

City of Philadelphia Office of Sustainability

2021

Zero Waste Guide *for designers*

*A guide for clothing and textile designers to learn about
sustainable design strategies and textile management*

*"We are having a renaissance
of individuals who are doing
things that they believe in."*

JORDAN HADDAD

CEO of Lobo Mau

What is Zero Waste Fashion?

The existing system of fashion is unsustainable by design. It is estimated that 100 billion garments are produced worldwide and people buy 20 billion pieces of clothing annually in the United States (equivalent to 68 pieces per person each year). The Environmental Protection Agency estimates that 26 million pounds of textile waste per year are thrown away which makes up 6% of total waste in landfills—and 95% of this textile waste could be reused or recycled.

Zero waste fashion can vary in definition from designer to designer. But overall, its definition encompasses a design technique that is focused on eliminating waste from clothing production. Designers can make waste-reducing choices in both the pre-consumer and post-consumer life cycle of clothing.

This idea of zero waste fashion is not new. Many traditional garments, such as the Japanese kimono and Indian sari, were designed with these values in mind since textiles were a more precious commodity before industrialized manufacturing.

Designers can contribute meaningfully to reducing textile waste and create beautiful, durable garments that contribute to a more sustainable fashion industry by adopting zero waste practices. A priority should be placed first on reducing pre-consumer textile waste, which conserves resources and is more cost-effective. The scraps are best dealt with using diversion techniques that prevent the fabric from going into the landfill.

Lastly, other sustainable choices can be made in the fashion design process that are not necessarily related to waste but make products more ethical and sustainable. This guide will go into depth about the first steps towards becoming a zero waste designer, good practices for design, and advice from established six Philadelphia zero waste & sustainable designers and companies including Lobo Mau, Kitchen Garden Textiles, West Oak Design, The Big Favorite, Steel Pony, and Alice Alexander.

Why Pursue Zero Waste Fashion?

Hear from some Philadelphia Zero Waste Designers about why they chose to pursue Zero Waste and sustainable design:



“

Waste is big in clothing and we don't want to be a contributor. Starting out in sustainability is a big undertaking and tackling waste is what we started with.

LOBO MAU

Nicole and Jordan Haddad

“

For one, it is an altruistic endeavor to want to reduce waste in general. But it is also a satisfying design challenge to minimize waste and make the designs beautiful.

KITCHEN GARDEN TEXTILES

Heidi Barr



“

I am a nature lover: I love hiking, camping, and gardening. The respect and gratitude I have for nature drives me to do everything in my power to preserve it.

WEST OAK DESIGN

Christie Sommers



“

I realized that small choices make a big impact. I founded The Big Favorite to make processes with the planet and consumer in mind.

THE BIG FAVORITE

Eleanor Turner



Philadelphia Zero Waste Partnership Program

The Philadelphia Zero Waste Partnership Program is a collaboration between the City and local businesses to achieve Zero Waste in Philadelphia. As Zero Waste Partners, designers get the opportunity to earn incentives for implementing Zero Waste practices. Some of the benefits include becoming eligible for Philadelphia's Sustainable Business Tax Credit, a public listing on the City's directory of Zero Waste Partners, and gaining marketing materials, tools, and tips to help you strengthen your presence as a leader in Zero Waste. And most of all, this partnership shows customers that the business is committed to making Philadelphia a cleaner and more sustainable city.

Depending on what actions designers decide to complete, they can earn the status of partner, silver, or gold. Partners report on zero waste actions (ex: donating excess stock) and their waste diversion rate (amount of waste that they redirected from the landfill through reuse or recycling).

Any business or organization in the City of Philadelphia can become a partner by following these three steps:

1. Submit the Commercial Waste Report Form annually at commercialwaste.phila.gov
2. Report the property's waste diversion rate and complete zero waste actions with the zero waste partnership form monthly, also at commercialwaste.phila.gov
3. Complete and Maintain Zero Waste Action Item #1 (comply with Philadelphia's recycling ordinances)

Contact sustainability@phila.gov to learn more & join the partnership!

CURRENT ZERO WASTE PARTNERS

“ Gaining the zero waste certification holds us accountable and forces us to continuously push ourselves into the next realm.

LOBO MAU

610-764-9035

lobomau.com

“ It's useful to feel a part of something larger. I get access to information and it's even helpful to get moral support.

KITCHEN GARDEN TEXTILES

267-209-0826

kitchengardentextiles.com

FOR MORE INFO ABOUT:

ZERO WASTE PARTNERSHIP

phila.gov/programs/zero-waste-initiatives/zero-waste-partnership

SUSTAINABLE BUSINESS TAX CREDIT

phila.gov/services/payments-assistance-taxes/tax-credits/sustainable-business-tax-credit

Key Zero Waste Fashion Terms

Closed-Loop Design: To design with a method where clothing and its materials continue to circulate within the production system by recycling and reusing resources to create new products

Cradle to cradle: The intentional design and production of products that allows them to be recycled and/or biodegrade naturally in the environment at the end of their life

Life cycle: The process of a product moving from design to introduction into markets to usage and finally to its disposal/reuse

Pre-consumer waste: Waste that occurs during the design and manufacturing process, before the product reaches the consumer

Post-consumer waste: Waste that occurs after the consumer has disposed of a product (or its packaging) that they bought

Supply chain: The steps and resources that are involved in the pre-consumer phase, from production to transportation of a product

Recycling: The process of remanufacturing a product into a new usable product or material that is of similar quality and/or functionality to the original; an environmentally preferable alternative to landfilling or incinerating waste

Upcycling: The process of recycling where a product is transformed into a new product or material that is similar or even higher in quality and/or functionality than the original

Downcycling: The process of recycling where a product is made into a new product or material that is lower in quality and/or functionality than the original, such as insulation or furniture stuffing

Microplastics: Small pieces of plastics that are harmful to oceans and marine life that can result from washing synthetic fabrics; these plastics end up in the digestive tract of aquatic species, some of which humans consume, which impacts both marine animal and human health

Sustainable fashion: Garments that are created with environmental and social impacts in mind throughout their lifecycle

Sustainable textiles: Textiles that have a minimal environmental impact using natural or recycled fibers whenever possible

Textile waste: Leftover fabrics, scraps, yarns, and fibers that are not used in the production of other garments



Pre-Consumer Design

*Ways to prevent waste that occurs during
the design and manufacturing process*

1. Designing with Zero Waste in Mind

When it comes to the design process, there are many things that designers can focus on, whether that be minimal waste from pattern cutouts or the types of textiles used. One way designers can achieve zero waste goals is to start by choosing a focus area to perfect, and then expand into other realms of sustainable design.

A technique that has worked for Nicole and Jordan Haddad from Lobo Mau is creating many designs with zero waste in mind, and then narrowing down those options to what is economically feasible and scalable. They focus on timeless silhouettes and reinvent them by designing new textile prints. This system works well for Lobo Mau and they urge other designers to find what system works for them.

Pattern Cutouts

One aspect of design to consider is fully utilizing the yardage when cutting patterns for a garment, leaving the least amount of scraps. This step must be done in conjunction with the garment design as an iterative process.

To do this, determine what pieces are needed for the garment, and then arrange the pattern like a jigsaw. Also, consider using different shapes and styles to eliminate waste in pattern cutting. For example, draping is a technique that can be used to utilize the entire rectangular piece of fabric with no cutting or sewing involved. Heidi Barr, Founder and Designer of Kitchen Garden Textiles, uses creative pattern layouts to reduce waste from her apron design that has many odd cutouts. She lays out two types of towels and a reusable linen tea bag in the odd spaces to use over 90% of the yardage.

There are many benefits of zero waste pattern cutting. When patterns are placed flush against one another, one cut results in two pattern pieces which can greatly decrease the time needed to cut out garments. Additionally, the cost of fabric waste management is reduced or eliminated and the whole cost of the original fabric is used. For example, Christie Sommers, Founder and Designer of West Oak Design, designs her garment patterns by utilizing as many straight cuts as possible. Tops and dresses are simple boxy styles constructed with carefully selected fabrics that drape beautifully.

This being said, there are many issues that arise when designing Zero Waste patterns. Designing will take many iterations and visualizing the 2-dimensional cutouts into a 3-dimensional structure can be difficult. A method that could be used in the pattern cutting stage is to use a pattern digitizer once patterns are finalized to make computer-generated cutting layouts. This technique is what Alice Alexander uses to leave less than 5% of fabric waste behind. It is important to keep an open and creative mind when approaching zero waste pattern cutting.

Textile Selection

There are many types of fabrics and dyes that designers can choose from when creating a garment. Each fabric and dye will have a tradeoff related to sustainability that must be considered. For example, certain dyes will eventually harm waterways, so it is important to consider low-impact dyes that are safer for the environment. Some advice that Joanne Litz, Founder and CEO of Steel Pony, says is to focus on natural fibers to have less impact on the environment.

Below is a brief overview of some categories of fabrics. Note that this is not an exhaustive list and there are innovative and unconventional sustainable fibers not included.

Natural Textiles Fibers:

- Organic cotton is grown using more sustainable practices than standard cotton, using little to no pesticides or chemicals. Check that the cotton is GOTS-certified to ensure high-quality cotton. If sourcing from smaller farms, they may not have the resources to be certified organic but may be using organic farming practices. It is important to talk to the people along your supply chain for full understanding.
- Recycled/upcycled cotton is made from post-industrial and post-consumer cotton waste.
- Organic hemp is widely grown with little water, no pesticides, and naturally fertilizes the soil. It produces 2 times the amount of fiber per acre than cotton.
- Organic linen is derived from the flax plant which requires minimal water and pesticides. It is biodegradable when untreated.

Synthetic (Man-Made) Fibers:

- Recycled polyester is made from recycled plastic bottles which generate 54% less carbon dioxide emissions and require 70% less energy than producing virgin polyester. However, it is also important to also consider that even recycled fibers, when washed, release microplastics into waterways.
- Recycled nylon is mainly made from old fishing nets, carpets, and tents. It also diverts waste from landfills and requires less energy than its virgin counterpart.

Other:

- Deadstock fabric is the leftover fabric that is unsold by fabric mills or a brand's production run, which can come in a variety of fibers.

Fabric Scrap Design

Designers should consider using the extra scraps leftover from pattern cutting in other designs. Consider using remnant fabric (scraps) to create smaller parts of another piece such as a strap or a pocket or weaving together scraps to create new fabric pieces. Kitchen Garden Textiles, for example, utilizes scraps to make a quilted textile to be used as a picnic blanket or table cloth. On the other hand, West Oak Design uses fabric scraps to become details in one-of-a-kind bags with the smallest scraps sewn into a zero-waste coil rope collection.



“Live with your remnants. Keep them as a resource that you are challenged to work with. Be patient and creative.

KITCHEN GARDEN TEXTILES

267-209-0826 | kitchengardentextiles.com

“My advice for designers is to start with what fuels you and what you are passionate about in sustainability. Focus on that and build on it.

LOBO MAU

610-764-9035 | lobomau.com

2. Sustainable Production

Sustainable production can mean a variety of things depending on the designer's values. This aspect of the pre-consumer garment life cycle includes manufacturing waste management practices and social responsibilities.

One choice that designers might make is to adopt a made-to-order business model. In this option, the designer does not invest in garment inventory and instead creates garments on an as-ordered basis.

If designers do not want to pursue this model, it is still important to be mindful of overproducing. Alice Alexander, for example, found that the small-batch manufacturing model works best for their company and allows them to avoid overproduction. If a garment sells quickly, consider keeping a garment for multiple seasons to allow additional ordering from factory partners.

Another consideration is partnering with local factories and manufacturers to lower the carbon footprint of the garment and to have greater

control over the manufacturing processes. To find suppliers, it is useful to be tied into the Philadelphia designer community and refer to local schools and universities. After identifying local factories and mills to work with, learn about their sustainability practices to find the organization that best suits your sustainability and zero-waste values. Alice Alexander also incorporates this into their business by researching each factory to see if they are a social enterprise, worker-owned, hold any certifications (Guaranteed Fair Trade, SA800, etc.), or state that they hold ethical work practices. In early 2022, there will be a live map of local supply chain resources on alltogethernowpa.org.

Often overlooked but still critical to textile sustainability is the ethics of the labor practices employed throughout your supply chain; it is important to ensure that factory workers are provided living wages and clean and safe working conditions. To do so, it is important to ask questions of suppliers to gain a full understanding and have complete transparency.

3. Packaging & Transportation

When packaging the final product, one aspect to consider is the labels and tags used on the item. There are three things to consider when selecting tags: (1) the material, (2) the printing process, and (3) the attachment. Some zero waste tags can be made of recycled paper, like khadi paper, recycled cotton scraps, leftover fabric scraps, or reused paper.

When printing these tags, consider using ink made from soot and block print paper, resulting in fewer carbon emissions and waste. Lastly, consider attaching the tags with something a consumer can reuse such as a cord or safety pin. Another option is to upcycle factory straps!

As garments are shipped to customers, pay attention to the waste that is generated from packaging. The most traditional form of packaging is polybags, which help keep out dirt and prevent mold. However, these result in a lot of plastic waste. Designers can ask themselves if this type of protection will be necessary. *How likely is it that a garment will mold on its short journey? Will water damage a washable item?* And find more sustainable solutions.

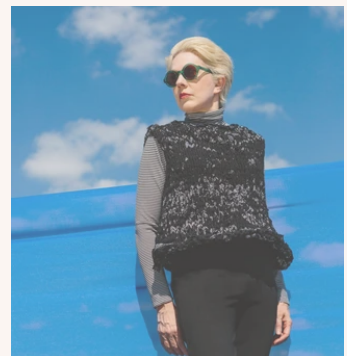
First, consider paper packaging which is a sustainable option that is also lightweight and strong. Some alternatives include cardboard, boxboard, paper bags, and reusable shipping sacks. Another, less favorable option is to consider plastic-free packaging or pursue alternatives such as recycled or plant-based plastics. Some examples are bio-based LDPE polybags or recycled polybags. Additionally, there are some compostable packaging options available for smaller-scale shipments. Other aspects to think about are sustainable alternatives for packaging tape and packing peanuts. And of course, extend your creativity in design to your packaging and consider options that consumers can reuse or upcycle themselves!

Curating a local customer base will also reduce greenhouse gas emissions that are produced from transportation.

ZERO WASTE DESIGN

Lobo Mau | Zero Waste Vest

Using scraps and leftover fabric from their previous designs, Lobo Mau chain-stitched together over 400 yards of fabric to make a vest. Some fabrics were frayed and some had textile prints that came together to create a one-of-a-kind vest!





Post-Consumer Management

*Ways to prevent waste that occurs after
consumers purchase and dispose of garments*

Circular Fashion Business Models

Although post-consumer management seems like a process to be considered after the sale of a garment, it is also important to think about the end of life of a product during the design phase. Making sure that a product is durable and timeless will help designers improve the lifespan of a garment and thus, extend the time it takes for a garment to reach the post-consumer management stage.

Take-back Programs

To fully close the loop of a garment's life-cycle, post-consumer actions must be considered. Consider implementing a take-back program for your garments. Some large retailers like H&M and UNIQLO allow customers to drop off any clothing, but for smaller designers, it might be more sensible to only take back older designs. To incentivize customers, economic offers such as a discount on their next purchase can be provided. Additionally, designers can create a resale section on their site and sell pre-loved garments.

Fabrics that are received upon take-back can be used in other designs. When receiving them, it is helpful to sort them by color and fiber to see what some of the design possibilities are. Think outside the box to make other products if necessary! If there is no suitable project for the fabrics, they can be sent to recyclers who donate the clothing, downcycle fabric into other products (ex: mattress fillings), or recycle polyester-based textiles into new polyester fabrics. The Big Favorite, for example, utilizes a take back program with their customers to mechanically recycle their cotton undergarments into yarn.

ZERO WASTE TIP

Sorting by color for natural textiles is also more sustainable because this avoids re-dyeing, saving energy and avoiding pollutants.



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As a zero-waste designer, it is vital to think about the end of life of your product during the design phase. This will influence the material you select and what programs you implement (buyback/repair service). It will emphasize the importance of durable, quality craftsmanship that will enable your product to be utilized for a very long time, and lastly think about the style... will it be a trend that will be tossed aside in a few months?

WEST OAK DESIGN

westoakdesign.com

Repair service

If a sold garment is ripped or broken, a customer can bring the garment back to be repaired, in an effort to extend the lifespan of the item. Christie Sommers, founder and designer of West Oak Design, repairs items from her customers to ensure that her items last forever. Alice Alexander offers a similar service where they can alter all products on their website to ensure that items fit well and consumers keep items for longer. This is a sustainable practice that also creates good customer relationships!

Lease & Rent

Lastly, designers can offer a leasing or renting option for buyers for certain designs or collections. This allows the designer to have better control over the life cycle and handling of a garment.

"Philly has an eclectic design landscape and it seems to be growing gradually every day. Some exciting things we've encountered is the growth of the #sustainablefashion movement and how many members of that movement are Philly-based."

ITOHAN ASEMOTA

Sourcing and Sustainability Manager of Alice
Alexander

Textile Waste Tools

Local Fabric Exchanges

Philadelphia Fabric Exchange

facebook.com/groups/863889040805540/

Space to get rid of unwanted fabric and receive other fabrics to avoid waste

Include fabric content, yardage, and width on posts in the group, accepts notions or trim

The Resource Exchange

theresourceexchange.org | (267) 997-0060

Diverts materials from waste and to the hands of artists and the general public

Fabrics/trim must be a minimum of one square yard pieces; select designer fabric samples with prints are accepted

Other Fabric Exchanges

Queen of Raw

queenofraw.com

Buy and sell deadstock materials through an online marketplace

Can sell trim and fabric of 3 yards or greater

Etsy

etsy.com/market/recycled_fabric_scraps

Online marketplace to buy and sell creative items

Can sell any scraps of items that others can buy and use

Lancaster Creative Reuse Center

lancastercreativereuse.org

Provides access to materials to inspire creativity, and increase access to the arts

Accepts 100% quilting weight cotton fabric (at least 1 yd), minky and flannel fabric (40" x 60" minimum), cotton batting (minimum 60" x 80"), sewing tools

ZERO WASTE TIP

Not local to Southeastern Pennsylvania? There are creative reuse centers nationwide! Search for one in your area.

Local Fabric Collectors

Retrievr

retrievr.com | partners@retrievr.com

Collects clothing, shoes, and fabrics to fiber-to-fiber recycle, reuse, and downcycle materials with doorstep and mail-in recycling programs

Fabscrap

fabscrap.org

Collects fabric scraps and fabric rolls to be fiber-to-fiber recycled, downcycled or reused

Accepts fabric rolls with headers and tags attached

National/International Fabric Recyclers

I:CO

ico-spirit.com/en/ | USA@ico-spirit.com

Fibers from clothing made into insulation and other products in various industries or respun into yarn that can be used with their partners

Accepts clothing and shoes to be sold as second-hand

Textile Recycling Quotes

textilerecyclingquotes.com |

garethrecyclingquotes.com

Shreds fabrics to be used in furniture, insulation, carpet padding

TerraCycle

terracycle.com

Collects boxes of materials to be recycled

Accepts a variety of fabric in their purchased Fabric and Clothing Zero Waste Box to be reused, upcycled, or recycled

American Textile Recycling Service

atrscorp.com

Donation bin operator to reuse, renew, and recycle clothing and shoes

More Textile Waste Tools

More National/International Fabric Recyclers

2ReWear

2rewear.com

Collects post consumer textile waste from retailers to be reused, recycled, and downcycled

Blue Jeans Go Green

bluejeansgogreen.org |

BlueJeansGoGreen@cottoninc.com

Recycles denim made from cotton into insulating material

Accepts denim scraps that have to be at least 90% cotton scraps

Green Tree

greentreetextiles.org |

info@greentreetextiles.org

Repurposes clothing and textiles to be reused by manufacturers and designers

Donate fabric at GREEN Box locations or for clothing pick-up

Trans Americas Trading Company

tranclo.com | recycle@Tranclo.com

Processes used clothing and materials for fiber recycling and secondhand clothing export

Accepts any used clothing item and household textile article

National Charities

Animal Humane Society Fabric Donations

animalhumanesociety.org

Uses fabric and fabric remnants to create pet bedding for local animal shelters

Accepts fabrics and fabric remnants, especially cozy fabrics like fleece and wool

Coffee Creek Quilters

coffeecreekquilters.org

Teaches quilting classes to incarcerated women

Accepts 100% quilting weight cotton fabric (at least 1 yd), minky and flannel fabric (40" x 60" minimum), cotton batting (minimum 60" x 80"), sewing tools

Newborns in Need

newbornsinneed.org | 412-554-0318

Sews baby blankets and quilts

Looking for fabric donations to help with work

Quilts for Caring Hands

quiltsfromcaringhands.com

Makes quilts for those who are homeless, drug addicted, visually impaired, abused or in foster care in Oregon

Accepts 100% cotton fabric in large pieces, including preprinted panels, Textured fabric – i.e. terry cloth, fleece, velour, fake fur (for tactile quilts), Cotton or 80/20 cotton/poly batting

Quilts of Valor

govf.org

Accepts 100% cotton quilting weight fabric (with preferred colors of red, white, and blue)

South Jersey Quilts of Valor

r_a_b_27@hotmail.com

Stitches of West Brandywine (Unionville, PA)

conwaykath@aol.com

Not Forgotten Quilts of Valor (West Grove, PA)

elaine.navarro-page@hotmail.com

Even More Textile Waste Tools

More National Charities

Snuggled in Hope

snuggledinhopequilts.com |

snuggledinhopequilts@outlook.com

Makes quilts and pillowcases for the campers at Flying Horse Farms in Ohio

Accept donations of 100% cotton fabric (cheerful, kid-friendly prints; no glittery fabric; no flannel, fleece, denim, or knits) and quilting supplies

The Sewing Labs

thesewinglabs.community

Teaches sewing to at-risk individuals with the hope of breaking the generational cycle of poverty and addiction in Kansas City, MO

Accept donations of clean fabric (quilting, garment, and upholstery), notions, tools, interfacing, quilt batting, and working sewing machines

Wrap them in Love Foundation

wraptheminlove.org.

Distributes quilts to children around the world through local food banks, orphanages, shelters, hospitals, and those in natural disasters

Accept donations of fabric, batting, sewing supplies, quilt tops, and finished quilts

Goodwill

goodwill.org. | Multiple locations

Buys and sells used or scrap fabrics at a discounted price

Accepts fabric donations like large pieces or quilting bundles

Salvation Army

salvationarmyusa.org. | Multiple locations

Picks up fabrics in certain locations or can be donated at certain stores

International Charities

Days for Girls

daysforgirls.org |

development@daysforgirls.org

Dedicated to providing education and menstrual supplies to girls around the world

Possibly accepts donations of fabric to create menstrual products

Serving with smiles

servingwithsmiles.org.

Coordinates monthly drive to make kits for children

Accepts donations of cotton fabric and quilt batting occasionally based on the monthly drive

Additional Resources

Philadelphia Fashion and Garment Industry Task Force

supportphillyfashion.com
pfitforce@gmail.com

Support Philly Fashion

supportphillyfashion.com

The Fashion Circular

thefashioncircular.com

City of Philadelphia Resources for Recycling and Donation

phila.gov/recycling-donation-finder/

Bureau of International Recycling (BIR)

bir.org

Philadelphia Zero Waste Partnership

phila.gov/programs/zero-waste-initiatives/zero-waste-partnership/
sustainability@phila.gov

CLO 3d (Fashion Design Software)

clo3d.com

Redress Design Award

redressdesignaward.com

BOOK RESOURCES

Cradle to Cradle: Remaking the Way We Make Things

By: Michael Braungart

Biomimicry: Innovation Inspired by Nature

By: Janine M. Benyus

Disclaimer: Reference in this guide to any specific commercial product, process, or service, or the use of any trade, firm or corporation name is for the information and convenience of readers, and does not constitute endorsement, recommendation, or favoring by the City of Philadelphia.

Please contact sustainability@phila.gov to offer feedback or additions.

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THE CITY OF PHILADELPHIA
— OFFICE OF —
SUSTAINABILITY

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