiency]

“This is the first time that we’re really at this level doing this level of coordination on one issue

and trying to really provide the resources; the media packets; the educational resources, and the level of conference and training that we have.”

P 4: Informant #3.docx - 4:38

Codes:[Convenience - Family: Donations]

“As far as one thing I’d like to know from consumers, I guess it would be how can we make it easiest for you to donate all this stuff?”

P 4: Informant #3.docx - 4:41

Codes:[Fashion Industry - Family: System Efficiency]

“One of the missing pieces right now is the retail apparel industry. That is a huge opportunity, and there are a couple of companies I’m sure you’re familiar with that are starting to do that.”

P 4: Informant #3.docx - 4:43

Codes:[Fashion Industry - Family: System Efficiency]

“Both from the manufacturing side, the design side they’re designed not to be disposed of. Designed to be recycled or be reused, and then the retail industry as well getting involved in helping with that message.”

P 4: Informant #3.docx - 4:44

Codes:[Retail Take-Back Programs - Family: System Efficiency]

“All of your department stores and your retail clothing stores should be doing that as well.”

P 4: Informant #3.docx - 4:45

Codes:[Collection Bins - Family: System Efficiency]

“Some of the other obstacles have to do with the battle of the bin’s type of organization or companies. Often the companies are competing for the same kinds of locations. It’s all related to the bin location and proliferation issue”

P 4: Informant #3.docx - 4:46

Codes:[Reuse - Family: Textile Recycling System]

“I think that if it’s going to be wearable clothing then we should wear it.”

P 4: Informant #3.docx - 4:47

Codes:[Fiber Conversion/Downcycling - Family: Textile Recycling System]

“If it’s going to be more permanent use like insulation or any of the other number of things that textiles are usually made into, that would be beneficial or would be preferable.”

P 4: Informant #3.docx - 4:48

Codes:[Wiper Rags - Family: Textile Recycling System]

“If the choice is between making wiping rags from virgin material and recovered material, it’s something that’s needed in the industry, so I don’t really have a problem with wiping rags. “

P 4: Informant #3.docx - 4:49

Codes:[Textile Recovery/Landfill Diversion - Family: Textile Recycling System]

“Service to their residents, and increasing diversion towards zero waste; it’s what everybody’s

goal is when it comes to waste production.”

P 4: Informant #3.docx - 4:50

Codes: [Fast Fashion & Disposable Clothing - Family: Donations]

“I don’t like the idea that we’re trying to make it more disposable than it already is. A lot of people only wear clothing for months or a year or two, and then it’s outdated and they want to get something else.”

P 4: Informant #3.docx - 4:51

Codes: [Handling/Collection Costs - Family: System Efficiency] [Municipal/Government Involvement- Family: System Efficiency]

“Well that’s one of the things that’s really a great opportunity for a municipalities about textile waste. If we chose to do collection ourselves, have collection drives, then there would be some costs associated with it. There’s still going to be a net income overall, unless it was a very unsuccessful collection drive.”

P 4: Informant #3.docx - 4:52

Codes: [Non-Profits/Charities Sorting/Collection/Resale Business - Family: Textile Recycling System]

“There are some like Salvation Army and Goodwill that have collection bins and things like that. There are at least in this area and in other places in New York State that I’m aware of too.”

P 4: Informant #3.docx - 4:53

Codes: [Non-Profits/Charities Sorting/Collection/Resale Business - Family: Textile Recycling System]

“Nonprofits are struggling usually for funding; for profits, if they are successful, have more financial resources to be able to do that.”

P 4: Informant #3.docx - 4:54

Codes: [Textile Recycling System - Family: Textile Recycling System]

“We can get all the stakeholders together in the for profits, the nonprofits, the collectors, the processors. Municipalities, higher education, apparel industry, retail. Through collaborative efforts we can really address the issue.”

P 4: Informant #3.docx - 4:55

Codes: [Collection Bins - Family: System Efficiency]

“There are already so many collection bins and everything.”

P 4: Informant #3.docx - 4:56

Codes: [Convenience - Family: Donations]

“Would you support curbside collection of this? Would it make it easy enough that you would even support it with a tax increase?”

P 4: Informant #3.docx - 4:57

Codes: [Textile Recycling System - Family: Textile Recycling System]

One of the missing pieces I think in the current; we’ve got this existing reverse supply chain for

100 years or more in some cases. We just need to spread the word to have more material donated for recycling or recovery, and reuse.

P 4: Informant #3.docx - 4:58

Codes:[Fashion Industry - Family: System Efficiency]

“Both the design industry as far as designing stuff and the manufacturing industry I guess, with the labeling, the tags, and designing it such that the messaging is there.”

P 5: Informant #4.docx - 5:1

Codes:[Volume of Clothing/Textile Waste - Family: Regional Impact]

“Well, we own and operate what we believe is North America's oldest textile recycling facility. In this facility we're processing approximately 70,000 pounds of textile waste a day. That is post-consumer textile waste a day. In terms of units, that probably equates to, although there's no exact science to determine this number, but probably roughly 140,000 units a day.”

P 5: Informant #4.docx - 5:2

Codes:[For-Profit Sorters/Collection Businesses - Family: Textile Recycling System] [Non-Profits/Charities Sorting/Collection/Resale Business - Family: Textile Recycling System]

“We take and purchase this material. We don't take it. We purchase this material from mostly the charitable, from large charities. We negotiate on the spot market for the purchase of what the industry refers to as institutional mixed rags. Institutional meaning that the rags or the clothing has been looked at by the charity.”

P 5: Informant #4.docx - 5:3

Codes:[For-Profit Sorters/Collection Businesses - Family: Textile Recycling System] [Textiles in the Waste stream/Landfill - Family: Regional Impact]

“We take all this material into our facility. We sort and separate it. Again, it's very labor-intensive. Essentially we make three product categories from post-consumer textile waste.”

P 5: Informant #4.docx - 5:4

Codes:[Wiper Rags - Family: Textile Recycling System]

“30 percent of this material we would classify as wiping rags or reclaimed wipers. It's materials that will end up being sold to producers or wholesalers that turn it into rags.”

P 5: Informant #4.docx - 5:5

Codes:[Recycling - Family: Textile Recycling System]

“20 percent of this material will be sold as recycled fiber. As you know, it's materials used in products like carpet padding, sound-deadening material in your car or home insulation.”

P 5: Informant #4.docx - 5:6

Codes:[Exports - Family: Textile Recycling System] [Resale Industry - Family: Textile Recycling System]

“Then roughly about 45 percent of the clothing can and is used as clothing. It's reused as clothing. That is predominantly exported to developing countries around the world. We do business in 45 developing countries.”

P 5: Informant #4.docx - 5:7**Codes:[Resale Industry - Family: Textile Recycling System]**

“Very small sliver of that pie. I would say less than 2 percent of the material you would classify as ... I lump that into that 45 percent of usable clothing. Less than 2 percent of the total pie would be classified for vintage or domestic sale. You're talking there about very specific stylized items or items of vintage clothing.”

P 5: Informant #4.docx - 5:8**Codes:[Textile Recovery/Landfill Diversion - Family: Textile Recycling System]**

“From looking at it truly in a macro-economic sense or big picture sense in terms of what we see, what industry professionals see is sort of the next step or solution to diverting more textile waste, if I understand your question correctly”

P 5: Informant #4.docx - 5:10**Codes:[Non-Profits/Charities Sorting/Collection/Resale Business - Family: Textile Recycling System]**

“I can't imagine you'd find one in a hundred that would tell you that Goodwill wasn't a good worthwhile nonprofit.”

P 5: Informant #4.docx - 5:11**Codes:[Fiber Conversion/Downcycling - Family: Textile Recycling System] [Wiper Rags - Family: Textile Recycling System]**

“Then you have the private sector side, which includes processors like us, wiper people, and people in the fiber industry.”

P 5: Informant #4.docx - 5:12**Codes:[Textile Recycling System - Family: Textile Recycling System]**

“We clearly have a model and we have a road map in terms of legislation culturally, and how do we affect that as an industry, and how do the private-sector stakeholders affect that.”

P 5: Informant #4.docx - 5:15**Codes:[Fashion Industry - Family: System Efficiency] [Recycling - Family: Textile Recycling System] [Reuse - Family: Textile Recycling System]**

“We're going to need it to go from hopefully in some period of time, if in the next few years, from a few companies to many companies that advocate for reuse and recycling, and incorporate reuse and recycling programs as part of their model.”

P 5: Informant #4.docx - 5:18**Codes:[Recycling - Family: Textile Recycling System]**

“The big thing, if you really back up and take a higher altitude view, most recyclables, paper, plastic, glass, typical recyclables that we think of here in the US, if you look at the averages for even the ones that are most recycled, typically they fall in and around the 50 percent threshold. Some are 60. Some are 40. Probably in a real-world scenario, if we ever got anywhere close to that number, it would be a huge win.”

P 5: Informant #4.docx - 5:19**Codes:[Textile Recovery/Landfill Diversion - Family: Textile Recycling System]**

“As you look at the issue here on a ... I'll go back to your question in just a moment. If you look at the issue here, if we increase diversion from 15 to 20 percent, and you just multiply that times the 25 billion pounds, it's a significant number. It makes a significant difference.”

P 5: Informant #4.docx - 5:20**Codes:[Fashion Industry - Family: System Efficiency] [For-Profit Sorters/Collection Businesses - Family: Textile Recycling System]**

“They've got one player on the private-sector side, who's made somewhat significant impact working with apparel retailers.”

P 5: Informant #4.docx - 5:21**Codes:[Fashion Industry - Family: System Efficiency] [Recycling - Family: Textile Recycling System] [Textile Recovery/Landfill Diversion - Family: Textile Recycling System]**

“This is just sort of I'm thinking about this out loud, but my sense is that if you the consumer aren't even participating in those specific retail programs, you're more aware of the concept of donation in recycling, during the life cycle of that garment. It doesn't really surprise most sustainability and recycling professionals when they learn that Europe diverts higher percentages of their post-consumer textile waste.”

P 5: Informant #4.docx - 5:22**Codes:[Municipal/Government Involvement- Family: System Efficiency]**

“On a state-by-state basis, we are seeing for the first time states, like New York State and Massachusetts, and there's a couple of other east coast leading states, Rhode Island, I don't want leave anyone off the list, and Connecticut are two others that have taken proactive steps to educate the municipalities within their borders to recycle, or to advocate for donation and recycling of post-consumer textile waste.”

P 5: Informant #4.docx - 5:26**Codes:[Fashion Industry - Family: System Efficiency]**

“Without quoting these exact definition, extended producer responsibilities are currently laws in, I believe, 17 states that, how do we say this, that push the responsibility to the manufacturers, brands and retailers to take some responsibility for the recycling of that specific product. Whatever the product they're dealing.”

P 5: Informant #4.docx - 5:28**Codes:[Consumer Education/Awareness/Power - Family: System Efficiency]**

“Wearonaterecycle.org, and that that in itself, the idea behind that would be both a cue to consumers, that the URL itself was a cue to consumers and an actionable platform which would get people to donate and recycle more clothing, and it would cover everyone in the spectrum, and whatever your reuse and recycling program was.”

P 5: Informant #4.docx - 5:29**Codes:[Fashion Industry - Family: System Efficiency]**

“In other words, when Patagonia has a closed-loop system with Tasian, which is phenomenal and very well-respected, it covers that all the way through and to programs like Levi's that just simply advocate for donate or recycling, to any other program, similar to an H&M. So the concept to donate and recycle covers everyone, regardless of what your specific corporate directives are.”

P 5: Informant #4.docx - 5:31 [We are hoping that the apparel..] (69:69) (Super)**Codes:[Fashion Industry - Family: System Efficiency]**

We are hoping that the apparel industry recognizes that. We feel in general that a lot of stakeholders that feel, including state governments, that that's a pretty small ask.

P 5: Informant #4.docx - 5:33**Codes:[Fashion Industry - Family: System Efficiency]**

“It's extremely efficient industry, and that is actually essentially looking to foot all the cost, is my sense of it. We can't do it alone—we need apparel industry. If you looked at what their added cost might be, I mean, from messaging and a marketing standpoint, it's a fraction of where our costs are. There is this global reverse, robust reverse supply chain, that's continually looking for the raw material.”

P 5: Informant #4.docx - 5:34**Codes:[Handling/Collection Costs - Family: System Efficiency]**

“Those costs are generally absorbed by that supply chain. That's the amazing thing. Anytime you have private sector industry, recycling involve in something, obviously you know it's an efficient industry.”

P 5: Informant #4.docx - 5:38**Codes:[Consumer Education/Awareness/Power - Family: System Efficiency]**

“I think probably the most important point that the public needs to know is worn or torn clothing, must be donated or recycled. How we go about getting that message out, that's really the big question. Obviously, that sentiment, that thought of donate or recycle, is not as ... Like what you said, we as an industry, needed to be or should be where were will be diverting more waste.”

P 5: Informant #4.docx - 5:39**Codes:[Textiles in the Waste stream/Landfill - Family: Regional Impact]**

“The things that I always remind people, is that those aren't industry supplied facts and figures. I feel like everyone talks about this 15 and 85 percent, those are federal EPA, and the most interesting to me, is when you look at the waste composition studies on a state-by-state municipal basis, it almost always come out in and around that 5% number. It's staggering how consistent that number is. I think some cities pop up even a little higher. New York City came in like 6.8 or closer to 7.”

P 5: Informant #4.docx - 5:40**Codes:[Consumer Education/Awareness/Power - Family: System Efficiency]**

“It's just so young, and there are a lot of 20 something, spending money on disposable fashion. I think without a doubt, it's just that message of donate and recycle.”

P 5: Informant #4.docx - 5:41**Codes:[Recycling - Family: Textile Recycling System]**

“If you think about all the things when you recycle, in your normal day, some people ... I live in the burbs so I have to do this. We sure separate. We have to separate our glass from our plastic, and we have to look at ... Sometimes they will go as far as saying, "Don't put any non clear plastic.”

P 5: Informant #4.docx - 5:42**Codes:[Consumer Education/Awareness/Power - Family: System Efficiency]**

“The point that we as an industry are constantly need to strive and make an effort to create more knowledge about, is that when it comes to your clothing, don't discriminate.”

P 5: Informant #4.docx - 5:47**Codes:[Non-Profits/Charities Sorting/Collection/Resale Business - Family: Textile Recycling System]**

“We do a Product Stewardship institute about textile recycling. One of the subjects that was covered or one of the people that gotten the call, was an executive from Banton, and they do a really innovative program with Goodwill, where they collect, she claimed, in the millions of pounds, but 300 stores nationwide with Banton. A great program for Goodwill industries. How much of a factor they offer incentives and discounts. How much of a factor those discounts are, in inducing or actuating the donation in that specific instance.”

P 5: Informant #4.docx - 5:50**Codes:[Textile Recycling System - Family: Textile Recycling System]**

“We have clearly identified an issue. Everyone sees that there is this reverse, robust supply chain out there, an entire industry to handle this including the second-hand charities that exist, which are a big part of the picture.”

P 5: Informant #4.docx - 5:51**Codes:[Textile Recycling System - Family: Textile Recycling System]**

“Our goal as an industry is to take a material that's currently only diverted somewhere in the neighborhood of 15 percent and try to push that up somewhat significantly.”

P 5: Informant #4.docx - 5:52**Codes:[Fashion Industry - Family: System Efficiency]**

“I believe that we'll need great companies like some of the apparel companies that were in that room, to help us lead the way and get there.”

P 5: Informant #4.docx - 5:53

Codes:[Fashion Industry - Family: System Efficiency] [Recycling - Family: Textile Recycling System] [Reuse - Family: Textile Recycling System]

“Companies like Levi's that are actively getting involved in the messaging. Other great companies like a Patagonia that's really taking up and standing behind and supporting the concept of reuse. I think a big part of their Common Threads Initiative at this moment is to support reuse. Online they have a little slightly different model than eBay, but again it's a phenomenal take on it. Then there's the whole list of consumer-facing companies. Companies like H&M, Northface, that also advocate for reuse and recycling.”

P 5: Informant #4.docx - 5:54

Codes:[Fast Fashion & Disposable Clothing - Family: Donations]

“It takes fast fashion and makes it sustainable fashion, and gives that garment a second life.”

P 5: Informant #4.docx - 5:55

Codes:[Textile Recycling System - Family: Textile Recycling System]

“Textile Recycling, will take a consumer's garment that's been donated to a charity, and it could come through our facility in as little as 15 to 30 days later, and literally be either in that reverse supply chain, as a wiper, fiber or apparel garment, within another 30 days, so we close the loop in 60 days.”

P 5: Informant #4.docx - 5:56

Codes:[Convenience - Family: Donations]

“Ninety percent of consumers will not want to walk the extra 25 feet, dump in that box, simple out of convenience.”

P 5: Informant #4.docx - 5:57

Codes:[Fashion Industry - Family: System Efficiency]

“If you look at mass market fashion, I don't even know all the figures, but I believe there is tens of thousands of fashion companies, not hundreds of thousands of companies out there. If we just had some more participation and cooperation, just on the messaging alone, I think that it would help us to increase diversion rates to some degree.”

P 5: Informant #4.docx - 5:58

Codes:[Municipal/Government Involvement- Family: System Efficiency]

“If we get municipalities to also recognize that clothing can and should be donated and recycled, and that it's 5% of their solid waste stream, they are going to be more proactive.”

P 6: Informant #5.docx - 6:1

Codes:[Textiles in the Waste stream/Landfill - Family: Regional Impact]

“In terms of my involvement with the issue, New York City throws out 200,000 tons of clothing every year.”

P 6: Informant #5.docx - 6:2

Codes: [Non-Profits/Charities Sorting/Collection/Resale Business - Family: Textile Recycling System]

“We've always had a large network of non-profits and thrift stores, and we used to do huge collection events, but obviously that wasn't meeting the need that was there”.

P 6: Informant #5.docx - 6:3

Codes: [Convenience - Family: Donations]

“Refashion was established to make this a more convenient and easy process for people to give a second life or recycle their textiles.”

P 6: Informant #5.docx - 6:4

Codes: [Fast Fashion & Disposable Clothing - Family: Donations] [Textiles in the Waste stream/Landfill - Family: Regional Impact]

“I think that there's a throwaway culture of clothing right now. Clothing isn't intended to last maybe more than a season. Because people buy clothing in the short-term and think about it as a short-term item, it becomes disposable like anything else you would throw in the trash.”

P 6: Informant #5.docx - 6:5

Codes: [Economic Value - Family: Regional Impact] [Environmental Impact - Family: Regional Impact]

“When you're tired of it or it rips, the 1st inclination, I think, is that it's done. The obstacle then is reframing that as, this is something that still has value. I think that's a big shift. Not just value in like, "I can sell it to a consignment store," but value in that the material itself has value in terms of an environment resource. That shift, I think, is a difficult thing to make people see.”

P 6: Informant #5.docx - 6:7

Codes: [Non-Profits/Charities Sorting/Collection/Resale Business - Family: Textile Recycling System]

“I think, first and foremost, because there are so many non-profits and charitable organizations who have a use for this, I think first and foremost they should be step 1.”

P 6: Informant #5.docx - 6:9

Codes: [Fiber Conversion/Downcycling - Family: Textile Recycling System] [Recycling - Family: Textile Recycling System]

“In terms of recycling, I know there's a lot of different things that the clothing could become and it depends on the grade and the type and how well it's sorted. We tend to tell people, because they want to know what happens to the clothing, that it all gets shredded and then becomes either the felt in the back of cars or mattress stuffing. There is a use for it. Maybe not reuse or recycling, downcycling, I guess.”

P 6: Informant #5.docx - 6:11

Codes:[Exports - Family: Textile Recycling System] [Fiber Conversion/Downcycling - Family: Textile Recycling System] [Non-Profits/Charities Sorting/Collection/Resale Business - Family: Textile Recycling System] [Recycling - Family: Textile Recycling System]

“Right now, we're doing about, I want to say, 25 to 30% is resold at Housing Works' store. Probably another 25, 30% is in their warehouse sales. Then they do have a partnership with Haiti where they ship back and forth to a non-profit in Haiti. Then the rest gets recycled. We're about 50% recycling, 50, 60% recycling, maybe a little more, a little less, depending on the month. That changes.”

P 6: Informant #5.docx - 6:12

Codes:[Textile Recovery/Landfill Diversion - Family: Textile Recycling System]

“I know, for our program, because we have a zero landfill policy unless someone actually dumps trash on a clothing and it's unusable, but outside of that, we have a zero landfill policy.”

P 6: Informant #5.docx - 6:13

Codes:[Fiber Conversion/Downcycling - Family: Textile Recycling System] [Recycling - Family: Textile Recycling System]

“That's how I see it happening, based on the tonnage and stuff that we have, is it's reused first and then recycling, and then, as far as my understanding of what the recycling is, is yeah, it's mostly shredded and then downcycled into ... I've heard insulation. I've heard carpet padding.”

P 6: Informant #5.docx - 6:14

Codes:[Fashion Industry - Family: System Efficiency]

“Whether that means the actual designers or if it means the retailers, I think that there needs to be a little bit more responsibility on either side of that. Maybe that means making department stores host a Refashion bin, so people can take stuff back there, before they buy new stuff. I would like to see the manufacturing side more involved in the end life of what's happening.”

P 6: Informant #5.docx - 6:17

Codes:[Fashion Industry - Family: System Efficiency]

“I know this is already sort of happening in San Francisco, but they do have a lot more commercial buy-in. I think they partner with H&M and then American Eagle is now involved. I think that sort of, not necessarily sponsorship, but just involvement and support of the idea, either in the type of clothing they sell or as a collection point. I think things are going to move more in that direction.”

P 6: Informant #5.docx - 6:21

Codes:[Volume of Clothing/Textile Waste - Family: Regional Impact]

“This is just for New York City, is that 200,000. It's just New York City. That comes from a waste characterization study. Originally we did one in 2004-2005. That study, the 200,000 tons, included carpet, clothing, shoes, accessories, and then towels and linens. That's why we take all of that outside of carpet. What's interesting is in the new study, which I actually got to do, was part of the waste sort and sort through the trash and see what's in there. We didn't include carpet

in the clothing numbers because I wanted a better, more accurate count of what Refashion has to gain. So we didn't include carpet, and it's still 200,000 tons.”

P 6: Informant #5.docx - 6:22

Codes: [Fast Fashion & Disposable Clothing - Family: Donations]

“I think the problem is ... Yeah, it's a throwaway, temporary thing. Because fashion is so quickly evolving and trends happen so quickly and it's profitable to function that way, because you're continuously having consumers buy new things to keep up with trends, I think on the consumer side people don't think about durability anymore. They don't think about the history of clothing or the materials.”

P 6: Informant #5.docx - 6:26

Codes: [Volume of Clothing/Textile Waste - Family: Regional Impact]

“Yeah. I don't think that there's any way that 1 group alone could manage the amount of material that's being thrown away.”

P 6: Informant #5.docx - 6:27

Codes: [Consumer Education/Awareness/Power - Family: System Efficiency]

“Yeah. We need partners. We need help. It's not just on the collection side. It's on the education side too.”

P 6: Informant #5.docx - 6:29

Codes: [Consumer Education/Awareness/Power - Family: System Efficiency]

“If we could be a little bit more transparent about the problem that we have and what it looks like and where it's coming from, I think if people can see it, it's easier to understand than us just saying 200,000 tons. To most people, that's just a number. I would love for there to be some sort of imagery.”

P 6: Informant #5.docx - 6:30

Codes: [Consumer Education/Awareness/Power - Family: System Efficiency] [Fashion Industry - Family: System Efficiency]

“I think that, at the point of purchase, it needs to be encouraged. Whether that's ... I know that if we're ever going to get retailers and manufacturers involved, I think the way to do it is, if you bring your old clothes back, we'll give you a 10% discount on a new purchase, some sort of incentive. I think incentives are what people will respond to most when you're trying to get them to consider what to do with their waste.

P 6: Informant #5.docx - 6:31

Codes: [Volume of Clothing/Textile Waste - Family: Regional Impact]

“What struck me most the 1st time I went was, there's a few sections of the warehouse, and they were like, "This is the Refashion section and this is one day's worth of collections." It is a 1/4 of a warehouse. It's like 20 bags high. I was climbing it like a mountain. To see that like that's 1 day that all of this is coming in, it just puts things in perspective.”

P 6: Informant #5.docx - 6:32

Codes: [Volume of Clothing/Textile Waste - Family: Regional Impact]

“There's stuff with price tags still on it that people haven't even worn and it's being thrown out. It's the volume and then it's the type of material.”

P 6: Informant #5.docx - 6:35

Codes:[Consumer Education/Awareness/Power - Family: System Efficiency]

“Don't just throw it out because it has a hole. Just because it's worn doesn't mean it's unusable or has no value. I guess that's 1 thing that I would want to make sure people knew.”

P 6: Informant #5.docx - 6:37

Codes:[Economic Value - Family: Regional Impact]

“There's still stuff that gets given to them that they don't give out. That still is creating a profit or some kind of market for them.”

P 6: Informant #5.docx - 6:38

Codes:[Collection Bins - Family: System Efficiency]

“Ironically, one of the big ways that we can show the value of this material is that there are a ton of now clothing bins on the sidewalk, not all of them charitable, some of them for profit.”

P 6: Informant #5.docx - 6:39

Codes:[Economic Value - Family: Regional Impact]

“The growth of that, I think, really speaks to the fact that this material doesn't need to go to landfill if people are investing resources to collect it and make this their business model. I think it speaks to the value of the material.”

P 6: Informant #5.docx - 6:40

Codes:[Recycling - Family: Textile Recycling System] [Reuse - Family: Textile Recycling System]

“Let's get that reuse sector involved. Then I think, outside of that, once they have resold or reused what they could, then there's definitely a market for recycling.”

P 6: Informant #5.docx - 6:41

Codes:[Consumer Education/Awareness/Power - Family: System Efficiency]

“I think designers could also change clothing in a way that's more sustainable and durable in the 1st place and educate the consumers. They really have an easier job of educating consumers than the back-end does, than we do, because we're seeing all of the waste but we don't see them at the point of purchase to make a more informed decision.”

P 6: Informant #5.docx - 6:42

Codes:[Volume of Clothing/Textile Waste - Family: Regional Impact]

“I think that's the challenge. I mean, 200,000 tons just in New York City. That's a crazy amount of clothing. Even if we're reselling half of that, that leaves another 100,000 tons that could be going all to recycling, but I think that it could be split up.”

P 6: Informant #5.docx - 6:43**Codes: [Handling/Collection Costs - Family: System Efficiency]**

“For Refashion, to the city, it's technically no cost except for my salary and then a dispatcher and a sort of an outreach person. There's 3 people hired by the city to run the program. Outside of that though, the program's self-sustaining which is unique in contract structure.”

P 6: Informant #5.docx - 6:44**Codes: [Fashion Industry - Family: System Efficiency]**

“That's really where we need buy-in from retailers or from local groups, community centers.”

P 6: Informant #5.docx - 6:45**Codes: [Consumer Education/Awareness/Power - Family: System Efficiency]**

“I think people assume that the second you put it in the bin, it gets put right on the back of a homeless person. There's that misconception of, "Why would I recycle it if they can't clothe somebody on the street?" There's confusion about that middle part of the process of how this actually benefits homeless people.”

P 7: Informant #6.docx - 7:1**Codes: [Resale Industry - Family: Textile Recycling System]**

“We purchase used clothing for cash on the spot, and then we re-sell it to the public.”

P 7: Informant #6.docx - 7:3**Codes: [Clothing Quality - Family: Donations]**

“We're seeing those items come in a lot more frequently lately, like Coach or Armani or Boss, the higher end stuff.”

P 7: Informant #6.docx - 7:5**Codes: [Volume of Clothing/Textile Waste - Family: Regional Impact]**

“I feel like we've always had a huge volume of stuff that goes into our donation pile. That's about the same.”

P 7: Informant #6.docx - 7:8**Codes: [Recycling - Family: Textile Recycling System]**

“I feel like recycle anything, everything we can, especially clothing. There's so many people out there, who can't afford clothes. To throw it away is just senseless.”

P 7: Informant #6.docx - 7:10**Codes: [Recycling - Family: Textile Recycling System]**

“The trends and the fashion changes so much. I feel like if me, as a business owner, and the public does their duty to recycle what they can. Even if you feel like you need to go purchase that new item, you can always go recycle it somewhere.”

P 7: Informant #6.docx - 7:11**Codes: [Recycling - Family: Textile Recycling System]**

“If you don't want that new item, then great. But if you feel like you can also go buy something

used, then you won't feel as guilty for going out to buy something new.”

P 7: Informant #6.docx - 7:12

Codes:[Textile Recycling System - Family: Textile Recycling System]

“I feel the industry has changed in the sense that back 20 years ago, when I was doing it, was almost like taboo in a sense to buy used clothing.”

P 8: Informant #7.docx - 8:1

Codes:[Convenience - Family: Donations]

“My experience through several different kinds of commodities, including textiles, is that community collection events are the most convenient for the general public.”

P 8: Informant #7.docx - 8:3

Codes:[Exports - Family: Textile Recycling System]

“There's people starving all over the world. They can use our used goods, and there's innovative people all over the world that can take materials and leave all them cottage industries out of them, and that should be exploited.”

P 8: Informant #7.docx - 8:4

Codes:[Consumer Education/Awareness/Power - Family: System Efficiency]

“Basically, they're set up more as a PR program to let the community know that the official communities involved, rather than actually to get the community involved in the process.”

P 8: Informant #7.docx - 8:9

Codes:[Handling/Collection Costs - Family: System Efficiency]

“The cost of collecting and accumulating is minimal. The bins for the way I'm doing it, if you were doing it as a curbside program, there's a couple.”

P 8: Informant #7.docx - 8:10

Codes:[Contamination - Family: Donations] [Handling/Collection Costs - Family: System Efficiency]

“The biggest one is weather. Usually you're exposing textiles to weather, and in order to make them useful, you're going to have to wash them. That's an extra expense that probably won't be tolerated by the community or by the industry”

P 8: Informant #7.docx - 8:11

Codes:[Consumer Education/Awareness/Power - Family: System Efficiency]

“That's one reason, the other reason is the majority of my experience has been that if you put out collection bins in convenient locations, the general public will then be educated on the use of them, and they will use them in responsible ways.”

P 8: Informant #7.docx - 8:12

Codes:[Fiber Conversion/Downcycling - Family: Textile Recycling System]

“They don't care about the wet, the mildew, the carpets, and actually, when it comes to these low grades, the guys up in Syracuse said over and over again that, oh, there's lots of uses for this, you can make carpet backing, and you can use it as insulation in automobiles, and all this sort of

stuff.”

P 8: Informant #7.docx - 8:13

Codes:[Textiles in the Waste stream/Landfill - Family: Regional Impact]

“Not worth bothering with, you pay 4 cents, send it to the landfill, be done with it.”

P 8: Informant #7.docx - 8:14

Codes:[Economic Value - Family: Regional Impact]

“They're after the bottom line, and why should I give you my stuff for you to make money out front? All I'm doing is saving 4 cents. Why should I bother with that when ... ?”

P 8: Informant #7.docx - 8:18

Codes:[Exports - Family: Textile Recycling System]

“They cannot see that if they're selling used Jordache jeans to kids in Mexico that that kid's making enough money, and he wants to buy new ones. They cannot see this as a market development ploy, but it is.”

P 8: Informant #7.docx - 8:20

Codes:[New York State - Family: Regional Impact]

“I think New York State will be a model for it, but it's likely to take a few generations.”

P 8: Informant #7.docx - 8:22

Codes:[Consumer Education/Awareness/Power - Family: System Efficiency] [Economic Value - Family: Regional Impact]

“This is an extraordinary opportunity for the general public to educate themselves and do it cost effectively, and produce enough income to help other social projects like gang prevention or doing something with street kids or doing something with their middle class kids, as far as that's concerned. You know they're always looking for money for sports events, for any number of different things.”

P 8: Informant #7.docx - 8:24

Codes:[Consumption - Family: System Efficiency]

“You're giving people in other countries who have subsistence circumstance an opportunity to develop a better lifestyle, and you're giving people in the more developed countries like the United States an opportunity to dispose of items, so that they can buy more.”

P 8: Informant #7.docx - 8:25

Codes:[Consumption - Family: System Efficiency]

“Clears their closets out, they can go buy more stuff.”

P 8: Informant #7.docx - 8:26

Codes:[Economic Value - Family: Regional Impact] [New York State - Family: Regional Impact]

“Let's get New York state moving collecting textiles. If we're only doing 15% now, and this is a scrap industry, and the scrap industry is notorious for a boom and bust economy because if you get everybody excited and you start doing 20%, then all of a sudden that's like 40% more

material than you had before, but where the hell's it going to go?"

P 9: Informant #8.docx - 9:2

Codes:[Wiper Rags - Family: Textile Recycling System]

"In Cleveland, and so back then, Cleveland was a huge industrial hub, and so there was big demand for schmattas at all the steel mills and all the car companies. [At 00:03:00] any time, a manufacturing entity needs is the schmattas, and back then, they didn't have synthetics. There were no paper towels, so schmattas was the only thing around, so it was a big business, so they got into that and it's evolved since then."

P 9: Informant #8.docx - 9:3

Codes:[Consumption - Family: System Efficiency] [Volume of Clothing/Textile Waste - Family: Regional Impact]

"When you look at a problem, the massive amounts of textiles that our population consumes and at the amount of it that [grosses 00:04:22] in landfill, you're still going to have to choose which part of the problem you're going to focus on. Are you going to try and get people to consume less textiles? That's probably not the whole battle and you're not going."

P 9: Informant #8.docx - 9:4

Codes:[Textile Recovery/Landfill Diversion - Family: Textile Recycling System]

"If you accept the fact that people are going to consume what they are going to consume, then you're overall not age, and say to yourself, "Now, how do I mitigate the problem? How do I make a difference?" That's where diversion comes in."

P 9: Informant #8.docx - 9:5

Codes:[Consumer Education/Awareness/Power - Family: System Efficiency]

"I think the biggest challenge towards increasing diversion rates is probably just raising an awareness in people. I know personally, I meet people that are not involved in the industry and they have never heard about the industry. They have no idea what we do or the fact that it exists. That's going to have to change if you want to build just a general awareness among people that they should be recycling their old clothes."

P 9: Informant #8.docx - 9:6

Codes:[Consumer Education/Awareness/Power - Family: System Efficiency]

"Most people don't even want to give something to a Goodwill if it's not tip-top shape because they don't realize that our industry can actually make good use of it. I would say awareness is the biggest challenge."

P 9: Informant #8.docx - 9:7

Codes:[Fashion Industry - Family: System Efficiency]

"That's an evolving issue. That's something that we're trying to figure out. I would say one of the leading trends now, where we think we can make a big impact, is by working with the manufacturers and the retailers. That's the point of contact where the clothing changes hands for the first time, and so that's probably where you're going to have the biggest impact in terms of having the idea of textile recycling resonate with people and told right when they make the purchase, "Hey, when you're done with this, there's something that you can do with it," it's

probably the best way to make it stick.”

P 9: Informant #8.docx - 9:8

**Codes:[Consumer Education/Awareness/Power - Family: System Efficiency]
[Municipal/Government Involvement- Family: System Efficiency] [Non-Profits/Charities
Sorting/Collection/Resale Business - Family: Textile Recycling System]**

“Through our trade association, they work with schools to educate kids. They have a whole curriculum. Nonprofits do a lot of work, even community organizations like churches. Governments are now starting to get involved. New York City has a program.”

P 9: Informant #8.docx - 9:9

Codes:[Fashion Industry - Family: System Efficiency]

“Probably the biggest point of impact is right when they make that purchase.”

P 9: Informant #8.docx - 9:10

Codes:[Textiles in the Waste stream/Landfill - Family: Regional Impact]

“There’s no real way for it to filter through the used clothing system. Used clothing, for it to filter through that system, has to wind up in the hands of the consumer, but by definition, it’s pre-consumer, so the consumer will never see it. Really, that should be a closed-loop system within the manufacturing.”

P 9: Informant #8.docx - 9:11

Codes:[Consumer Education/Awareness/Power - Family: System Efficiency]

“The toughest part about what we do with post-consumer is we have to individually reach out to 300,000,000 people ...”

P 9: Informant #8.docx - 9:12

Codes:[Municipal/Government Involvement- Family: System Efficiency]

“The question of regulation, that is very much tied into the future of the business. I would say that if companies, manufacturers and retailers, start to get ahead of the issue and start to address it proactively, then governments will feel less pressure to regulate. Governments are busy enough as it is. They’ve got big problems to deal with.”

P 9: Informant #8.docx - 9:13

Codes:[Municipal/Government Involvement- Family: System Efficiency]

“For the first time, governments across the country, at both the municipal and the state level, are being introduced to our industry for the first time, in a bad way. I’ve been to a lot of those city council meetings.”

P 9: Informant #8.docx - 9:14

Codes:[Textile Recycling System - Family: Textile Recycling System]

“A lot of those state-level meetings have been [trans 00:12:24] general where they’re trying to understand how this industry works, how the for-profits work with the nonprofits, what happens to the used clothing, so now that they’ve gained this awareness, the next step is they’re probably going to want to look into the fact that 5% of their landfills are full of this stuff, and they’re going to want to do something about it, so when they get to that [inflection 00:12:46] point, if the

manufacturers and retailers have caught up with them, there may be less likely to regulate.”

P 9: Informant #8.docx - 9:15

Codes: [Non-Profits/Charities Sorting/Collection/Resale Business - Family: Textile Recycling System]

“They have thrift stores, they have collections, but they’re also in the charity business.”

P 9: Informant #8.docx - 9:16

Codes: [Non-Profits/Charities Sorting/Collection/Resale Business - Family: Textile Recycling System] [Textile Recycling System - Family: Textile Recycling System]

“For them, collections and thrift stores have nice synergies with their charity mission because they are, at each of those points, both at the thrift store and at the collections point, they’re interacting with people that potentially are also supporters of the charity, the volunteers of the charity, so it’s, even from the charity side, it’s not a waste of time being in front of people that are donating used clothing or selling to people that are buying used clothing.”

P 9: Informant #8.docx - 9:17

Codes: [Exports - Family: Textile Recycling System]

“For them to start getting into shredding clothing and opening up operations in Africa, that totally takes them out of their comfort zone.”

P 9: Informant #8.docx - 9:22

Codes: [Clothing Quality - Family: Donations] [Consumption - Family: System Efficiency] [Fast Fashion & Disposable Clothing - Family: Donations]

“That being said, it’s not just the fast-fashion that’s growing in terms of consumption. You also have high-quality goods. Consumers are consuming a lot more of that. That stuff’s becoming cheaper.”

P 9: Informant #8.docx - 9:23

Codes: [Clothing Quality - Family: Donations]

“We see a lot more fast-fashion in what we collect, but we also see a lot of higher-quality stuff coming in as well. That mixes up. It’s just constantly changing, so it’s just something that we have to adapt to.”

P 9: Informant #8.docx - 9:24

Codes: [Collection Bins - Family: System Efficiency] [Environmental Impact - Family: Regional Impact]

“Bins seem to be one of our most cost-efficient ways to do it, also one of the most environmentally-friendly ways to do it, because if you think about it, let’s say you put a bin at a grocery store. People are coming there anyways, so they’re not expending any additional to whereas there’s another method of collection, home-to-home pickups, phone solicitations, that is a very expensive way to do it, and you’re also expending a lot of carbon per pound.”

P 9: Informant #8.docx - 9:29**Codes:[Exports - Family: Textile Recycling System]**

“Africa runs off of used clothing. Everybody buys it. In our globalized world, I believe you should give the consumer what they want. Who are we to tell one billion Africans that we’re not going to export used clothing to them because it’s for their own good? If they want it, sell it to them.”

P 9: Informant #8.docx - 9:30**Codes:[Consumer Education/Awareness/Power - Family: System Efficiency]**

“There’s a long-term track, just the recycling range program, which is a school curriculum that the trade association put together, and it was distributing to schools across the country.”

P 9: Informant #8.docx - 9:34**Codes:[Resale Industry - Family: Textile Recycling System]**

“I think it all leads back to the recession. With the gloom in the U.S. thrift industry, and U.S. thrifts have been growing tremendously. That is, the fact that there is consumer demand across the country and that has led to more awareness.”

P 9: Informant #8.docx - 9:35**Codes:[Resale Industry - Family: Textile Recycling System]**

“People now are more aware of the thrift industry. It’s not just a novelty. People shop regularly at thrift and even people that can afford to shop at pricier options at the mall, they’ve gotten a taste of thrift and they like it and they keep coming back, and so now if your average consumer, let’s say, goes to the mall once a month, maybe once every two months they also stop in at the thrift stores.”

P 9: Informant #8.docx - 9:36**Codes:[Resale Industry - Family: Textile Recycling System]**

“That awareness created a lot of demand, which has raised the price of used clothing, and which has brought a lot more money into the industry, and so you see a lot of new entities getting involved. You can see a lot of financing coming in, private equity companies taking note, so that that has all led to a higher profile for the industry.”

P 9: Informant #8.docx - 9:37**Codes:[New York State - Family: Regional Impact]**

“I think New York State already is a model. I know if, within our company, so we work in a number of states across the country, and we are actively trying to introduce the New York State plan to these other states as we’re working with the folks at NYSAR I’m to connect them with people that we work with in other states”

P 9: Informant #8.docx - 9:38**Codes:[Textiles in the Waste stream/Landfill - Family: Regional Impact]**

“Why are landfills, why do they have 5% clothing?” is the way to get started. Once you start to ask that question, all of these start falling into place.”

P 9: Informant #8.docx - 9:40**Codes:[Textile Recovery/Landfill Diversion - Family: Textile Recycling System]**

“That being said, outside of the more legitimate charities that there are companies or they’re not-for-profits that have been set up whose stake in the mission is to keep textiles out of landfills”

P 9: Informant #8.docx - 9:41**Codes:[Clothing Quality - Family: Donations]**

“Even on a per-person basis, it seems to be growing. Clothing’s just getting cheaper and cheaper.”

P 9: Informant #8.docx - 9:42**Codes:[Clothing Quality - Family: Donations]**

“If cheap clothing is more affordable, then higher-quality clothing should also be more affordable, but I don’t see that slowing down, that process.”

P 9: Informant #8.docx - 9:43 [**Codes:[Collection Bins - Family: System Efficiency]**

“We operate bins. All we have to do is send our truck to the grocery store.”

P 9: Informant #8.docx - 9:44**Codes:[Municipal/Government Involvement- Family: System Efficiency]**

“Anytime you get government involved in things, the costs tend to be a little bit higher, but generally, it’s all on the private side, whether for-profit or not-for-profit.”

P 9: Informant #8.docx - 9:45**Codes:[For-Profit Sorters/Collection Businesses - Family: Textile Recycling System] [Non-Profits/Charities Sorting/Collection/Resale Business - Family: Textile Recycling System]**

“A lot of for-profit and non-for-profit and actors in the industry are actually working with schools to launch collection drives and introduce the curriculum to them, and so that’s something that’s going to start to bear fruit in the years ahead.”

P 9: Informant #8.docx - 9:46**Codes:[Municipal/Government Involvement- Family: System Efficiency]**

“More immediately, short- and medium-term, I think working with governments is important, like within New York City.”

P 9: Informant #8.docx - 9:47**Codes:[Recycling - Family: Textile Recycling System]**

“One thing that we’d love to see is to have textiles start to be classified as a recyclable material, which right now it isn’t, so if that started to change, it would immediately raise awareness because it would automatically put into place all kinds of regulations that apply to other items like paper and plastics and metals.”

P 9: Informant #8.docx - 9:48**Codes:[Consumer Education/Awareness/Power - Family: System Efficiency]**

“Then raising consumer awareness and having that feed into awareness among retailers and

manufacturers, probably that's the way to get the biggest impact.”

P 9: Informant #8.docx - 9:49

Codes:[Fashion Industry - Family: System Efficiency] [Municipal/Government Involvement- Family: System Efficiency] [Textile Recovery/Landfill Diversion - Family: Textile Recycling System]

“You see some companies leading the way with it, Patagonia, for instance. As that starts to spread, it'll have a massive impact, so you take all that and put it together, schools, governments, consumers, and then retailers and manufacturers, and I think you very quickly can start to see diversion rates similar to what we see in Europe.”

P 9: Informant #8.docx - 9:50

Codes:[Textile Recycling System - Family: Textile Recycling System]

“It's a confusing industry, but as soon as you hone in on that question or that you come to that realization that 5% of our landfills are used clothing, within six months you can figure it out.”

P 9: Informant #8.docx - 9:51

Codes:[New York State - Family: Regional Impact]

“You talk to a lot of people, you talk to the nonprofits, the for-profits, and just [set 00:30:10] the folks in New York State [to 00:30:10], but now that there's a model for it in New York State.”

P10: Informant #9.docx - 10:6

Codes:[Contamination - Family: Donations]

“And if it's what we call contaminated, the Goodwill will just through it out. And if it's contaminated when it gets to the graders, they'll through it out.”

P10: Informant #9.docx - 10:7

Codes:[Contamination - Family: Donations]

“I mean for the most part if I go onto a trailer ... and our biggest concern about contamination is wet, you know, if the clothes get wet. But you can tell the minute you go on a trailer full of clothes, bales, you can there there's a contaminated bale on it because you sell the mold and the mildew.”

P10: Informant #9.docx - 10:8

Codes:[Consumer Education/Awareness/Power - Family: System Efficiency]

“I'm thinking it's just cost and it's public awareness”.

P10: Informant #9.docx - 10:9

Codes:[Contamination - Family: Donations]

“Their biggest thing was contamination, mold, mildew. The clothes weren't clean.”

P10: Informant #9.docx - 10:10

Codes:[Consumer Education/Awareness/Power - Family: System Efficiency]

“It is getting the public knowledge that they had ... if you're going to put it out for recycling, so when it's out by the curbside, it's not getting wet.”

P10: Informant #9.docx - 10:12**Codes: [Handling/Collection Costs - Family: System Efficiency]**

“I think cost is part of the reason a lot of municipalities won't do it. And the other thing is getting the public onboard with it.”

P10: Informant #9.docx - 10:13**Codes: [Consumer Education/Awareness/Power - Family: System Efficiency]**

Well, you know, I guess it's just through the media, through the social media, the municipalities getting out and being aggressive in their recycling programs.

P10: Informant #9.docx - 10:14**Codes: [Consumer Education/Awareness/Power - Family: System Efficiency]**

“It's education to let them know that it's going to be, you know, recycled, reused.”

P10: Informant #9.docx - 10:15**Codes: [Municipal/Government Involvement- Family: System Efficiency]**

“It's just getting the counties, the landfills on board with it.”

P10: Informant #9.docx - 10:16**Codes: [Exports - Family: Textile Recycling System] [Recycling - Family: Textile Recycling System]**

“I think that if they can get the public, because it's a win/win for everybody, you know. And getting the public to actually recycle and know where the clothes go and how it could clothe, you know, kids overseas, and that aspect of it.”

P10: Informant #9.docx - 10:17**Codes: [Fiber Conversion/Downcycling - Family: Textile Recycling System]**

“And, you know, actually some clothes, the cottons and some clothes are actually going to make paper, you know, the cotton in it and stuff, and then, you know, the insulation in the bottom of their cars.”

P10: Informant #9.docx - 10:18**Codes: [Recycling - Family: Textile Recycling System]**

“So every item of clothing has a use, the zippers, the buttons, you know, the material. There's some use for it.”

P10: Informant #9.docx - 10:20**Codes: [Contamination - Family: Donations]**

“The sorting issue was a problem for us because it was in a landfill. And there were issues of odor, there were issues of varmints.”

P10: Informant #9.docx - 10:21**Codes: [Non-Profits/Charities Sorting/Collection/Resale Business - Family: Textile Recycling System]**

“There's a rescue mission right at the county landfill. So everything that they do, that they sort,

goes right over to the rescue mission.”

P10: Informant #9.docx - 10:22

Codes: [Non-Profits/Charities Sorting/Collection/Resale Business - Family: Textile Recycling System]

“So that's also a solution that can have a recycling center right there on the sites because I know that the rescue missions and the Salvation Armies right now are struggling for clothing.”

P10: Informant #9.docx - 10:23

Codes: [Collection Bins - Family: System Efficiency] [Economic Value - Family: Regional Impact]

“They aren't getting enough because you've got a lot of these places, what they call credential. All these little bins you see around, they're for sale. I mean there's companies and that's what they call credential. And they get a lot of money for that from the graders as a unsorted grade.”

P10: Informant #9.docx - 10:24

Codes: [Consumer Education/Awareness/Power - Family: System Efficiency]

“So a lot of that clothing is going in there and I think the public thinks that that's going to the Goodwills because they have to have a disclaimer on there that they're donating something to some church or whatever that's part of the deal.”

P10: Informant #9.docx - 10:25

Codes: [Non-Profits/Charities Sorting/Collection/Resale Business - Family: Textile Recycling System]

“So a lot of the clothes are going into that stream and they're getting past the Goodwills because the Goodwills ... Two things with the Goodwills. One is that they help clothe the poor at a reasonable price, plus they're making income from selling the excess clothing.”

P10: Informant #9.docx - 10:

Codes: [Economic Value - Family: Regional Impact]

“And everybody is in the game to make money.”

P10: Informant #9.docx - 10:27

Codes: [Economic Value - Family: Regional Impact]

“We're all in the game the make money, but ... and that's America, that's capitalism, but the bottom line is how it affects the Goodwills.”

P10: Informant #9.docx - 10:28

Codes: [Non-Profits/Charities Sorting/Collection/Resale Business - Family: Textile Recycling System]

“Instead of throwing it in a landfill, just give it to the Goodwills.”

P10: Informant #9.docx - 10:29

Codes: [Textile Recovery/Landfill Diversion - Family: Textile Recycling System]

“If you're not throwing that pair of jeans on the landfill, somebody is going to get that pair of

jeans, whether they get it from the credential or the guys at the Goodwills.”

P10: Informant #9.docx - 10:30

Codes:[Economic Value - Family: Regional Impact]

“No, because I think part of the consignment, because people pay a lot of money for clothes. We're in okay times, but we're still in tough times, so people are going to do everything that they can do to generate more income for their household.”

P10: Informant #9.docx - 10:31

Codes:[Textile Recycling System - Family: Textile Recycling System]

“But if it goes from the consignment shops to the Goodwills, you know, as an unsellable item or however, okay, now everybody is working together.”

P10: Informant #9.docx - 10:33 [

Codes:[Clothing Quality - Family: Donations]

“If people don't have the money to spend on new clothing, they're going to wear their old clothes more. That's probably part of the reason that they're getting a poorer quality clothing, because people are wearing them longer, you know.”

P10: Informant #9.docx - 10:35

Codes:[Reuse - Family: Textile Recycling System]

“So the laundries had to come up with ideas, what are we going to do, we have to get longer use out of this stuff. So they've changed detergents, they've put in mending shops, they'll dye.”

P10: Informant #9.docx - 10:36

Codes:[Textile Recovery/Landfill Diversion - Family: Textile Recycling System]

“So if they try to make the textile last longer, it's going to be less into the stream.”

P10: Informant #9.docx - 10:40

Codes:[Resale Industry - Family: Textile Recycling System]

“I'd bring them in and I'd sell them. This used to be a store. The storeroom was a huge store. And I sold ... and I used to get clothes from the corrections, I'd get clothes from the laundries, I'd sell work pants, work shirts.”

P10: Informant #9.docx - 10:41

Codes:[Resale Industry - Family: Textile Recycling System]

“Well, some of it is getting resold as clothing I'm sure, you know, and then some gets discarded into rags, you know, the sheets and stuff like that.”

P10: Informant #9.docx - 10:43

Codes:[Clothing Quality - Family: Donations]

“I think that they spend a lot of money on clothes. And I think that because we see here brand new clothes with tags still on them. And you know that that shirt was 40 or 50 bucks.”

P10: Informant #9.docx - 10:44**Codes:[Fast Fashion & Disposable Clothing - Family: Donations]**

“So we normally get a brand new sweatshirt because it's yellow as opposed to it being blue. And if that shirt was blue ... But the yellow sweatshirt may be popular six months from now. It depends.”

P10: Informant #9.docx - 10:46**Codes:[Consumption - Family: System Efficiency]**

“And all you really need to do is look in your closet. Okay? I know even myself, I'm guilty of it. I've got 10 pair of jeans. I wear a pair a day, you know. But they're the ones I like, you know. People love clothes. And they may set in their closet for two years. You'll end up with it, you know. And it's just your drawers are full, your closets are full. And if Kohl's is having a sale, oh, my God, I can go buy another pair of jeans if they're, you know ... I think that America is obsessed with clothes and shoes.”

P10: Informant #9.docx - 10:47**Codes:[Handling/Collection Costs - Family: System Efficiency]**

“Well, you've always got the cost of whoever is collecting, you've got the cost of the manpower, you've got the cost of the trucks, you've got the cost of the sorting, you've got the cost of, you know ... And then when we bring it into our place, our facility, we've got the manpower, which is huge.”

P10: Informant #9.docx - 10:48**Codes:[Handling/Collection Costs - Family: System Efficiency]**

“And, you know, you've got storage. You got to store the stuff. And then you've got to truck stuff, you know. So it's just like any other industry, the textile industry as I look at it is a commodity, you know.”

P10: Informant #9.docx - 10:49**Codes:[Economic Value - Family: Regional Impact]**

“And the prices vary with the economy. The prices vary with the demand. Like there was a cotton shortage about four years ago, drove the price of everything through the roof.”

P10: Informant #9.docx - 10:50**Codes:[Economic Value - Family: Regional Impact]**

“The cotton shortage affected us even with supply because they were figuring out a way to extract cotton from clothing. So a lot of the clothing went overseas or to these extraction places. So we had a hard time getting ... Like we may have a hard time getting colored polo because ... We may have had a hard time getting sweatshirts. So it's definitely driven by demand just like anything else.”

P10: Informant #9.docx - 10:52**Codes:[Municipal/Government Involvement- Family: System Efficiency]**

“Personally I think anything the state or government gets involved with makes things mucky.”

P10: Informant #9.docx - 10:54**Codes:[Consumer Education/Awareness/Power - Family: System Efficiency]**

“Educate the public. I mean the stakeholders don't get involved with that. The counties can take care of that.”

P10: Informant #9.docx - 10:55**Codes:[Textile Recycling System - Family: Textile Recycling System]**

“But stay out of the workings of it. Let the workings of the industry, like any industry, let it work, let people make money.”

P10: Informant #9.docx - 10:56**Codes:[Consumer Education/Awareness/Power - Family: System Efficiency]**

“You educate the people, it's going to generate more income for whoever, but education is the biggest key to making sure that you get the maximum use or amount of clothing out of the landfills and into the hands. Basically all you're doing is you're keeping clothes out of the landfill.”

P10: Informant #9.docx - 10:58**Codes:[Textiles in the Waste stream/Landfill - Family: Regional Impact]**

“So you're kind of recycling, but it is because you're just saving the landfills. You're extending the life of the landfill, I guess you could say.”

P10: Informant #9.docx - 10:59**Codes:[Refashioning/Up-Cycling - Family: System Efficiency]**

“I've seen furniture made out of rags, you know. They made furniture out of rags. It's the coolest thing I ever saw. Beautiful chairs out of ... They made them out of jeans.”

P10: Informant #9.docx - 10:60**Codes:[Fiber Conversion/Downcycling - Family: Textile Recycling System]**

“Think if everybody would make insulation and make it a higher value with jeans, because jeans and corduroy, they're kind of an item on the market that there's just really no use for it.”

P10: Informant #9.docx - 10:64**Codes:[Wiper Rags - Family: Textile Recycling System]**

“Everything. I mean the industry in this country depends on wiping cloths so they can run. And if they don't have them, it's like being out of gas. And everybody says, man, you've got a niche. In a way I have a niche market because I'm kind of like the only one that's ever ... you know, that does it in this area, but the overall market itself is huge. I'm just a spot compared to some of these rag companies.”

P10: Informant #9.docx - 10:65**Codes:[Economic Value - Family: Regional Impact]**

“You don't make the money you used make doing this business. I mean there used to be a lot of money in this business.”

P10: Informant #9.docx - 10:66**Codes:[For-Profit Sorters/Collection Businesses - Family: Textile Recycling System]**

“Well, I think what's happened in the market is a lot of the big boys came in and bought out the little guys.”

P10: Informant #9.docx - 10:68**Codes:[Economic Value - Family: Regional Impact]**

“They just drive the price down, drive the price down, drive the price down and eventually nobody makes any money.”

P10: Informant #9.docx - 10:69**Codes:[Economic Value - Family: Regional Impact]**

“And you keep working it and you have to ... In our business the price of colored polo hasn't gone down from the graders. It's probably going to be going up with your trucking and like that. So you're working on less and less margins.”

P10: Informant #9.docx - 10:71**Codes:[New York State - Family: Regional Impact]**

“Right now my graders, some of the stuff I get locally here, like out of Syracuse, out of Binghamton and I picked up from my institutional laundries.”

P10: Informant #9.docx - 10:72**Codes:[Exports - Family: Textile Recycling System]**

“Yeah, something like that. And you can drop that stuff out of it. But as long as the market bears, you know, as long as these graders ... Because that's the key part of the market is the export. It always has been. And as long as the countries that they have are willing to pay the price that they need to keep them alive, I personally don't see a problem with the good clothing going over there.”

P10: Informant #9.docx - 10:73**Codes:[Exports - Family: Textile Recycling System]**

“But, here again, if more clothing is coming into the stream, because let's face it, America doesn't export a lot of stuff anymore. Okay? We can export clothes that we have an abundance of overseas. The companies can make money. Companies hire people and people like me can employ people and sell a needed product, it's all good because we don't get a lot of that. And bringing stuff over, that's a whole different deal. We could be infiltrated, you know. But I don't have a problem because that's such a huge part of this industry.”

P10: Informant #9.docx - 10:74**Codes:[Wiper Rags - Family: Textile Recycling System]**

“Because the wiper side of it, they don't make money on selling the rag-out. The rag-out is just basically it's--covering their costs.”

P10: Informant #9.docx - 10:75**Codes: [Exports - Family: Textile Recycling System] [Wiper Rags - Family: Textile Recycling System]**

“There's no money in that, not what they can sell the stuff for. But it's just all part of the deal because ... And if any industry that's really as diversified as the wiper business where they can do foreign and domestic and maintain a balance, probably the wiper business is probably one of the best ones going because the trade deficit that we have in this country, it's everything coming over here, not as much going over there. So this way here, hey, it's going over. We've sending it from here to there and people are making money. And in business ... and you've been in business. You know, my philosophy is if you let the small good business guy make money, it'll fix everything.”

P10: Informant #9.docx - 10:77**Codes: [Non-Profits/Charities Sorting/Collection/Resale Business - Family: Textile Recycling System]**

“Well, our business takes the clothing, the waste clothing out of the stream through via the Goodwills.”

P10: Informant #9.docx - 10:78**Codes: [For-Profit Sorters/Collection Businesses - Family: Textile Recycling System]**

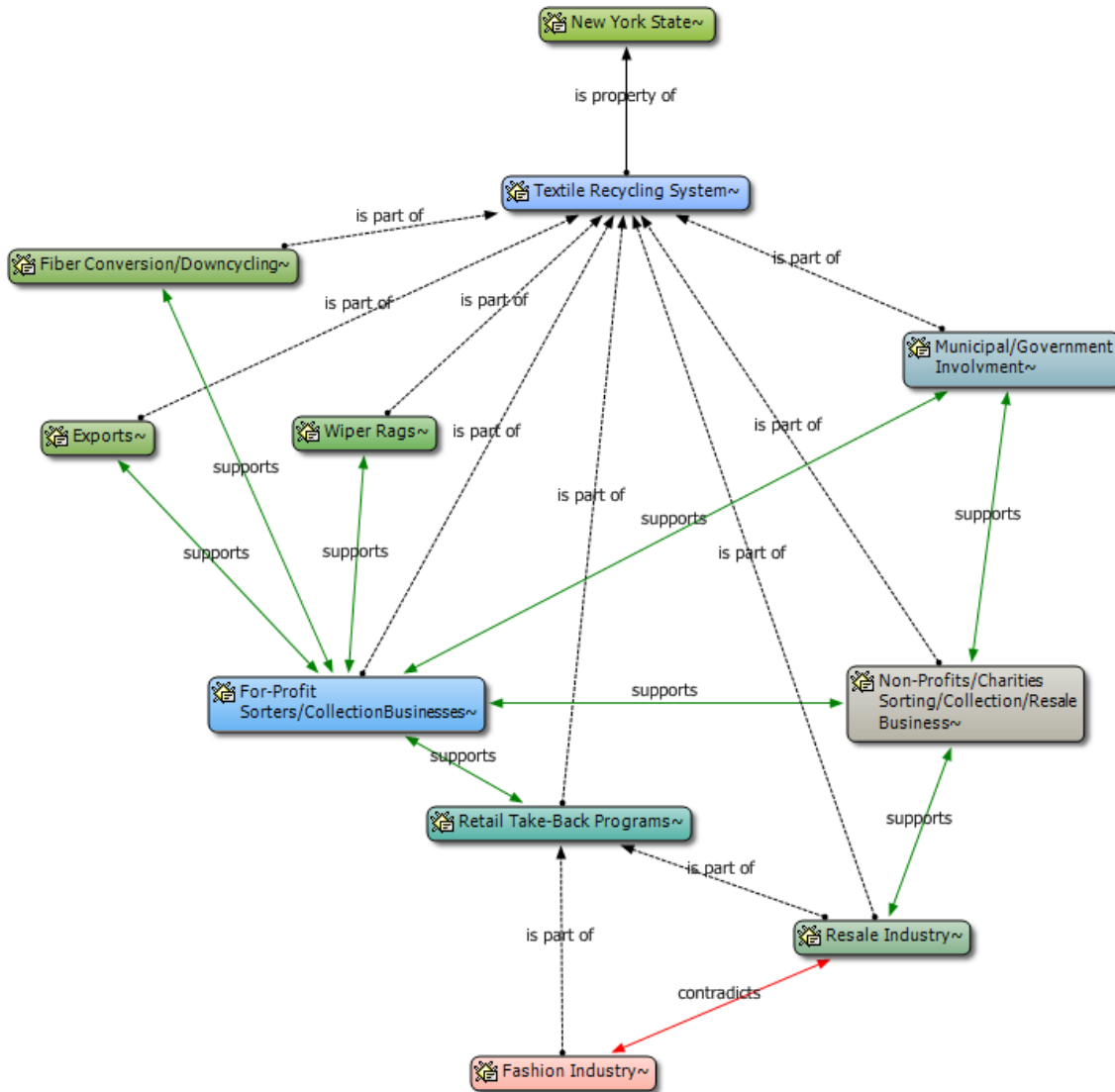
“The Goodwills will collect all the clothing, and then they bale it, and then sell it to the graders. From the graders we buy what they call the rag-out.”

P10: Informant #9.docx - 10:79**Codes: [Wiper Rags - Family: Textile Recycling System]**

“The rag-out is the clothes that they can't sell as whole clothing. So we buy it for wiper purposes.”

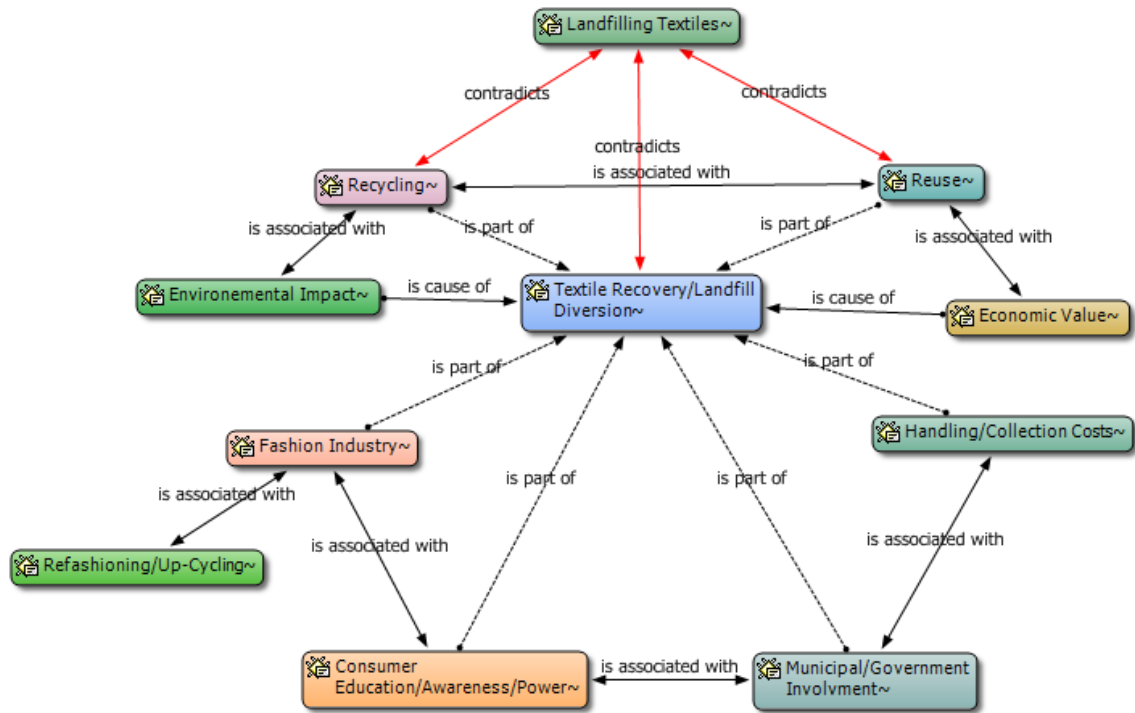
Appendix E

Network View of New York State Textile Recycling System Data



Appendix F

Network View of Textile Recovery/Landfill Diversion Data



Appendix G

Consumer Survey Text Entries

How do you dispose of Clothing that you no longer want? (Please select all that apply)-Other

burn
Burn with the trash
compost
compost clothing with natural fibers
Cottons get cut into pieces for quilts
cut out usable fabric from garment and make quilts!
cut up and make into other things, give to my sister to make rag rugs, make rag dolls
Donate to our church rummage sale
donate to school nurse
donate to the Cornell Costume and Textile Collection if it has some social/historical/cultural relevance
elementary school projects on reuse
Free pile at my house
give-away bench where I work
Have t-shirts made into memory quilts
I've thrown small all cotton items in the compost
If the item is really worn out, it gets thrown out except cotton fabrics get cut up into rags.
last resort--trash
mulch or use for ties in garden
Put cotton in municipal yard waste bin
put in a mending bag for years and then do one of the above ;)
quilt material
re-purpose into other items/pockets, shopping bags etc.
Refashion
Save to up cycle or fix some but have yet to get to it
Sell to second hand stores
Sew Green (Ithaca recycled fabric store)
sometimes there is a bin at the county recycling center
store in closet hoping to find a use
store in my basement
throw away if worn out

use as rags for cleaning

Use for pet bedding

use until it rips apart, then I re-use it for rags

want to make a quilt out of old treasured T-shirts

We have curbside pick-up from our recycler.

Yard sale

Total

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