

Clothing Waste Prevention:

Selected research results for reducing clothing wasted by consumers



 **King County**
Department of
Natural Resources and Parks
Solid Waste Division

 **Seattle
Public
Utilities**

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This report summarizes selected results of the King County LinkUp team’s 2017 research on clothing waste prevention, which included desktop research of existing programs and policies, as well as interviews with targeted local and global stakeholders. Programs, industry efforts, policies, and community activities included in this report prevent clothing waste generation or may have the potential to do so. This document is intended for use by King County and Seattle Public Utilities and others—public and private—interested in increasing clothing waste prevention in the Seattle and King County area.

INTRODUCTION

Local Context

The King County Solid Waste Division [LinkUp Program](#) in concert with Seattle Public Utilities has conducted several years of research and outreach targeting textiles consumption and disposal. From 2015 through 2017, King County and Seattle developed and administered the Threadcycle campaign to encourage residents to divert damaged and unwanted textiles from the waste stream by donating them to participating organizations. These organizations represented nine of the area’s largest used textile collectors, including thrift stores, charities, and for-profit businesses. Based on the 2017 post-campaign survey of these organizations, partners are starting to see an uptick in the collection of damaged textiles, perhaps as a result of the Threadcycle campaign. However, it is clear to King County and Seattle that increasing textile donation is only part of the solution in addressing wasted clothes, shoes, and linens.

Significantly, there are about 35,970 tons of textiles in the King County and Seattle combined annual municipal solid waste (MSW) stream (4 percent of all material disposed by weight).¹ According to the Secondary Materials and Reused Textiles (SMART), 95 percent of all discarded post-consumer textiles have reuse or recycling markets.^{2,3}

National Trends & Global Markets

US EPA has noted that textiles increased 71 percent in the municipal waste stream from 2000 to 2014. This growth is more than twice that of any other major waste category.

EPA studies further reveal that over this same time period of 2000-2014, textile *diversion rates* remained stagnant at 15 percent-16 percent.⁴ Given the heavy reliance on the export markets for

¹ Disposed textiles data were obtained from the Seattle Public Utilities’ 2014 Residential Waste Stream Composition Study, Seattle Public Utilities’ 2012 Commercial and Self-haul Waste Streams Composition Study, and 2015 King County Waste Characterization and Customer Survey Report. These reports were published by Cascadia Consulting Group and are available online from each agency at the following links:

<http://www.seattle.gov/util/Documents/Reports/SolidWasteReports/CompositionStudies/index.htm> , <https://kingcounty.gov/depts/dnpr/solid-waste/about/waste-monitoring/waste-documents.aspx>

² Post-Consumer Textiles: King County LinkUp Research Summary Report Pg. 1, King County, April 2014; rev. May 2015

³ Note, this research did not explore reduction of pre-consumer textiles – based on past research, there is not a significant enough volume of pre-consumer textiles waste in Seattle/King County to warrant focusing in this area.

⁴ RRS Website accessed on 10-10-17; <https://recycle.com/whats-new/textile-recovery/>

used textiles (the U.S. exports 57 percent of used clothing annually⁵), pressure caused by market shifts could drive those diversion rates lower.

The following are indications of risks in relying on clothing donation and overseas markets:

- Overseas demand for used textiles from the United Kingdom stalled in 2014 and is now falling, as have prices for goods and revenue from that trade.⁶
- Demand from overseas markets for used textiles is falling due to unrest in the Middle East, upward economic mobility in Eastern European countries, and a fire in the largest secondhand market in East Africa.⁷
- Other reasons for weakening international export markets in regions such as East Africa include competition from direct new clothing imports from China and desire for more robust domestic textile manufacturing industries, without competition from incoming used U.S. clothing.
- China's National Sword may impose further restrictions for American textile exports.

In 2016, King County and Seattle Public Utilities conducted research to explore and document the current conditions, trends, and possible threats to reuse and recycling of used textiles collected in the Pacific Northwest. The goal was in part to determine whether it was wise to continue encouraging consumers to donate more used and damaged textiles. The global nature of the market made determinations less clear cut, but feedback from our collection partners helped the team decide to continue Threadcycle messaging for a third year. However, in 2017, East African countries continued to move toward bans and China introduced the National Sword – both of which could impact use of local and national exportation to used textile markets abroad.

Shift in Focus: Preventing Clothing Waste

Fast fashion, a term coined to describe the fashion industry's ever-accelerating pace of releasing new styles at low cost, is a driver of increased clothing waste. As Huffington Post reported, "...at one time... there were two fashion seasons: Spring/Summer and Fall/Winter. Fast forward to 2014 and the fashion industry is churning out 52 'micro-seasons' per year. With new trends coming out every week, the goal of fast fashion is for consumers to buy as many garments as possible, as quickly as possible."⁸ According to Elizabeth Cline in her book *Overdressed: The Shockingly High Cost of Cheap Fashion*, fast fashion merchandise is typically priced much lower than the competition, operating on a business model of low quality/high volume.⁷ By contrast, *Slow fashion* is a movement against globalized mass production of clothing that involves ensuring product quality, reducing the social and environmental costs of resource extraction and production, and slowing consumption. It includes redesigning existing garments, designing enduring styles, using organic fibers and non-toxic dyes, using local materials and resources, small-scale or home production of clothes, buying more durable

⁵ Global Trade of Used Clothing (Updated: October 2015); <https://shenglufashion.wordpress.com/2015/09/30/global-trade-of-used-clothing/>

⁶ Textiles Market Situation Report, Spring 2016; WRAP; p.17. http://www.wrap.org.uk/sites/files/wrap/Textiles_Market_Situation_Report_2016.pdf

⁷ "Fast Fashion is Creating an Environmental Crisis," Newsweek, 9-1-16; <http://www.newsweek.com/2016/09/09/old-clothes-fashion-waste-crisis-494824.html>

⁸ Huffington Post: "5 Truths the Fashion Industry Doesn't Want You to Know," October 19, 2014: https://www.huffingtonpost.com/shannon-whitehead/5-truths-the-fast-fashion_b_5690575.html

clothing, buying vintage clothes, and shopping from smaller producers. Slow fashion offers an antidote to the impacts of fast fashion including excessive clothing waste.

In this context, a programmatic focus on *preventing clothing waste* from entering both the recycling and disposal streams could have a positive impact on Seattle/King County goals and activities concerning materials management, resource conservation, sustainable consumption, climate change, and local economic development.⁹

Definition: For this effort, clothing waste prevention encompasses activities that reduce the amount of post-consumer clothing waste generated, which would thereby reduce the amount of those materials ending up in the local (Seattle/King County) waste stream and waste streams elsewhere in the world.

Preventing clothing waste may also intersect with or result in other environmental, economic, and social benefits, such as:

- Reduction in energy consumption and production of GHG emissions
- Conservation of natural resources (including non-renewable resources) and embodied energy
- Reduction in pesticides and toxics from clothing production
- Increase in jobs or economic development (small business support)
- Building community and a sense of social connection; human well-being
- Increasing residents' financial security (spending less on clothes to keep up with ever changing fashion trends)
- Increasing equity through fair trade and non-sweatshop labor; increase in equitable levels of clothing consumption for those who are not able to obtain adequate clothing

Generally speaking, clothing waste prevention can be achieved through a number of consumer practices. Manufacturers and retailers can play a significant role toward encouraging these practices. Examples include the following (though there is overlap among the categories):

- Buy only what clothing is needed / use clothes longer
- Buy durable clothing
- Care for clothing to extend its useful life
- Repair clothes
- Repurpose clothes
- Refashion clothes and/or buy refashioned clothes (refashion involves modifying existing clothing to create new garments)
- Rent/Lease clothes
- Share clothes
- Reuse clothes (buy secondhand, use hand-me-downs, localized swaps)

⁹ For additional documentation of clothing as a high environmental impact material, see Oregon Department of Environmental Quality, "Background Paper: Reuse, Repair, and Product Lifespan Extension," June, 2016 (particularly p. 50). See also the Weidma report referenced by the DEQ paper (p.24) which documents clothing reuse as extremely environmentally significant.

Research Objectives: The following objectives guided the desktop research and interviews summarized in this document and provided a framework for the type of information these efforts were intended to collect.

- Identify players in the US and abroad (agencies, businesses, NGOs, institutions, etc.) engaging in, or planning to engage in, clothing waste prevention activities and the results of their past/current efforts.
- Identify waste prevention opportunities and lessons learned.
- Understand how players are looking upstream, at full life cycle carbon-based emissions and other means of program measurement that would be applicable to assessing clothing waste prevention, such as:
 - Economic development (for instance, more repair/tailoring shops)
 - Increases in local markets for used clothing
 - Reduction in purchases of new clothing
 - Increase in clothing swaps and people participating
 - Increased repair self-efficacy among community members
- Understand:
 - Waste prevention techniques
 - Existing model programs
 - Activities that organizations are participating in and how they are evaluating those activities and measuring results

Varying amounts of information were available for each of these topics. Overall, however, a picture emerged of a dynamic, growing awareness of, and interest in, the expanding stream of unwanted clothing and the need to do something beyond end-of-life management approaches such as disposal or simple reuse.

SUMMARY OF SELECT FINDINGS

In researching existing clothing waste prevention activities and opportunities, King County and Seattle Public Utilities focused on post-consumer waste as the best likely point of local government engagement. The team did not pursue manufacturer (pre-consumer) waste or other production concerns (such as toxicity reduction, lifecycle impact of fiber/material selection, etc.). In addition, given a well-developed local collection and retail system for used clothes, King County LinkUp's past research on post-consumer textiles, and King County and Seattle Public Utilities' Threadcycle partnerships with textile collectors, this report doesn't focus on donation opportunities. Determining connection points between prevention and local reuse will be a critical next step following this report.

In an effort to be concise, this report focuses on models within the fashion industry as well as consumer research and programs being conducted by governments, NGOs, and academia. Emphasis has been placed on retail and consumer actions that primarily promote less clothing consumption, and clothing longevity, care, repair, sharing, and repurposing.

Industry Efforts

Clothing Manufacturer (“Brand”) Initiatives

[Eileen Fisher](#): Women’s apparel line that has built a reputation in sustainable fashion. The brand’s actions to extend the life of their clothes include:

- **Professional repair** through their [Stitch In Time](#) program, offers customers the ability to bring Eileen Fisher clothes back to one of their retail locations for free repairs to fix damage such as broken zippers, missing buttons or small moth holes.
- **Consumer practices to extend garment life**: Eileen Fisher online resources inform customers in how to assess longer-lasting clothes, provide how-to steps on DIY repair and give recommendations for washing practices that will extend the life of products.
- **Clothing Take Back & Resale**: since 2009, the brand has collected 800,000 used Eileen Fisher clothes across the US via its [Renew](#) program.
 - **Gently worn clothes** are cleaned and resold online or at Eileen Fisher Renew stores including one in the Columbia City neighborhood of Seattle.
 - **Stained or slightly damaged clothes** are overdye or mended and resold at Renew stores.
 - **Damaged beyond repair clothes** are deconstructed and made into new clothes.

Supply of used/damaged Eileen Fisher clothes still exceeds the brand’s ability to repurpose and resell. The online newsletter, *Sustainable Brands*, noted recently that the brand is partnering with Nordstrom in a series of pop-up shops to increase sales.¹⁰

[Patagonia](#): An outdoor apparel and gear brand known for its environmental leadership. As noted by GreenBlue in their recent report, *Chemical Recycling*, Patagonia is “also the first apparel company to encourage customers to consume less of their products.” [GreenBlue](#) summarizes Patagonia’s multi-tiered strategy:

- **Designing durable**, high quality, functional products with a long service life backed by the company’s “[Ironclad Guarantee](#).”
- **Helping customers to extend the life of their clothes** through product care guides and “do it yourself” [repair guides](#).
- **Providing customers with incentives to trade-in used garments** which Patagonia will refurbish and sell on the [Worn Wear](#) website or recycle at the highest level of quality possible. Patagonia’s Worn Wear program employs 45 people, making about 40,000 repairs per year on clothing.¹¹
 - [Worn Wear events](#) for customers to learn how to patch gear, re-waterproof jackets, fix a zipper, and more. These are held out of a mobile repair vehicle at popular outdoor locations such as near Mt. Rainier, Mt. Baker, and abroad as well.
- A guarantee to its customers that **recyclable garments will never be landfilled or incinerated, or sold overseas in an uncontrolled environment**.

¹⁰ Sustainable Brands: “Trending: Improved Resource Efficiency Signals Major Win for Circularity in Fashion, Carpet, Steel.” Libby MacCarthy, December 11, 2017:

http://www.sustainablebrands.com/news_and_views/waste_not/libby_macCarthy/trending_improved_resource_efficiency_signals_major_win_cir.

¹¹ Valuing our Clothes: The Cost of UK Fashion,” WRAP, July, 2017. http://www.wrap.org.uk/sites/files/wrap/valuing-our-clothes-the-cost-of-uk-fashion_WRAP.pdf; p.37

- Keeping goods flowing in a system designed and controlled by Patagonia to ensure that highest and best use objectives are met.¹²

To read a more detailed summary of how Patagonia processes used clothes, read this [profile](#) published by GreenBlue. GreenBlue describes the brand's commitment to find strategies for "upcycling" worn out garments, use high percentages of recycled fibers, and help fund research in chemical recycling (process that turns used clothes back into virgin quality yarns for new clothing).

Industry Association Efforts

[Sustainable Apparel Coalition](#) (SAC) (California): "The Sustainable Apparel Coalition is the apparel, footwear, and home textile industry's foremost alliance for sustainable production. The Coalition's main focus is on building the Higg Index, a standardized supply chain measurement tool for all industry participants to understand the environmental, social, and labor impacts of making and selling their products and services."

The Higg Index [Brand Environment Module](#) has a sub-module for Care & Repair. Also of note is SAC's intention, as stated on its website, of piloting a consumer-facing label in Europe in 2016. This appears to be a work in progress.

Entrepreneurial Examples of Extending Clothing Use

[The Renewal Workshop](#): Based in Oregon, The Renewal Workshop (TRW) extends the useful life of "unsellable" or "non-wearable" garments that would have been sent to landfills or at best, downcycled into products of lower value. As GreenBlue's profile on the company describes, "The Renewal Workshop partners with apparel brands and retailers who pay a partnership fee for TRW to manage their non-wearable recovered apparel programs. Discarded apparel is sent to the Renewal Factory where it is sorted by its highest use value. The salvageable fraction is cleaned and repaired—"renewed"—and is resold either through channels owned or managed by brand partners or through The Renewal Workshop website."¹³

[Kallio](#): Small manufacturer that repurposes men's dress shirts into clothing for kids, ages infant to 8-years-old.

[Reclaimed](#): Made-in-the-USA social enterprise that creates one-of-a-kind upcycled dresses from vintage and gently worn clothing.

[Sword & Plough](#): Works with veterans to repurpose military surplus fabric into purses and bags.

Communities and Businesses Encouraging Direct Reuse

Clothing swaps or exchanges are a common way for people to extend the life of clothing and potentially displace their need to buy new clothing. Events can be informal, among groups of friends, or more structured. Some swap sites allow selling activity as well as exchange.

¹² "Chemical Recycling: Making Fiber-to-Fiber Recycling a Reality for Polyester Textiles" by GreenBlue, 2017: <http://greenblueorg.s3.amazonaws.com/smm/wp-content/uploads/2017/10/Chemical-Recycling-Making-Fiber-to-Fiber-Recycling-a-Reality-for-Polyester-Textiles-1.pdf>, p 19: <http://greenblueorg.s3.amazonaws.com/smm/wp-content/uploads/2017/10/Patagonia.pdf>

¹³ Ibid: p 18: <http://greenblueorg.s3.amazonaws.com/smm/wp-content/uploads/2017/10/The-Renewal-Workshop.pdf>

The issue of valuation is often raised at swaps, with some participants feeling that one-for-one item exchanges may not be equitable if the pieces are of perceived different value. To ameliorate this issue, most swaps have an entrance fee, with the fee being lower when you bring in more items. Some events also include a quality-check process prior to clothing being accepted, with one-for-one exchange coupons issued per piece of clothing accepted.¹⁴

- The [Seattle Clothing Exchange](#) is a Seattle institution. The well-attended 2017 event took place in February. The [Facebook page](#) can be viewed here. Future events are on hold due to overwhelming demand compared to available staff.
- City of Vancouver, B.C. [swap activity](#). Though this is a members-only page, one can view the explicit rules and terms for participation in the Description section on the right.
- [Wear and Share Clothing](#): This San Diego business offers a range of buy, sell, and exchange options. Note the detailed rules on the right side of the Facebook page. They also rent dresses and will facilitate customers renting their own dresses through the site.

Clothing rental or subscriptions through online services may or may not extend the life of clothes and linens.

- See [Wear and Share Clothing](#) above.
- [Rent the Runway](#): an online business that allows subscribers (\$139/month) access to an unlimited wardrobe, three at a time. Other options include Pay As You Rent and a StylePass Subscription. Some Unlimited items are available to buy.
- [Le Tote](#): Members/Customers are shipped boxes each month and can wear items as long as they want and then return them, or, buy items they want to keep.
- [MUD Jeans offers a leasing service](#) for jeans, complete with free repair.
- [Gwynnie Bee](#) allows members to rent and continuously exchange from one to three items of clothing, similar to the model Netflix used in its early days of DVD rental.
- [Coyuchi](#), a pioneer of organic cotton linens, and '[Coyuchi For Life](#),' a first-of-its-kind subscription service for environmentally sustainable sheets, towels, and duvet covers. With 'Coyuchi for Life,' users in Seattle subscribe to organic bed and bath linens in 6-, 12-, or 24-month increments. When the subscription period is up, customers send used linens back to be recycled or renewed and receive a new set. The Renewal Workshop (described above) is a partner with Coyuchi in renewing and reselling the used linens.¹⁵

Government & Non-Profit Programs

The following gives a sampling of approaches by government agencies:

¹⁴ Through additional, local research and interviews, more information is available on local swap pricing models, as well as resources on how to plan and structure a clothing swap.

¹⁵ Fast Company: "A Netflix for Bedding Gives Your Linens a Dignified Afterlife," Elizabeth Segran, October 19, 2017: <https://www.fastcompany.com/40465656/a-netflix-for-bedding-gives-your-linens-a-dignified-afterlife>

City Level

City of Portland's [Resourceful PDX](#), provides online education, information about events, and more to help residents waste fewer resources. With its tag line "Save more. Live more.", Resourceful PDX encourages residents to buy smart, reuse, borrow and share, and fix and maintain. Some content addresses clothing repair. Resourceful PDX is a member [Reuse Oregon](#), which is a state-wide network of businesses, organizations, and individuals that supports the reuse industry through education, policy, and promotion.

County Level

[King County EcoConsumer](#) public outreach program sponsors [free repair events](#) where residents can bring clothing and other household items to be fixed by experienced sewing and all-purpose fixers. Fixers also provide repair tips to people attending the events. In 2017, EcoConsumer held 20 repair events in various locations in King County (outside Seattle). Fixers worked on a total of 1,523 items, 584 (38 percent) of which involved sewing repairs. A high percentage of the sewing repairs requested for clothing were able to be performed successfully.

State Level

Oregon Department of Environmental Quality (DEQ): In late 2016 DEQ published their [Strategic Plan for Reuse, Repair, and Extending the Lifespan of Products in Oregon](#). This strategic plan provides a framework to direct the DEQ's work over a six-year period specific to reuse, repair, and extending the lifespan of products. The report notes that much research into reuse agrees on the following:

- Reuse and repair industries tend to be very local and the benefits of their impacts are specific to the communities in which the actions take place.
- Most repair providers and reuse outlets are small, with one or two employees, but the bulk of the sales and economic activity are generated by a few large entities.

The plan recommends a focus on textiles, "largely because of their significant environmental impacts both upstream in manufacturing and supply chains, and also related to disposal and reuse, as well as rapidly increasing material flows (use and disposal), growing private sector interest in durability and repair, and opportunities to engage with Oregon's apparel industry." For additional information on textiles, see the Strategic Plan's June, 2016 [Background Paper, Appendix G](#).

Eighteen options for textiles are presented in four overarching categories:

1. Improve collection of reusable textiles (Options 1 to 3)
2. Support textile reuse and repair infrastructure (Options 4 to 9)
3. Shift production and consumption to durable or repairable textiles (Options 10 to 14)
4. Provide public information (Options 15 to 18)

The plan recommends the following:

- Action: Execute a series of research projects that provide essential information about fundamental system issues in textile reuse, repair, and durability.

- Objective: Inform and optimize DEQ’s investment by providing needed information to better understand barriers and levers that can be utilized to extend the lifespan of textiles through durability, repair, and reuse.
- Possible Outcomes: Identify infrastructure needs and create a knowledge base on which DEQ and others can make decisions about potential future actions related to textiles. Again, see the full suite of potential textile-related actions in [Appendix G of the Background Paper](#).

DEQ recently issued a first round of grant funding to the reuse sector, awarding expansion grants in September 2017 to a clothing upcycling operation and a cobbler, with a goal of expanding reuse through equipment and labor support.

DEQ Interview Highlights

Interviewees: Elaine Blatt (*Natural Resource Specialist*), Babe O’Sullivan (*Urban Sustainability Directors Network, liaison to DEQ [now with DEQ]*), Simon Love (*Reuse, Repair and Product Lifespan Extension Specialist*)

- DEQ staff focused on workforce development within the repair industry sector, including on textiles. Stakeholder interviews informed a strategy to provide micro grants for clothing repair businesses to expand and develop their capacity and skills, and pay for additional equipment. They are hoping to identify a variety of “interventions” and entry points to the repair sector generally, which are mostly small businesses often owned and run by just a couple people.
- There are economic development gains to be made by expanding repair activity, but there is a lack of skilled labor to do the skilled work necessary to keep clothes and materials in use.
- The workforce is missing sewing skills; industrial sewing skills are largely gone from the US and have moved offshore. The US manufacturers who want to look at re-shoring can’t do it because they tend to need to scale up quickly and hire 100 industrial sewists at once, and there simply isn’t the trained workforce to do that domestically. Given that, DEQ had been considering creating a training curriculum to expand the number of available industrial sewists. The idea was that 95 percent of graduates would go into the large-scale private sector, with the remaining 5 percent being available for Oregon’s small and medium businesses. However, the big companies decided that it looked like government was about to fix the problem, and pulled out of providing any funding for creating a curriculum and training program. DEQ dropped the idea for now.
- DEQ administrative rules require local governments to promote or otherwise advance waste prevention and reuse. DEQ will provide two model campaigns to assist local governments in complying with these new rules, one of which will focus on textiles (the other will focus on food waste). As of mid-2017, the campaigns are under development.
- Having some measure of waste generation and waste prevention is desirable and could help guide selection of projects, but it is a big challenge to measure waste not generated. DEQ currently relies instead on other, more readily available metrics. One such metric that could be tracked is growth in the number of customers and the level of business at textile repair shops.
- DEQ would like to better understand when sharing and banking of clothing (e.g., rental, leasing, subscriptions) prevents waste and when these activities might create waste. They

compare this analysis to the related issue of when a consumer purchases a single piece of clothing s/he likes, only to discover they own few things that go with it and are in the position of needing to buy even more clothes to match it.

- DEQ is not specifically involved in repair cafes, but recently provided a grant for the City of Eugene to identify and test best practices to make such events successful. The goals of the grant are to 1) test actual impacts on waste, and 2) measure changes in general attitude and behavior. Eugene will be running three to four events over the next year and gathering results. They are interested in the potential impacts of repair events. They want to 1) increase the number of repaired items, and 2) drive people to seek out repair professionals and repair services, or to engage in DIY activity.

Training, Non-Profit and Lifestyle Efforts

[Ragfinery](#): In 2014, the Bellingham-based ReUse Works, added a new venture to its training and reuse program: Ragfinery. Built on the success of [Appliance Depot](#)'s business model, Ragfinery utilizes discarded textiles as source material to provide jobs, job training, resources for artists, and education about creative reuse.

[Project 333](#): Courtney Carver's Project 333 is "the minimalist fashion challenge that invites you to dress with 33 items or less for 3 months to bring more simplicity, love, and joy into your life." She gives talks that touch on, "her 'enough is enough' moment and what led her to give away most of her stuff, downsize to a small apartment, and leave a 20 year career in sales and marketing."

Abroad: NGOs & Governmental Initiatives

The British NGO, [WRAP](#), is on the forefront of clothing waste prevention research and program development. They are known for undertaking primary research investigating consumer attitudes about sustainable products. Parallel to this are WRAP's programs, based on their research, that encourage consumers to take a more sustainable approach to clothing. Much of WRAP's strategy is summarized in their [Sustainable Clothing Action Plan](#).¹⁶ Major components of the plan include: resource efficient business models, design for extending clothing life, fiber and fabric selection, consumer behavior and sustainable clothing, and reuse and recycling.

The following includes information from interviews with Liz Goodwin (Former Executive Director), Cecile Martin (Technical Specialist – Textiles), Andrew Gilbert (Key Account Manager).

- WRAP's 2017 report Valuing our Clothes: the cost of UK fashion looks at carbon, water, and waste impacts of the UK clothing industry. Within waste there are two targets: waste to landfill and supply chain waste. The latter is a proxy for production efficiency. The report shows there has been good progress on carbon savings, water, and waste-to-landfill. Though the report doesn't address clothing waste prevention, per se, it does provide the basis for why clothing waste prevention is important.
- WRAP's research includes explorations of consumer behavior, as well as careful investigation into extending durability and repair through design, care, washing, and repair. The 2013 Clothing Longevity and Measuring Active Use report documents consumer research and

¹⁶ Background information and relevant links for the SCAP are available [here](#).

provides a quantitative baseline to measure change in clothing ownership and use over time.¹⁷ The 2016 Measuring the Active Life of Clothing study offers research and metrics for use in local campaigns, marketing, and messaging based upon research that explored how long people keep and regularly wear their clothes.¹⁸ Such factors as changing body shape over time, the sporadic nature of special occasions, the distinction between “physical durability” and “emotional durability,”¹⁹ growth allowance for kids’ clothes, and other nuanced insights are explored.

- WRAP, in development of their 2017 Sustainable Clothing Action Plan, gathered stakeholders from many interested parties, including retailers, charities, and textile dismantlers/reprocessors to talk about the hierarchy of concerns in the clothing sector and to identify special projects that could be undertaken.
- WRAP’s original campaigns were developed out of internal conversations to focus on three market segments: Fashionistas, older Crafters who had sewing skills, and Mainstream Mums. Original campaigns were generally concerned with laundry and clothing care, revolving around the calendar-based themes, such as back-to-school. WRAP hopes to eventually develop three or four major campaigns, focusing messages on specific behavior-based (as opposed to demographic-based) consumer targets and behaviors toward shopping, clothing types, and waste.
- A signature effort is WRAP’s Love Your Clothes campaign, developed with industry organizations to help change the way UK consumers buy, use, care, repair, refashion, and dispose of their clothing. Among a variety of elements, the campaign includes 41 English-language films and how-to guides focusing on topics such as repair, stain removal, upcycling challenges, and fabric care.²⁰ It also has a “super crafter” network to drive consumers to clothing repair businesses, and has conducted events where a super crafter sets up a sewing machine and demonstrates clothing repair in clothing stores, treating it like a pop-up store.
- Another effort encourages customers to keep their clothes longer, particularly through advice on how to wash clothes for longevity. WRAP used survey data to assess which messages worked best and discovered that retailers are a good partner and a good channel for such communications. In particular, WRAP recruited a huge retail partner (the British affiliate of Walmart, Asda) willing to put labels and signage on clothes and throughout stores to encourage washing for longevity.
- WRAP implements a statistically significant quarterly survey to monitor “stated behavior”, estimate levels of campaign awareness/recognition, and inquire about what people do with their clothing (e.g., donate, dispose, store in closet).
- WRAP’s programs demonstrate how the organization has chosen to go down the behavioral path rather than the demographic (market segment) path; targeted behaviors cross cut demographics. A program can address a specific behavior and still reach multiple

¹⁷ For example, findings suggest some sub-groups are more likely than others to keep their clothes in active use for longer, such as “men, older people, people on low incomes, people in higher social grades,” and a few other categories.

¹⁸ By way of example, one key finding states, “active use of clothing is an average 3.3 years across all types of clothing measured in the survey, across six different purposes for wearing.”

¹⁹ As defined in WRAP’s “[Sustainable Clothing: A Practical Guide to Enhancing Clothing Durability and Performance](#),” Physical durability is: Garment design and construction to create products that can resist damage and wear. For a knitwear garment, for example, physical durability might be determined by the degree of pilling which occurs over time; for socks, the gauge may be color fading. Emotional durability is: Garment design that takes into account relevance and desirability to the consumer—does it still fit, or is it no longer to their taste?

²⁰ Links to the complete media campaign are available within the WRAP Resource Library [here](#).

demographics, however, targeting a demographic risks the effort not reaching a broad segment of people engaged in a targeted behavior.

- For waste prevention opportunities on the *production* side, WRAP data suggests the single biggest intervention one can make is in material selection. The fiber type from which a piece of clothing is made has enormous influence on the product's lifecycle impacts.

The [North London Waste Authority](#) and behavior-change NGO [Hubbub](#) are encouraging people to upcycle their wardrobes by 're-fashioning' their clothes or swapping something they no longer want. Articles [here and here](#).

[European Clothing Action Plan](#) (ECAP) – Funded by EU Life, which financially supports environmental, nature conservation, and climate action projects in the European Union, the ECAP has multiple objectives related to clothing, one being to “[i]nfluence consumers to buy smarter and use clothing for longer by using the existing *Love Your Clothes* consumer campaign.” The *Love Your Clothes* campaign was developed by WRAP (see above).

Denmark's [2015 Waste Prevention Strategy](#) includes a chapter entitled, *Clothing and textiles – sustainable fashion is the way forward*, in which the Government prioritizes an initiative: “A partnership to ‘prolong the life span of your clothes’ will establish voluntary and binding collaboration between all players in the clothing value chain, relevant authorities, and stakeholder organisations. The partnership will identify barriers and common solutions, e.g., return systems, deposit schemes, and it will focus on textile materials, including wool, cotton, and polyester. Funding has been earmarked for nudging campaigns, demonstration projects, and other specific solutions under the partnership.” (No updates to this plan have been identified.)

Academia

Samira Iran Interview Highlights

Interviewee: Samira Iran (a PhD candidate at Technische Universität Berlin and research assistant at Ulm University in Germany working on sustainable transformation of the textile industry)

- One of Iran's primary research questions revolves around who are the consumers of fast fashion and who are the consumers of secondhand clothing. The research explores the motives behind clothing reuse and what attitudes lead to people accepting or rejecting “collaborative” fashion (e.g., sharing economy) approaches. She is currently analyzing her data, but suspects that cultural factors play a very important role in shaping attitudes and behavior, even on a local level.
- Vis-à-vis the importance of cultural factors, Samira recommends that program developers look closely at specific geographic areas to identify the relative presence of preferences and comfort levels with clothing reuse, sharing, and swapping.
- Germany currently has two on-line clothing libraries. (There are many such enterprises in the Nordic countries.) Such libraries tend to let participants have four to five pieces of clothing at a time, with a monthly subscription fee. Iran does not feel she has sufficient information to

determine whether the library model generally increases or decreases total clothing use of the participants.

- Iran referenced pilots with high school aged students where kids are encouraged to bring in all of their own clothes they no longer wear. The kids are then allowed to select three or four other items for their own use for a limited period of time. Some of these programs also teach students how to repair and maintain their clothes.
- Iran noted that behavior-change messaging depends on the specific audience. In working with schools, swapping parties will likely resonate more with the students and draw greater engagement insofar as they allow socializing and creativity through upcycling, etc. Among adults, messages about repair and thrift will likely resonate more.

IN SUMMARY

The objectives for this report focused on defining *who* is involved in clothing waste prevention, *what* and *how* are they engaging consumers, and finally, *what* were the results of these actions. The following is a high level summary of findings:

Who is involved in clothing waste prevention?

This arena is still in the beginning phases of development, but our research showed that there is an active cross section of brands and other businesses, governments, and nonprofits dedicating staff and resources to develop solutions.

What are the current players doing to address prevention?

- Encouraging consumers to buy only what clothing they need (though this is not a prevalent message)
- Increasing consumer awareness of and preference for durable clothing
- Encouraging consumers to extend clothing life through:
 - Care practices
 - Repairing items themselves
 - Repairing items via clothing brands' program or independent repair/renew businesses
- Incentivizing consumers to trade-in or swap used garments
- Renting instead of purchasing clothing (questions remain whether this prevents or increases waste)

How are consumers being engaged with prevention?

- Online information to take action:
 - choosing durable clothes
 - caring for clothes to make them last longer
 - making basic repairs
 - participating in take-back collections
 - offering rental/leasing programs
 - making use of brands' repair offers
 - purchasing one-of-a-kind re-fashioned items
- Events

- Small “pop-up” repairs and refashioning
- Larger-scale used clothing swaps, donations, repairs, and refashioning expos
- Campaign examples
 - [Love Your Clothes](#)
 - [“Don’t Buy This Shirt Unless You Need It”](#)

What have these clothing waste prevention pioneers learned?

Consumers respond to clothing take-back programs as evidenced by Eileen Fisher’s 800,000 used items collected since 2009 and Patagonia’s 40,000 repairs per year. However, these two leaders are still developing sufficient capacity to turn the “damaged beyond repair” items into upcycled products.

Clothing repair and renewal businesses may represent an opportunity to increase waste prevention and economic growth in the Seattle-King County area. However, repair industries in general, are in decline. Oregon DEQ noted these challenges to keep in mind²¹:

- Lack of information or knowledge
- Lack of access to skills or tools
- Insufficient infrastructure
- Consumption patterns that devalue reuse and repair
- Cost

While there is a lack of skilled sewing labor (likely resulting from industrial production moving offshore), there is interest by government (Oregon DEQ), businesses, and nonprofits to change this.

Programs that extend clothing life have strategic value for brands and seem to be an effective behavior change tool:

- Patagonia shares customer stories of how long they’ve kept various Patagonia items, showing emotional connections and perhaps brand loyalty.
- Eileen Fisher recognizes that by selling used Fisher-brand clothes, more customers can afford this high-end brand and the repurposing of clothes may hook a younger consumer.²²
- WRAP’s most extensive consumer-based campaign, “Love Your Clothes”, is built on the premise that consumers have an emotional connection to their clothes and there are positive ways to keep these clothes in use longer.

What have been the results of this work and how are these results being measured?

Current results by NGOs and governmental entities lie more in consumer research, development of campaigns and engagement tools, and initial funding of specific strategies such as repair cafes vs measurable results in waste prevention.

NGO and government programs did not provide metrics on results – either because it was too early, metrics in prevention are inherently challenging, or results had not been tracked.

²¹ Background Paper: Reuse, Repair and Product Lifespan Extension, Oregon DEQ, June 6, 2016; p. 33.

²² Sustainable Brands: “Trending: Improved Resource Efficiency Signals Major Win for Circularity in Fashion, Carpet, Steel.” Libby MacCarthy, December 11, 2017:

http://www.sustainablebrands.com/news_and_views/waste_not/libby_maccarthy/trending_improved_resource_efficiency_signals_major_win_cir.

Appendix One: Studies and Reports

Alimen, N. (2014). The analysis of fast fashion consumption: What drives consumers to buy fast fashion products? Presented at the 2014 Global Fashion Management Conference, London, UK.

https://www.academia.edu/10775561/The_Analysis_of_Fast_Fashion_Consumption_Behaviour_What_Drives_Consumers_to_Buy_Fast_Fashion_Products

Armstrong, C. M., Niinimäki, K., Kujala, S., Karell, E., & Lang, C. (2015). Sustainable product-service systems for clothing: Exploring consumer perceptions of consumption alternatives in Finland. *Journal of Cleaner Production*, 97, 30-39.

<http://www.sciencedirect.com/science/article/pii/S0959652614000596>

Guiot, D. & Roux, D. (2010). A second-hand shoppers' motivation scale: Antecedents, consequences, and implications for retailers. *Journal of Retailing*, 86(4), 383-399.

<http://isiarticles.com/bundles/Article/pre/pdf/4947.pdf>

Helm Stephens, S. (1985). Attitudes toward socially responsible consumption: Development and validation of a scale and investigation of relationships to clothing acquisition and discard behaviors. PhD dissertation for the Virginia Polytechnic Institute and State University.

<https://vtechworks.lib.vt.edu/handle/10919/49876>

Iran, Samia. Iran's work is highlighted in the [SCORAI March 2017](#) newsletter. [Samira is a PhD candidate at Technische Universität Berlin](#) and holds a position as a research assistant at Ulm University in Germany. She is working on a project on sustainable transformation of the textile industry. Her research focuses on the topic of sustainable fashion consumption since 2012. She is currently investigating the sharing economy and collaborative fashion consumption using quantitative research methods.²³

Joung, H. & Park-Poaps, H. (2011). Factors motivating and influencing clothing disposal behaviours. *International Journal of Consumer Studies*, 37, 105-111.

https://www.researchgate.net/publication/263251853_Factors_motivating_and_influencing_clothing_disposal_behaviors

Joung, H. (2013). Materialism and clothing post-purchase behaviors. *Journal of Consumer Marketing*, 30(6), 530-537.

<http://www.emeraldinsight.com/doi/pdfplus/10.1108/JCM-08-2013-0666>

Joy, A., Sherry, J. F., Venkatesh, A., Wang, J., & Chan, R. (2012). Fast fashion, sustainability, and the ethical appeal of luxury brands. *Fashion Theory*, 16(3), 273-296.

<https://www3.nd.edu/~jsherry/pdf/2012/FastFashionSustainability.pdf>

Kirchain, Randolph, Olivetti, Elsa, Miller, T Reed and Greene, Suzanne. (2015). Sustainable Apparel Materials: An overview of what we know and what could be done about the impact of four major apparel materials: Cotton, Polyester, Leather, & Rubber. Materials Systems Laboratory, MIT, Cambridge, MA.

<http://msl.mit.edu/publications/SustainableApparelMaterials.pdf>

Laitala, K. & Boks, C. (2012). Sustainable clothing design: Use matters. *Journal of Design Research*, 10, 121-139.

<http://www.inderscienceonline.com/doi/abs/10.1504/JDR.2012.046142>

²³ Iran's quantitative research is being written up now and should be in her completed dissertation by the end of 2017. She is also currently awaiting the publication of three papers. She can share them in a few months once they have all come out in journals. One paper explores theories and definitions of collaborative consumption. A second paper looks at qualitative reasons people engage in clothing reuse and second hand purchasing, and reasons people reject such options. For example, does it have to do with altruism? Eco-consciousness? A third paper looks closely at sewing cafes.

Lang, C., Armstrong, C. M., & Brannon, L. A. (2013). Drivers of clothing disposal in the US: An exploration of the role of personal attributes and behaviours in frequent disposal. *International Journal of Consumer Studies*, 37, 706-714.

https://www.researchgate.net/publication/259549951_Drivers_of_clothing_disposal_in_the_US_An_exploration_of_the_role_of_personal_attributes_and_behaviours_in_frequent_disposal

Langley, E., Durkacz, S., & Tanase, S. (2013). Clothing longevity and measuring active use. WRAP report.

http://www.wrap.org.uk/sites/files/wrap/priv_download/Clothing%20longevity%20SUMMARY%20REPORT.pdf

Minnesota Pollution Control Agency: A Study of the Economic Activity of Minnesota's Reuse, Repair and Rental sectors. 2011, available via management.analysis@state.mn.us or 156-259-3800. (Clothing is mentioned, but not in the context of repair.)

<https://www.pca.state.mn.us/sites/default/files/p-rrr1-02.pdf>

Myers, G. J. (2014). Designing and selling recycled fashion: Acceptance of upcycled secondhand clothes by female consumers, age 25 to 65. Master's thesis for North Dakota State University of Agricultural and Applied Science.

https://library.ndsu.edu/ir/bitstream/handle/10365/23189/Meyers_Designing%20and%20Selling%20Recycled%20Fashion.pdf?sequence=1

Niinimäki, K. & Hassi, L. (2011). Emerging design strategies in sustainable production and consumption of textiles and clothing. *Journal of Cleaner Production*, 19, 1876-1883.

<http://www.sciencedirect.com/science/article/pii/S0959652611001569>

Oregon DEQ (2016). Background paper: Reuse, repair and product lifespan extension.

<http://www.oregon.gov/deq/mm/Pages/Product-Lifespan-Extension.aspx>

Perez, Iana, Martinis, Suzana. Solid waste prevention methods for the sector of clothing and fashion. Scientific Initiation Colleger, Universidade Estadual de Londrina.

http://www.academia.edu/3068690/SOLID_WASTE_PREVENTION_METHODS_FOR_THE_SECTOR_OF_CLOTHING_AND_FASHION

Roy, S. & Goswami, P. (2007). Structural equation modeling of value-psychographic trait-clothing purchase behavior: A study on the urban college-goers of India. *Young Consumers*, 8(2), 269-277.

<http://www.emeraldinsight.com/doi/abs/10.1108/17473610710838626>

Shim, S. (1995). Environmentalism and consumers' clothing disposal patterns: An exploratory study. *Clothing and Textiles Research Journal*, 13(1), 38-48.

<http://journals.sagepub.com/doi/abs/10.1177/0887302X9501300105>

Stevenson, A. & Gmitrowicz, E. (2013). Study into consumer second-hand shopping behaviour to identify the re-use displacement effect. WRAP report.

<http://www.wrap.org.uk/sites/files/wrap/Reuse%20displacement%20report%20executive%20summary%20v2.pdf>

ThredUP (2017). ThredUP annual resale report. (Useful market and demographic information, however given its emphasis on purchasing second hand clothing it has narrow applicability for broader waste prevention activities. One useful section is: Resale Consumers Choose Access Over Ownership.)

https://cf-assets-tup.thredup.com/resale_report/2017/thredUP_resaleReport2017.pdf

Tojo, N., Kogg, B., Kiorboe, N., Kjaer, B., & Aalto, K. (2012). Stakeholder's initiatives and views on textile waste prevention and recycling. *From Prevention of Textile Waste*.

<https://www.crossref.org/iPage?doi=10.6027%2FTN2012-545>

University of Delaware, Department of Fashion & Apparel Studies. Faculty in the Department of Fashion & Apparel Studies conduct empirical research, develop theory, carry out creative design scholarship aimed at demonstrating new techniques or ways of creation and engage with the industry and other stakeholders to translate research findings to practice. Overview of research projects available at:

<https://www.fashion.udel.edu/research-and-outreach/research-projects>

Weber, S., Lynes, J., & Young, S. B. (2016). Fashion interest as a driver for consumer textile waste management: Reuse, recycle or disposal. *International Journal of Consumer Studies*, 41, 207-2015.

<http://onlinelibrary.wiley.com/doi/10.1111/ijcs.12328/full>

WRAP UK, *Clothing Longevity and Measuring Active Use*; August, 2013. Available via www.wrap.org.uk.

WRAP UK, *Consumer Clothing Survey*; 2016. Available at: <http://www.wrap.org.uk/sustainable-textiles/scap/report/consumer-clothing-survey> .

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WRAP UK, *Sustainable Clothing: A Practical Guide to Enhancing Clothing Durability and Performance*; July, 2015. Available via www.wrap.org.uk.

WRAP UK, *Sustainable Clothing Action Plan (SCAP)*. Available at <http://www.wrap.org.uk/sustainable-textiles/SCAP>.

WRAP UK, *Valuing Our Clothes: The Cost of UK Fashion*; July, 2017. Available at: <http://www.wrap.org.uk/sustainable-textiles/valuing-our-clothes%20> .

Yinyin Wang, T. (2010). Consumer behavior characteristics in fast fashion. Master's thesis for the University of Borås, Sweden.

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