

Cotopaxi Footwear Line Development

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Thesis Capstone Research

Author Note

How can we create a sustainable line of footwear for Cotopaxi while achieving excellent performance in the outdoors?

Table of Contents

Cotopaxi Footwear Line Development..... 6

Doug Hintze Bio 6

 Clifton Strengths 6

 Golden Circle 6

 Thesis – Strengths – Career Outlook 6

 Capstone Mentorship 7

Company History and Introduction 8

User Information.....11

Product Classification 12

Problems – Jobs To Be Done 12

How Can We 13

Sports Environment 13

 First Product Launch..... 14

 Second Product Launch 14

Product Rules 14

State of the Art Competitor Products 15

 Responsibly Sourced Material Category 15

 SWOT Analysis 18

 Recycled Material Category 19

- SWOT Analysis 21
- Mono-Material Category 22
- SWOT Analysis 24
- Footwear Anatomy 25
 - Upper..... 25
 - Midsole 26
 - Outsole 26
 - Insole..... 26
- State of the Art Materials 27
 - Upper..... 27
 - Tooling 27
- State of the Art Manufacturing 28
 - Upper..... 28
 - Tooling 29
- Intellectual Property 30
- State of the Art Color and Future Trends 31
 - Current Cotopaxi Color..... 32
 - Future Color Potential..... 33
- State of the Art Graphics and Future Trends..... 33
 - Current Cotopaxi Graphics 34

Future Graphic Potential	35
State of the Art Logos and Future Trends	35
Logo	35
Wordmark.....	36
Future Logo Potential	36
Physiological Research of Hiking.....	37
Biomechanical Research of Hiking	37
Psychological Research of Sustainability	38
User and Consumer Research Methodology Plan	40
User Research Goals - Questionnaire	41
User Insights – Questionnaire.....	45
Performance Testing Plan	46
Breathability.....	46
Weight	47
Water Resistance.....	48
Bibliography	50
Figures.....	56
SECTION #2: WINTER TERM.....	70
SECTION #3: SPRING TERM.....	87

Cotopaxi Footwear Line Development

Doug Hintze Bio

Clifton Strengths

Includer – Focus – Futuristic – Developer – Positivity

Golden Circle

My golden circle is as follows: As a designer I am focused on creating inclusive opportunities and new experiences to help connect people through sustainable product. I strive to be more and more sustainable in the way I create and my overall approach to footwear design.

Why? Inclusion – There is room for all and creating that room can be helpful to all, including the planet.

How? An understanding of history, passion for innovation and focus on sustainability.

What? Innovative sustainable footwear that gives the user opportunity for new experiences while connecting them with others.

Thesis – Strengths – Career Outlook

There are many ways that my thesis topic aligns with my strengths and how my strengths will support my project. One of my greatest strengths is the ability to network and connect with others. This project is building a footwear line through the lens of Cotopaxi and I have and will continue to connect with high ranking employees of Cotopaxi to be able to get the best representation and mentorship for what the brand and brand's customers would expect out of a footwear offering. My ability to network and connect with others will change this project from being my own perspective, to actually nailing the proven perspective of Cotopaxi and it's customer base.

As someone who is futuristic, I look at my work through a view of the future of product and sustainability. Sustainability is just on the cusp of supreme importance and relevance to brands and their customers. My desire to plan forward as I design will help me to execute on footwear solutions that will not only hit on trend, but maintain relevant and create impact through their sustainable features.

Developer is also a strength of mine and looking at footwear creation and the development process, this project will be very heavy on development. Execution of bringing these designs to life will come through factory relationships, material research, materials sourcing, prototype creation and sample review. My skill in development will have this thesis come to life and help the final product be elevated in quality.

This project is going to be in-depth and will follow the skills I am developing for my career and push me to explore areas where I lack in expertise. Here is a list of key areas where this project will help buster my experience to help setup the beginning of my career in footwear: working on sustainable footwear solutions, working with overseas project partners, understanding supply chain at manufacturing facilities, material understanding, patterning and manufacturing efficiencies, depth in concept exploration, 3D and VR design concepting, following a proven company aesthetic, small/start-up business exposure and understanding. The list could continue on and on, but the items previously stated will both be vital to this project, as they are to the career goals I have as a footwear designer. As I go throughout this project I know that I will be pushed through obstacles that will influence the rest of my career.

Capstone Mentorship

Tom Berend – Creative Director – KIK Laboratory (20 + years as a footwear designer)

Past Experience: Footwear Design at Nike and Adidas

Meeting Schedule: Every other week for 30 – 60 minutes, Tom’s expertise in footwear design and building start-up footwear brands will be extremely valuable when it comes to creating compelling product that Cotopaxi would use as their own.

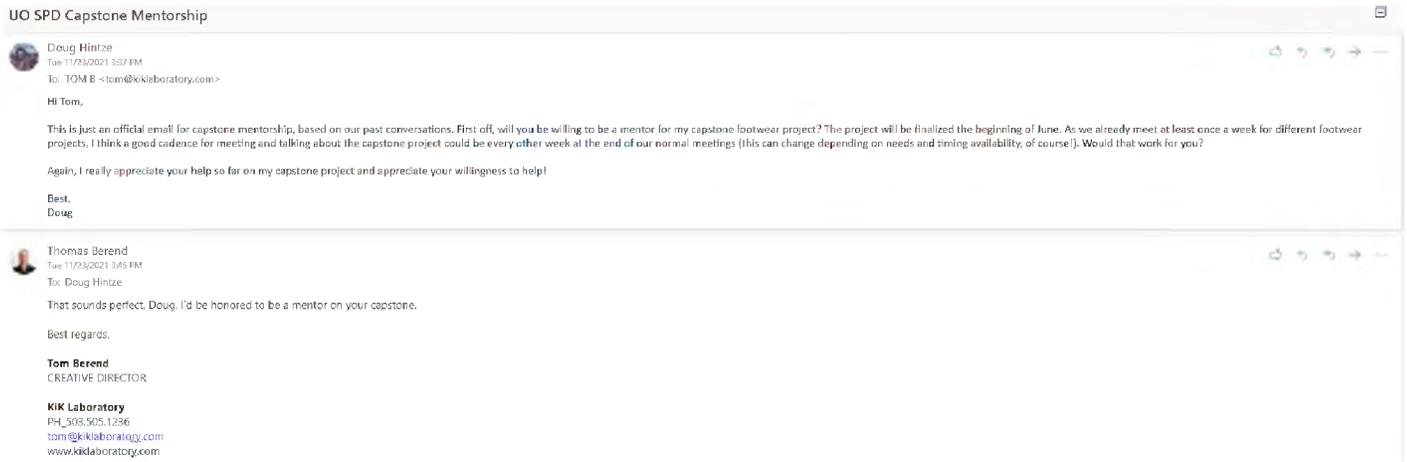


Figure 1. Display of email mentorship confirmation from Tom Berend (Berend, 2021).

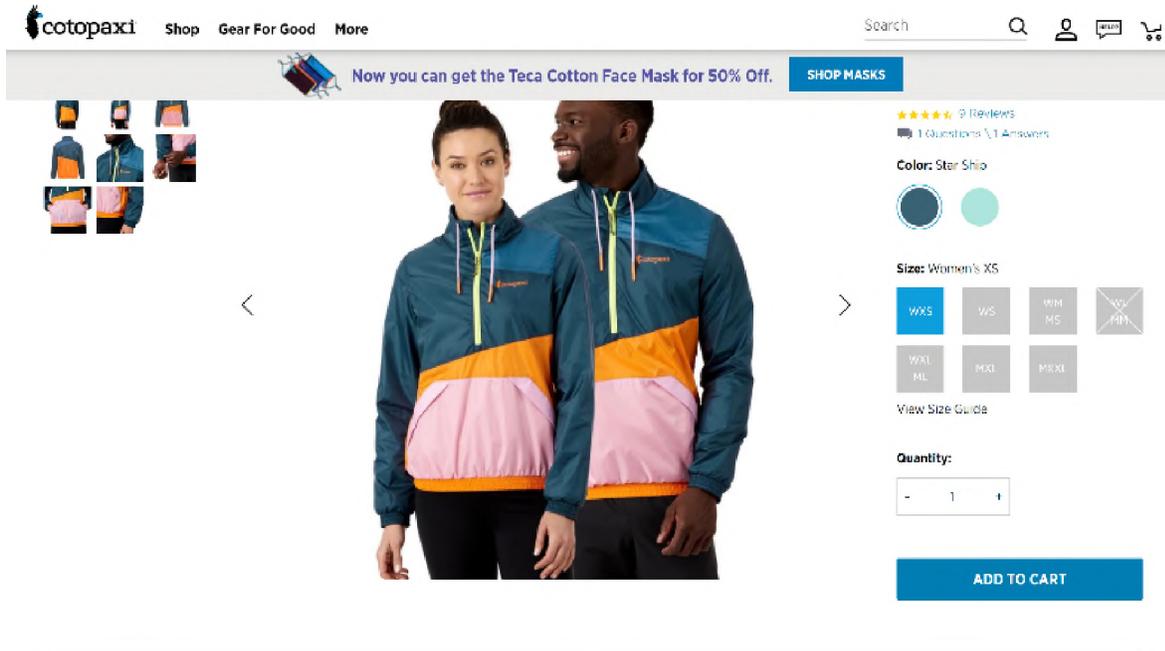
Other Project Mentors of Note: Elena Roy (Teva Footwear Designer), Seth Gerke (Teva Footwear Designer), Cori Williams (Cotopaxi Head of Product Development) and Lynn Seman (Cotopaxi Product Development).

Company History and Introduction

Cotopaxi is a certified B Corp company that aims to provide quality apparel and gear with the assurance that a portion of your purchase will go toward impacting communities of people in poverty throughout the world (Hafen, 2020). Cotopaxi’s product scope is around using remnant, recycled, and responsible material to create vibrant products to be sold to customers (*Sustainable By Design*, 2021). When the company was founded by Davis Smith in Salt Lake City, Utah in the year 2014, the main goal was to create an outdoor products company that Millennials and Gen Z could gravitate towards (Taylor, 2017).

Cotopaxi is a company in the outdoor products industry – which is a part of the market focused on providing goods and services to consumers looking to get outdoors and enjoy their time. Cotopaxi is also in a sub-category of the outdoor industry that is focused on providing consumers with products that are more sustainable - responsible materials - remnant materials - recyclable materials (*Sustainable By Design*, 2021).

Cotopaxi makes products with a purpose. On their website, under every product there is a description titled “*why it’s different*” and “*why we built this*” (*Women’s Apparel – Cotopaxi*, 2021). Customers are wanting to affiliate themselves more with brands that have a purpose and create positive connections. As they are purchasing they want to feel good about what they are getting. “The most successful companies right now are those that have figured out how to re-imagine every touchpoint a consumer has with their brand, delivering an experience-based, emotional connection. These organizations are looking past traditional ways to attract and retain



Why We Built This

Made with weather-resistant, repurposed materials, the

Why It's Different

We use 100% remnant fabric to build each Teca

Figure 2. Displays the Cotopaxi Teca Windbreaker (*Women’s Apparel – Cotopaxi*, 2021).

customers and designing compelling, personalized experiences – via advanced technologies – around products and services to better engage” (Freedman, 2019). Cotopaxi is a company that follows this philosophy and has created new ways of creating amazing customer experiences. When you buy products from Cotopaxi you are supporting a company that treats the environment well, gives back to the poor, supports refugees and is really fun.

Another key part of what makes Cotopaxi great is their transparency of supply chain (something that is increasingly important to consumers as well). In many different parts of the website, including under product descriptions, Cotopaxi talks about the factory where the product is made and the condition of the work. They are open about the need to improve the life style of factory workers and they give the workers an opportunity to help in the creative process of designing products. “Every Del Día bag is unique because we leave the color choices and final creative decisions to our sewers, who we see as integral makers” (*Bataan Factory, 2021*).



About this Factory

Location: Phnom Penh, Cambodia

Manufacturing details: The Baja Pant is produced at one of the most well-respected activewear manufacturers. Located in Cambodia, this best-in-class factory is revered for its sustainability and energy efficiency. [Learn more](#) about this factory.

Figure 3. Displays the transparency Cotopaxi shows with its factory development (*Bataan Factory, 2021*).

“Cotopaxi’s creed, Do Good, touches every aspect of our company. From our giving model to our company culture and sustainable product design, we see our business as a vehicle to make an impact. As a certified B Corporation, we put 1% of our revenue toward addressing poverty and supporting community development. Through our grant program, we promote

organizations successfully improving the human condition. To date, we've awarded 42 grants in six focus countries." (This is Cotopaxi, 2021).

To wrap it up, Cotopaxi is a company selling apparel and gear in the outdoor industry. They value sustainable products, transparent supply chain, support of the disadvantaged and outdoor adventure. They promote their products through colorful hues and exciting gear with a theme of outdoor travel, focused on the younger generations. They advertise on social media and their biggest campaign for their product and brand is the Questival.

User Information

Cotopaxi is targeted specifically to people who love adventure, fun with friends and a tighter scope on the Millennial and Gen Z groups and their friends and followers (Taylor, 2017). Basing most of the advertising on social media, they are attracting people who adventure and those who follow other's adventures. Instagram, Snapchat, TikTok and Facebook are all huge channels for advertising and even participation (Foreman, 2019).

To further define the scope of the user of Cotopaxi product, the target age demographic is 6 – 40 years old (Gen Z and Millennial age ranges). Noting that their product is non-gender specific (though sizing is in traditional male and female sizing) and is for people of all skill levels (as their product can be used in a high to low range of technical adventures). Many of these users can be classified as "New to Nature" and "City Born, Outdoor Adopted". Consumers that do not already have strong ties to longer standing companies such as L.L. Bean, Orvis, Columbia, Patagonia, The North Face or Eddie Bauer (Taylor, 2017).

This is a large and growing population in the outdoor product space and is the future of key consumers in outdoor gear. In 2019, consumer goods in the Outdoor Product industry was

2.1% of the US GDP (coming out to around \$460 billion) (*Outdoor Recreation*, 2021).

Millennials made up 38% of those purchases and that number is increasing from years past (*Source: 2014 Outdoor Consumer Segmentation*, 2016). In a recent survey completed by statista.com over 60% of the Gen Z participants participated in outdoor activity (Statista Research Department, 2021). The outdoor market for Millennial and Gen Z is very important and Cotopaxi is poised to be a key player for these consumers.

Product Classification

Footwear, Hiking, Non-Gender Specific

Style Count: 3 Styles – (Built with 3 Final Prototypes)

Cotopaxi Sustainability: 3 Styles will follow the 3 R's of Cotopaxi Sustainability – Remnant, Recycled, Responsible (*Sustainable By Design*, 2021)

Line Plan: Specific Style Dependent – 4 -20 Colorways Represented Graphically (Illustrations)

Problems – Jobs To Be Done

In this capstone project the goal will be creating a sustainable line of footwear for Cotopaxi and it's target consumer (Millennial and Gen Z), mirroring Cotopaxi's focus on repurposed material and thoughtful design, while achieving excellent performance in the outdoors.

These users are escaping a world of fast living and technology overload. A part of their escape into the wild is their participation in the Cotopaxi Questival. They need footwear they are familiar with to perform up to the standard in, what is for most, a new outdoor sport environment (Taylor, 2017). This brings a further focus on creating a line of footwear that both fits with a city living culture and performance driven outdoor community.

Key jobs to be done for this footwear will be:

- Traction for incline and descent while on the trail
- Stability for uneven surfaces
- Variable weather performance
- Support and comfort under-foot
- Fashionable/unique city aesthetic for outdoor performance

While there are no defined roles or positions when it comes to recreational hiking, these athlete's main goal is to reach new heights and have fun. If this footwear solution can fulfill the above listed jobs to be done, it will go a long way in helping them achieve their overarching goals.

How Can We

How can we create a sustainable line of footwear for Cotopaxi while achieving excellent performance in the outdoors (Traction, Weight, Water Resistance, Breathability)?

Sports Environment

Though this product will be used on a global scale, a specific focus on three areas in the United States will guide the design of the shoes and the way they are released. Those locations will be Moab, Utah and Seattle, Washington. The launch of these shoes will be at Questival events held at these three locations. The "Questival is a 24-hour adventure race that invites people to build friendships, push themselves, experience their surroundings, and have fun. Beginning with just two locations in 2014, Questivals have now spread to more than 60 cities around the country" (*Questival User Experience Audit, 2017*). As these cities are focal points to the Cotopaxi brand and areas where they already have footprint due to their own retail presence, they will be the focus of these events.

First Product Launch

Location: Moab, Utah

Target Season(s): Early Fall Season (Late August – September / Low moisture months – limited chance of rain)

Trail Environment: Rock – Sand – Trail

Temperature: 54 – 88 Degrees F - Low Humidity (less than 10%) (*Moab, UT Monthly Weather Forecast, 2021*)

Second Product Launch

Location: Seattle, Washington

Target Season(s): Early Fall Season (Late August – September / Entry to moisture months – chance of rain)

Trail Environment: Trail to street, mud, rain

Temperature: 52 – 69 Degrees F - Moderate Humidity (more than 10%) (*Seattle, WA Monthly Weather Forecast, 2021*)

Product Rules

Though there are no rules to participation for product usage in recreational hiking, there are guidelines the Cotopaxi as a company follows and principles that are in the DNA of all of the products they create.

“Cotopaxi’s creed, Do Good, touches every aspect of our company. From our giving model to our company culture and sustainable product design, we see our business as a vehicle to make an impact. As a certified B Corporation, we put 1% of our revenue toward addressing poverty and supporting community development. Through our grant program, we promote

organizations successfully improving the human condition. To date, we've awarded 42 grants in six focus countries." (*This is Cotopaxi*, 2021).

The new Cotopaxi footwear line will maintain the same principles as past, current and future Cotopaxi product, following the creed "Do Good".

State of the Art Competitor Products

In this section sustainably made footwear will be the focus of competitor analysis. There are numerous examples in the footwear industry of companies attempting different approaches to create footwear that are more eco-friendly and for the purpose of this thesis 3 specific categories of sustainable footwear will be in focus: Responsibly Source Shoes (high end virgin material that is ethically sourced and made of renewable resources) (Bell, 2021), Recycled Material Shoes (shoes made of non-virgin recycled polymers, giving plastics a second life) (Cowley, 2021), and Mono-Material Shoes (shoes made of a single material or single material category, making them easier to breakdown and recycle to be remade) (*Index. 01: Your Questions Answered*, 2021). These three categories are some of the most prevalent ways of creating sustainable footwear that we have to date. As Cotopaxi is looking to build out a footwear line, this is a great start at understanding different approaches that companies are taking and where they might best fit as new comers to the product space.

Responsibly Sourced Material Category

Category Overview: Shoes made of high end virgin material that is ethically sourced and made of renewable resources. There are many companies with products that fit in this category, to name a few: Allbirds, Veja, Cariuma, Saola, Kengos, Giesswein, Bloom and many more (Team, 2021).

In this category Allbirds has been selected for a deeper dive into it's features and benefits.

Brand: Allbirds

Name: Wool Runner Mizzles

Price Point: \$115



Figure 4. Displays example of responsibly sourced Allbirds Wool Runner Mizzle (*Allbirds Men's Wool Runne Mizzle, 2021*).

Features/Benefits:

- Wool upper for soft/durable fit and odor resistance
- Sugarcane midsole for improved comfort and under foot stability
- Machine washable for long lasting style
- Puddle Guard biobased shield for dry and breathable ride
- Flexibly conforms to foot for personalized comfort feel (*Allbirds Men's Wool*

Runner Mizzles, 2021)

Sustainable Materials Used:

- Merino Wool Upper
- Sugarcane Midsole
- Castor Bean Insole
- Biobased Upper Water Repellant
- Recycled Polyester Laces (*Allbirds Men's Wool Runner Mizzles*, 2021)

SWOT Analysis



	STRENGTH	WEAKNESS	OPPORTUNITY	THREAT
 <p>Allbirds Wool Runner Responsible</p> <p>PERFORMANCE</p>	<p>Upper: Moisture wicking, odour protectant, soft comfort feel/hand, water resistant</p>	<p>Lack of breathability, shape and form</p>	<p>Could engineered knit for help with breathability?</p>	<p>Losing sight of what makes the upper great, simplicity</p>
	<p>Insole: Antimicrobial, Moisture wicking Soft</p>	<p>Lacks overall support and has neutral shape</p>	<p>Potential room to create supportive insoles per order</p>	<p>Not many companies get into the insole business, could be wasted R/D</p>
	<p>Midsole: Soft Foam Extremely comfortable</p>	<p>Only comes in neutral style (No built in support)</p>	<p>Creating other performance midsoles on same upper</p>	<p>Tooling costs a lot of money it is more common to change upper not tooling</p>
	<p>Outsole: Minimal design aesthetic</p>	<p>No rubber for performance. No lugs, minimal pattern</p>	<p>Either adding more aggressive pattern or the potential of rubber pods on sole</p>	<p>Increasing in cost and complexity</p>



	STRENGTH	WEAKNESS	OPPORTUNITY	THREAT
 <p>Allbirds Wool Runner Responsible</p> <p>SUSTAINABILITY</p>	<p>Upper: Natural material base - wool, bio-based water resistant coating</p>	<p>Not Vegan, what was the treatment of animals like?</p>	<p>Tell direct story of sourcing with each purchase - give back to herds</p>	<p>Spending too much money on telling the story</p>
	<p>Insole: Renewable materials -wool top, castor bean foam</p>	<p>Not Vegan, what was the treatment of animals like?</p>	<p>Tell direct story of sourcing with each purchase - give back to herds</p>	<p>Spending too much money on telling the story</p>
	<p>Midsole: Sugar-cane material</p>	<p>Blend with EVA</p>	<p>Further develop to eliminate use of EVA</p>	<p>Cost in research and development of new foam technology</p>
	<p>Outsole: Sugarcane foam</p>	<p>Blend with EVA</p>	<p>Further develop to eliminate use of EVA</p>	<p>Cost in research and development of new foam technology</p>

Figure 5. Display of Allbirds Wool Runner Mizzles SWOT Analysis (*Allbirds Men's Wool Runner Mizzles*, 2021).

Recycled Material Category

Category Overview: Shoes made of non-virgin recycled polymers, giving plastics a second life. There are many companies with product that fits in this category, to name a few: Nike, Teva, Adidas, Rothy's, Timberland, Nothing New, Greats and many more (Cowley, 2021).

In this category Nike has been selected for a deeper dive into it's features and benefits.

Brand: Nike

Name: Space Hippiie 04

Price Point: \$130



Figure 6. Displays example of recycled and remnant material in the Nike Space Hippiie 04 (*Nike Space Hippiie 04 Men's Shoe*, 2021).

Feature/Benefits:

- FlyKnit upper for stretchy, lightweight fit on foot
- Crater foam midsole for stability and comfort under foot
- Deconstructed design for added fashion aesthetic
- Woven-in yarn eyestays for unique look and lock-down fit

Sustainable Materials Used:

- FlyKnit upper made of 75% recycled material (plastic bottles, shirts and yarn scraps)
- Crater Foam mixed with Nike Grind rubber made of recycled components
- Insole made of recycled content (*Nike Space Hippie 04 Men's Shoe, 2021*)

SWOT Analysis

	STRENGTH	WEAKNESS	OPPORTUNITY	THREAT
 <p>SWOT Analysis</p> <p>Nike Space Hippiie 04 Remnant & Recycled</p> <p>PERFORMANCE</p>	Upper: Custom sock-like upper fit and feel	Lack of durability in upper material and construction	Use similar materials to create a performance upper	Stigma of sustainability and performance footwear
	Insole: Added foam cushioning for step-in comfort	Minimal performance features	Potential room to create supportive insoles per order	Not many companies get into the insole business, could be wasted R/D
	Midsole: Foam Midsole	Fashion over performance Sustainability over function	Create something that is recycled and ready to perform top tier	Stigma of sustainability and performance footwear
	Outsole: Rubber Pod Outsole	Fashion over performance Sustainability over function	Create something that is recycled and ready to perform top tier	Stigma of sustainability and performance footwear

	STRENGTH	WEAKNESS	OPPORTUNITY	THREAT
 <p>SWOT Analysis</p> <p>Nike Space Hippiie 04 Remnant & Recycled</p> <p>SUSTAINABILITY</p>	Upper: Remnant and recycled materials	Not 100% recycled content	Rurther develop upper constuction abilities for recycled materials	Stigma of sustainability and performance footwear
	Insole: Remnant and recycled materials	Low percentage recycled content in foam	Rurther develop constuction abilities for recycled materials	Not many companies get into the insole business, could be wasted R/D
	Midsole: Recycled materials	Less than 25% recycled content	Rurther develop constuction abilities for recycled materials	Stigma of sustainability and performance footwear
	Outsole: Recycled materials	Less than 25% recycled content	Rurther develop constuction abilities for recycled materials	Stigma of sustainability and performance footwear

Figure 7. Display of Nike Space Hippiie 04 SWOT Analysis (Nike Space Hippiie 04 Men's Shoe, 2021).

Mono-Material Category

Category Overview: Shoes made of a single material or single material category, making them easier to breakdown and recycle to be remade. There are many companies with product that fits this category, to name a few: Adidas, Crocs, Merrill, Salomon and many others (Team, 2021).

In this category Adidas has been selected for a deeper dive into it's features and benefits.

Brand: Adidas

Name: FutureCraft Loop – Made to be Remade

Price Point: \$180



Figure 8. Displays example of mono-material design Adidas FutureCraft Loop (Adidas Made to be Remade, 2021).

Features/Benefits:

- Sock-like fit for comfort fit to each user
- Lace closure for easy on and off
- Boost midsole for high energy return and low weight
- QR code tongue for easy return process

Sustainable Materials Used:

- Just 1 – TPU (Thermoplastic Polyurethane)
 - Upper
 - Midsole
 - Outsole
 - Laces
 - Insole
- No-dye Upper (*Adidas Made to be Remade*, 2021)

SWOT Analysis

	STRENGTH	WEAKNESS	OPPORTUNITY	THREAT
 <p>Adidas FutureCraft Loop Responsible & Recycled</p> <p>PERFORMANCE</p>	<p>Upper: Sock-like engineered fit</p>	<p>Not able to add performance qualities of non-TPU parts and pieces</p>	<p>Added parts that can be easily disassembled</p>	<p>Losing sight of the idea of a mono-material</p>
	<p>Insole: Added foam cushioning for step-in comfort</p>	<p>Minimal performance features</p>	<p>Potential room to create supportive insoles per order</p>	<p>Not many companies get into the insole business, could be wasted R/D</p>
	<p>Midsole: High responsive technology</p>	<p>Not top tier runner</p>	<p>Develop a TPU shank</p>	<p>Can this shoe be seen as performance and sustainable?</p>
	<p>Outsole: Full length coverage of foam midsole</p>	<p>Not the same durability as rubber</p>	<p>Innovate on TPU performance</p>	<p>Creating new technology is difficult, time consuming expensive</p>

	STRENGTH	WEAKNESS	OPPORTUNITY	THREAT
 <p>Adidas FutureCraft Loop Responsible & Recycled</p> <p>SUSTAINABILITY</p>	<p>Upper: One material TPU</p>	<p>Not able to add performance qualities of non-TPU parts and pieces</p>	<p>Added parts that can be easily disassembled</p>	<p>Losing sight of the idea of a mono-material</p>
	<p>Insole: One material TPU</p>	<p>Not able to add performance qualities of non-TPU parts and pieces</p>	<p>Develop separate recycling program for insole with a higher performing materials</p>	<p>Losing sight of the idea of a mono-material</p>
	<p>Midsole: One material TPU</p>	<p>Sustainability over function-</p>	<p>Develop a TPU shank</p>	<p>Can this shoe be seen as performance and sustainable?</p>
	<p>Outsole: One material TPU</p>	<p>Not the same durability as rubber</p>	<p>Innovate on TPU performance</p>	<p>Creating new technology is difficult, time consuming expensive</p>

Figure 9. Display of Adidas FutureCraft Loop SWOT Analysis (Adidas Made to be Remade, 2021).

Footwear Anatomy

The shoe is a very complex piece of equipment that can be made up of hundreds of parts and pieces. The simplest form of breaking down the shoe anatomy is by splitting it into its most obvious components: upper, midsole, outsole and footbed.



Figure 10. Display of exterior shoe anatomy (insole is inside shoe and not on display in this figure).

Upper

The upper is the top part of the shoe, covering and securing the foot. It can be made of many different materials and is the most adjustable and customizable piece of footwear that can be made for the general public.

There are many purposes that the upper fulfills, but its main jobs to be done are shoe fastening, providing an opening where the shoe and foot come together, weather protection for the top of foot, and general top of foot protection. The upper also holds the foot on top of the midsole/outsole/insole and helps the foot maintain stability.

Midsole

The midsole, in general terms, is the middle section of the shoe – being that it sits between the upper and the outsole. It can also come in many different shapes, sizes and materials depending on the user needs and intended use case of the shoe it is made for.

The midsole's significance to the shoe is extreme as it is often the main source for comfort, stability and protection. The midsole's largest jobs to be done are comfort and cushioning under foot, stability and support (whether that be laterally or medially), rebound and propulsion (energy return) and under foot protection from the every-day elements.

Outsole

The outsole is the bottom of the shoe and in the world of sport performance shoes is most widely known for its use of rubber. Though rubber is often used for outsoles, with modern innovation and differing use cases there are many other materials that are used in this application as well.

The job of the outsole differs depending on the environment it is placed in and its necessary application. It is used as the direct contact between the user and its shoe to the ground surface. The outsole's main jobs to be done are traction on varied surfaces, under foot protection and weather protection against the elements.

Insole

The insole is often the most overlooked anatomy piece in a shoe (as can be referred to its absence in the graphic above), potentially to its presence inside the shoe and lack of overall visibility. Though it takes a little extra searching for, the impact of the insole can be immediate as it is the first point of contact between the shoe and the bottom of the user's foot.

Depending on the use case and user needs the insole can be the most important piece to a shoe's anatomy or the least. The main jobs to be done for the insole are cushion and comfort under foot, arch stability and support, metatarsal comfort and support and heel cushioning. Insoles can be made with the highest amount of customization to the most generic form as well.

State of the Art Materials

In the world of sustainable materials there are many new innovations and findings as far as ways to create new material are concerned. Below is a small list of new materials that are being made to replace the excessive use of petroleum and other non-sustainable materials in footwear.

Upper

- Wool: Sheep sourced, Knit or woven (Cowley, 2021)
- Hemp: Cannabis Sativa, Knit or woven (Cowley, 2021)
- Recycled Plastics: Cleaned, shredded and melted – Knit, woven or injected (Cowley, 2021)
- Cactus Leather: Cactus Plant, Non-woven (Cowley, 2021)
- Pineapple Leather: Pineapple Plant, Non-woven (Cowley, 2021)
- Coffee: Coffee Grounds, Extruded – Knit or woven (Cowley, 2021)

Tooling

- Natural Rubber: Latex, Extruded (Cowley, 2021)
- Recycled Plastics: Cleaned, shredded and melted – Injected (Cowley, 2021)
- Sugarcane: Sugarcane Plant, Molded (*Allbirds Men's Wool Runner*, 2021)

While all of these innovations and explorations of new sustainable footwear material options are exciting, there is three sections that lend most to the work and ethos of Cotopaxi:

Recycled Plastics, Remnant Material and Responsibly Sourced Material (*Sustainable By Design*, 2021). Recycled plastics have been seen in many of the past products of Cotopaxi and seem to be the reoccurring theme in each new product launch (*Women's Apparel – Cotopaxi*, 2021). Creating awareness of the ability to use these materials in a footwear application will be crucial to the success of the Cotopaxi footwear line.

State of the Art Manufacturing

As different sustainable materials increase in prevalence and demand an increase of sustainable manufacturing process continues as well. Below are different ways the manufacturing is playing a role in sustainable footwear products.

Upper

- Zero Waste Patterning
 - Computer programming optimization in pattern making and cutting process, minimizing material that is not used in production (*Circularity. Nike Circular Design*, 2021)
 - Upper Knitting creates a design option with very minimal cutting and fabric loss in production (*Circularity. Nike Circular Design*, 2021)
 - Pattern planning is done by designing product patterns based on size, shape and availability of materials (Pikkpack, 2016)
- Plastic Recycling
 - Material and product generation and regeneration through a process of cleaning, shredding, melting, and extruding renewed fibers (*Teva Reember Slip-on*, 2021)
- Artisan Loomed Fabrics

- Textiles made by hand with the assistance of simplified tools. This creates a minimal footprint for the material created (*Eco Friendly Shoes*, 2021)

Tooling

- Mono-Material Construction
 - Creating a shoe entirely by one material (upper, midsole, outsole all made by the same material). This extremely increases the ease of recycling the shoe to then repurpose into new material (*Index. 01: Your Questions Answered*, 2021)
 - Injection molded parts like a croc sandal that is not made with glues and very easily broken down and recycled (Pikkpack, 2016)
- Plastic Recycling
 - Material and product generation and regeneration through a process of cleaning, shredding, melting, and extruding renewed material components (*Design & Production of Sustainable Shoes*, 2021)
- Algae Foam Usage
 - Removing harmful algae elements from the waterways to create midsole and outsole components mixed with EVA, therefore decreasing the overall amount of EVA used in the product (Team, 2021)

Intellectual Property

Understanding the landscape of offerings in the footwear industry will be vital for Cotopaxi to understand where they can best make an impact with their design offerings and innovations they need to work around.

Patent US US9114580B2: This patent encompasses the use of “recycled polymeric granulate combined with a binder material” to create a portion of the outwear surface of the shoe. These granulates being “1mm to 12mm” in size (Aetrex, 2013).

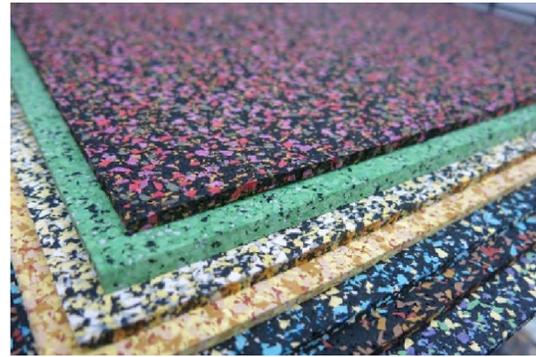


Figure 11. Display example of recycled foam.

This patent is significant to Cotopaxi as one of their main forms of sustainability is the use of recycled materials (*Sustainable By Design*, 2021). As the midsole and outsole are created this patent either needs to be avoided or licensed by the brand. In a past collaboration with Teva, Cotopaxi used recycled material in their tooling (midsole and outsole) (*Teva Reember Slip-on*, 2021).

Patent JP6931977B2: This patent addresses the creation of a shoe where the upper, sole, torsion bar, and heel counter are made up of a material “mostly from thermoplastic base materials by weight”.

This patent is addressing the circularity of the shoe and the shoes ability to be

recycled at the end of it’s original use (Mono Material Recycling) (カーマン マルコ, 2015).

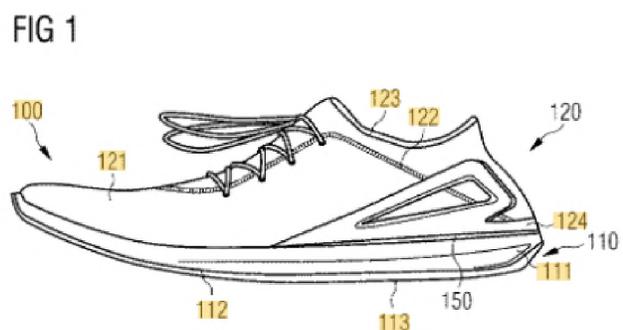


Figure 12. Display illustration of Patent JP6931977B2 (カーマン マルコ, 2015).

This patent is significant to Cotopaxi as they value recycled products and responsibly sourced products (*Sustainable By Design*, 2021). As this is a solution that is more commonly available it is a route that Cotopaxi would consider when creating a new line of footwear. This technology would either need to be avoided or licensed by Cotopaxi.

Patent KR20210016441A: This patent covers the use of recycled materials that have been “ground, pulverized and treated with a resin and blowing agent”. They are then heat activated in the mold and expanded by the blowing agent to fill to mold space and create the article of footwear. This process

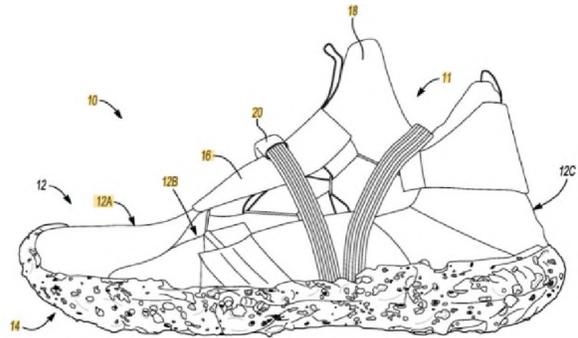


Figure 13. Display illustration of Patent KR20210016441A (브라이언 엔 패리스, 2018).

provides a very unique look to recycled material used in the footwear tooling (브라이언 엔 패리스, 2018).

This patent is significant to Cotopaxi as one of their main forms of sustainability is the use of recycled materials (*Sustainable By Design*, 2021). As the tooling components are created this patent either needs to be avoided or licensed by the brand. In a past collaboration with Teva, Cotopaxi used recycled material in their tooling (midsole and outsole) (*Teva Reember Slip-on*, 2021).

State of the Art Color and Future Trends

Cotopaxi, as a company is known for its extreme color combinations, pastels and the overall unique aesthetic of their product. What it comes to material choices Cotopaxi follows it's creed to “Do Good” and selects materials that either come from Remnant material, Recycled

material or are Responsibly sourced material (Cotopaxi 3 Rs of sustainable product) (*Sustainable By Design*, 2021).

Current Cotopaxi Color

The most popular and longest standing products from Cotopaxi come from their Remnant line of bags and apparel (Del Dia Bags – Teca Windbreakers). Being that the material from these products comes from leftover fabric from larger companies, Cotopaxi isn't able to create large quantities of the same colorway for long periods of time (*Sustainable By Design*, 2021). This creates an interesting aesthetic where Cotopaxi is often releasing new bags and jackets of extreme color pop. It's not often that you see others with the same colored jacket or bag because there is so much color variation. In other product collections like the Cada Dia Collection (*Sustainable By Design*, 2021), Cotopaxi leans on their expertise in color to add small pieces of color pop, while using other dark and more subdued hues to bring a different aesthetic and perhaps reach a different customer base.



Figure 14. Display of current Cotopaxi colorways on existing product collections (*Sustainable By Design*, 2021)

Future Color Potential

The Galactic Oil color and material trend could be an area where Cotopaxi extend. Using it's experience with color pop, this step further could bring a really interesting splash of color that the current Cotopaxi user would understand, enjoy and gravitate towards (*New Mythologies*, 2021).

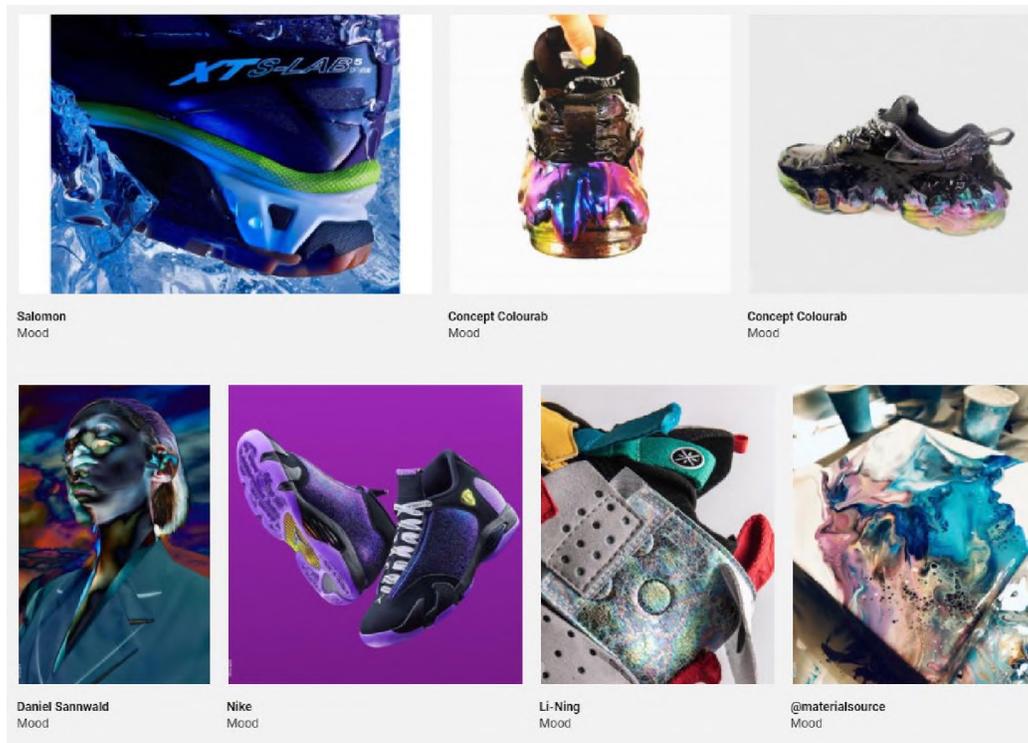


Figure 15. Display of potential future color options, Galactic Oil theme (*New Mythologies*, 2021).

State of the Art Graphics and Future Trends

Being a company that is not afraid to express themselves Cotopaxi also has often been known to create apparel and accessories that flaunt interesting graphics and prints as well. Their current application of graphics and prints can be seen on their Teca Jackets, Del Dia Bags and Logo-wear apparel pieces (t-shirts and sweaters) (*This is Cotopaxi*, 2021).

Current Cotopaxi Graphics

As was mentioned in the Current Cotopaxi Color section, the team at Cotopaxi is not shy to play with color experiments on the Teca jackets and Del Dia bag line. This is also where new prints and interesting graphics are also often on display. Reference here are two different Teca windbreakers that have extreme patterns on the upper portion and sleeve area of jacket. It is just a different way that Cotopaxi color blocks and adds variety to their product offering (*This is Cotopaxi, 2021*).

Another area where a variety of graphics can be seen are the logo-wear products. Graphic t-shirts and sweaters are commonly used to share different graphics. The most common graphics seen are the creed, “DO GOOD” or “GEAR FOR GOOD” as those are the messages that Cotopaxi is trying to convey to the public. Another common graphic used is their llama logo. Often distorted or portrayed in other forms, the llama graphic is one of Cotopaxi’s main identifiers and is something they use in a lot of different places (*This is Cotopaxi, 2021*).



Figure 16. Display of current Cotopaxi graphics on apparel selection (*This is Cotopaxi, 2021*).

Future Graphic Potential

Technology callouts are a trend that has become more and more prevalent in the consumer goods industry and something that could continue to be special (*Recrafted Revival*, 2021).

Cotopaxi could follow Asics in this case (bottom image on the right), but instead of calling out GORE-TEX, it could call out a technology feature in their own scope, some examples could be:

100% RECYCLED, FAIR TRADE or WASTE SAVED. This could bring good attention to their cause.



Figure 17. Display of potential future Cotopaxi graphic applications (*Recrafted Revival*, 2021).

State of the Art Logos and Future Trends

Logos, wordmarks and their placement are critical to each company in their quest to create an identity and provide consistency that customers can rely on as they are making their shopping decisions. Cotopaxi is no different in this scenario. They have 4 different identifiers that they use throughout their products (*This is Cotopaxi*, 2021).

Logo

The Cotopaxi logo is the silhouette of a llama's head and neck. It is a simple and fun logo that is easily placed on the left chest of clothing, center-top of backpacks and throughout varying trims on all products (*This is Cotopaxi*, 2021).

Wordmark

The wordmark to go along with the logo is their name, Cotopaxi, named after a volcano in Bolivia that was significant to the founder's life journey (*This is Cotopaxi, 2021*).

Other brand identifiers are the taglines, DO GOOD and GEAR FOR GOOD. These brand identifiers are often time set on their own as in the reference on the t-shirt in the top right corner of this page or used as secondary branding on the back of apparel pieces or trims of bags.



Figure 18. Display of current logo and branding applications (*This is Cotopaxi, 2021*).

Future Logo Potential

As Cotopaxi progresses as a brand focused on sustainable and purposeful design. It should consider following the trend of functional logo applications. Looking for ways to add function into their branding. Whether through reflectivity, support or other features (*Sneaker Materials, 2021*).



Figure 19. Display of potential future logo and branding applications (*Sneaker Materials, 2021*)

Physiological Research of Hiking

Essential Task: Hiking on uneven terrain with a change in pace (fast or slow) and duration during participation in the Questival event

Goal: Arrival at desired location

Jobs To Be Done: Maintain comfortable and efficient levels of VO₂ consumption, minimize sweating on foot and rapid breathing by maintaining appropriate pace (overall energy output and metabolic cost) (PeakMind, 2009).

Observation: As participants in the Questival event go about accomplishing their tasks their overall energy output can be monitored through symptoms such as rapid breathing and heavy sweating. As they select a pace of movement, they are selecting an exertion level between two possible extremes: high exertion and long exertion. They can work at a very high rate for a short period of time, they can work for a very long period of time by using a low rate of exertion, or they can select some level in between. Measuring the level of effort to maintain a pace that balances their needs to move as fast as possible without becoming exhausted and to have long endurance without moving too slowly is key to understanding their ability to continue and be successful in the event (PeakMind, 2009). The ability to continue hiking at a given rate of exertion is all dependent on VO₂ consumption rates and efficiencies. Levels of sweat on feet can vary based on location and climate, but can be lessened by providing breathable footwear solutions.

Biomechanical Research of Hiking

Essential Task: Hiking on uneven terrain with a change in pace (fast or slow) and duration during participation in the Questival event

Goal: Arrival at desired location

Jobs To Be Done: Plantar and dorsiflexion and efficient movement through gate cycle

Observation: In a study published in the Journal of Experimental Biology, a closer look was taken at studying the affects of walking on uneven terrain (a controlled format to simulate hiking in a lab setting) to the bodies over biomechanics. Key points that were examined were gait cycles compared to walking on even terrain (Voloshina, 2013). Findings from this study are listed below:

- Decreased stride length by 4% (Voloshina, 2013)
- Step variability increased by 36% (width and length) (Voloshina, 2013)
- Positive knee work increased by 28% (Voloshina, 2013)
- Positive hip work increased by 62% (Voloshina, 2013)
- Mean muscle activity increased throughout lower leg and thigh (Voloshina, 2013)

Product Intervention: How can footwear help? It is really interesting to see the different ways that changing the environment and the variability in surface terrain can have on the bodies overall biomechanics. This increase in load on the lower body is without consideration of footwear potential footwear solutions. Creating footwear that supports efficient locomotion without sacrificing stability would help these athletes to potential improve their biomechanical inefficiencies or at least help them to maintain progress and not decrease efficiencies in locomotion.

Psychological Research of Sustainability

Essential Task: Representing core values through footwear, apparel and gear

Cotopaxi 3 R's: Remnant - Recycled – Responsible (*Sustainable By Design*, 2021)

Goal: Sustainable offerings that both function in providing physical comfort and the ability to perform necessary tasks and function in an eco-friendly presence in the product ecosystem

Observation: Understanding the sustainability mindset is key to creating great product that people want to use and gravitate towards. “Research explains why people go out of their way to behave sustainably, and how it is possible to motivate and empower sustainable actions. The goal of the psychology of sustainable behavior is to create the conditions that make sustainable action the most appealing or natural choice” (Manning, 2009). Cotopaxi as a company does many things to communicate their sustainability to potential customers. Listed below are ways that Cotopaxi can encourage sustainable action and make connections with those who might use their product. Each point comes from the study of The Psychology of Sustainable Behavior and is further extrapolated to apply directly to Cotopaxi (Manning, 2009).

- *Make sustainable behavior the social default:* Cotopaxi has committed to creating 100% of product that is either Responsible, Remnant or Recycled by 2025 (currently at 94%) (*Sustainable By Design*, 2021).
- *Emphasize personal relevance:* Cotopaxi can emphasize their “Do Good” campaign to bring home the message that each purchase you make does make a difference to someone in need (*This is Cotopaxi*, 2021).
- *Make hidden information visible:* Cotopaxi has created a culture of visible information with their openness to their factory work and the lifestyle these workers live, you can see what factories they use and why they use them listed on their website (*Bataan Factory*, 2021).
- *Foster Mindfulness:* With each product sold Cotopaxi talks about its purpose in being made and why that is necessary, this is something that should be continued and

emphasized to foster mindful, needs based shopping rather than “fast fashion” trend hunting (*Women’s Apparel – Cotopaxi, 2021*).

- *Create opportunities for competence, skills, and knowledge:* The Questival events in the past and future are a place where Cotopaxi can educate it’s consumers. Tasks to educate yourself comprise 1/3 of the activities in the Questival event (*Questival User Experience Audit, 2017*).
- *Balance urgency with realistic hope:* While 100% sustainable product is the goal, not everything can be done today. This goal has been set for 2025 and is something the company is work towards (*Sustainable By Design, 2021*).

Following these tips will help Cotopaxi reach their customer in a deeper than surface level way.

It will create a bond with users and their value system which is something that can only help the brand. Aside from the overall focus on sustainability the need to create a comfortable shoe is also important psychologically to the customer. First impressions of comfort when trying on a shoe helps customers make the decision to purchase and continued comfort and support through wear helps the customer continue to with the brand and build a connection for future purchases.

Nailing sustainability and comfort and essential to the success of the Cotopaxi footwear line.

User and Consumer Research Methodology Plan

Method 1: Understanding sustainable footwear market and target user

- Social Media Review (Hashtag and relevant searches)
- Cotopaxi Retail
- Footwear Retailers
- Industry Review

Plan: Review and study will be done over the next two weeks through social media, traveling to the Seattle Cotopaxi retail store, REI and Dick's Sporting Goods to better understand the sustainable footwear market and hiking/travel footwear market better.

Price points, features and key characteristics will be documented and contrasted between the shoes.

Method 2: Key Features and Sustainability understanding

- Survey and Questionnaire
- Shadowing/Day in a life
- Video Interview

Plan: Surveys will be sent out on Reddit sustainability channels, social media and to industry professionals working in sustainable product creation and see how they would interpret Cotopaxi's sustainability guidelines pertaining to footwear [Remnant – Recycled – Responsible (*Sustainable By Design*, 2021)]. Interviews have been planned and will be executed with professionals from Blue Sign, Columbia Sportswear and Cotopaxi.

Information will be synthesized and key similarities and goals of companies will be analyzed.

User Research Goals - Questionnaire

The goal of this questionnaire is to better understand how people interpret Cotopaxi's sustainability guidelines for footwear. By connecting with current employees of the brand and receiving their direct input, it will provide a clear guideline on how Cotopaxi would pursue a footwear line and what their customers would expect to see from the company.

10 Questions for Cotopaxi Footwear - <https://forms.gle/nMAhHPEP1sMHB9Gy7>

1. As I have studied the sustainability goals of Cotopaxi on the company website and in different articles I've read, the sustainability goals for the product are creating gear that is either REMNANT, RECYCLED or RESPONSIBLE. Do you agree with this?
 - a. Yes
 - b. No
 - c. Other _____
2. If anything is missing from the goals stated in question one, please add them here. (N/A if we are all set)
 - a. _____
3. What is the most challenging part of applying these goals in the product creation process?
 - a. _____
4. If you could update the sustainability goals, would you change them?
 - a. Yes
 - b. No
5. If yes, could you briefly explain in what ways you would change them?
 - a. _____
6. In your opinion, can a company of Cotopaxi's size make an impact and be successful in the sustainable footwear industry?
 - a. Yes
 - b. No
7. If no, can you please explain?
 - a. _____
8. What is the most impactful form of sustainability Cotopaxi could focus on in a new footwear line, if it were to be pursued?
 - a. Responsible Sourcing
 - b. Remnant Materials
 - c. Recycled Materials
 - d. Natural/Bio Materials
 - e. Biodegradable
 - f. (Other/Multiple) _____
9. What is the greatest barrier for Cotopaxi to enter the market of sustainable footwear?
 - a. Knowledge/Ability
 - b. Team Size/Bandwidth
 - c. Priority in Leadership
 - d. Cost
 - e. Availability of materials
 - f. Factory capabilities
 - g. Performance Quality of available materials
 - h. Other _____
10. When you talk with Cotopaxi customers – what do they like to use your products for the most?

- a. Casual Hiking
 - b. Strenuous Hiking (Thru Hiking, Multi-Day Backpacking, etc.)
 - c. Vacation Travel
 - d. Exercising
 - e. Questival (Similar Adventuring)
 - f. Everyday Wear
 - g. Streetwear/Fashion
 - h. Other _____
11. What is the priority level for sustainability of the Cotopaxi core customer (in your opinion)?
- a. High
 - b. Moderate
 - c. Low
12. Where best would you see Cotopaxi making an impact in sustainable footwear [Sustainable Factors – Brands Represented]?
- a. Natural Materials, Bio-based Materials (Allbirds)



Figure 20. Display of Allbirds Wool Runner Mizzles (*Allbirds Men's Wool Runner Mizzles*, 2021).

- b. Recycled Materials, Repurposed Materials (Nike)



Figure 21. Display of Nike Space Hippie 04 (*Nike Space Hippie 04 Men's Shoe*, 2021).

- c. Mono-Material Product, Lifecycle, Recycling Program (Adidas)



Figure 22. Display of Adidas FutureCraft Loop (*Adidas Made to be Remade*, 2021).

- d. Eco-Friendly Materials, Recycled Plastics/Rubber, Cork (Nothing New)



Figure 23. Display of Nothing New Shoe (Team, 2021).

- e. Vegan Leathers, Organic Cotton, Low-Waste Production (Veja)



Figure 24. Display of Veja shoe (Team, 2021).

- f. Sustainable Materials, Vegan, Plant-Based Materials, Plant 2 Trees w/purchase (Cariuma)



Figure 25. Display of Cariuma shoe (Team, 2021).

- g. Vegan, Low-Waste Production, Shoe Recycling Program (On Running)



Figure 26. Display of On Running shoe (Team, 2021).

- h. Other _____

User Insights – Questionnaire

Here is a list of key insights from the respondents to the questionnaire:

- The majority of respondents voted that Cotopaxi would be most impactful in creating a shoe made from Remnant material. Responsible and

Recycled material were close behind, showing a belief from the Cotopaxi employees that they could follow their current design strategy for footwear.

- The order of use case that the core Cotopaxi customer purchases their gear for is as follows: Everyday Wear, Casual Hiking, Vacation Travel, Questival, Strenuous Hiking, Streetwear/Fashion, Exercising.
- Cotopaxi customers are in-between high and moderate on the scale of sustainable product needs.
- The shoes that had the most votes for Cotopaxi to follow were Veja, Allbirds and On Running.
- One person surveyed said that the principle of the Nike Space Hippiie 04 was correct, but Cotopaxi would have a totally different output. A good material study and choice for the project.

Performance Testing Plan

Test will follow the following protocols: Breathability, Weight and Water Resistance. The “How Can We” statement for this project was reference in deciding what testing parameters would be set in place (How can we create a sustainable line of footwear for Cotopaxi and it’s target consumer (Millennial and Gen Z), mirroring their focus on remnant, recycled, responsible material and thoughtful design, while achieving excelled performance in the outdoors?).

Breathability

Equipment Needed:

- Shoe Sample
- Shoe Prototype

- Fog Machine
- Bottle to Channel Fog
- Light Booth
- Camera

Process Plan

- Place fog machine in shoe and add water, turn on to start fogging
- Observe the shoes ability to allow fog to escape the upper
- Record entire process for 3 minute time frame
- Repeat on next sample

Data Analysis

- Through study of video recordings, I will be able to compare the difference between the reference samples and prototypes to show an improved visual benefit to upper breathability

Weight

Equipment Needed:

- Shoe Sample
- Shoe Prototype
- Shoe Scale
- Camera

Process Plan

- Calibrate scale to grams
- Place shoe on scale

- Capture final weight through an image taken by the camera
- Repeat for next sample

Data Analysis

- Through study of the measurements received from the scale/weight data, I will be able to compare the difference between the reference samples and prototypes to show an improvement in the overall weight

Water Resistance

Equipment Needed:

- Shoe Sample
- Shoe Prototype
- Clear Tank Filled with Water
- Camera
- Hydrochromic Water Activated Ink
- Brush to Apply Ink
- Weighted Item to Maintain Placement

Process Plan

- Apply hydrochromic ink to insoles of shoes, evenly across top piece
- Place shoes (with insole) in clear tank with weights for stabilization
- Slowly add water to tank until it is just below the opening of the tongue and throat of the shoe.
- Wait 3 minutes
- Record entire process on video camera
- Take shoe out of tank and observe shoe

- Observe insole discoloration

Data Analysis

- Through study of the video recording I will be able to compare how fast it took for the insole to change color in each sample and prototype - I will also be able to analyze the amount and distance spread across the insole by comparing the insoles after each experiment

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브라이언 엔 패리스. (n.d.). *KR20210016441A - footwear articles, manufacturing systems and processes for molding footwear using RECYCLED PLASTIC*. Google Patents. Retrieved November 4, 2021, from

<https://patents.google.com/patent/KR20210016441A/en?q=recycled%2Bshoes&oq=recycled%2Bshoes>.

カーマン マルコ. (2015, April, 16). *JP6931977B2 - Sports Shoes - Mono Material Recycling*.

Google Patents. Retrieved November 4, 2021, from

<https://patents.google.com/patent/JP6931977B2/en?q=recycled%2Bshoes&oq=recycled%2Bshoes>.

Figures

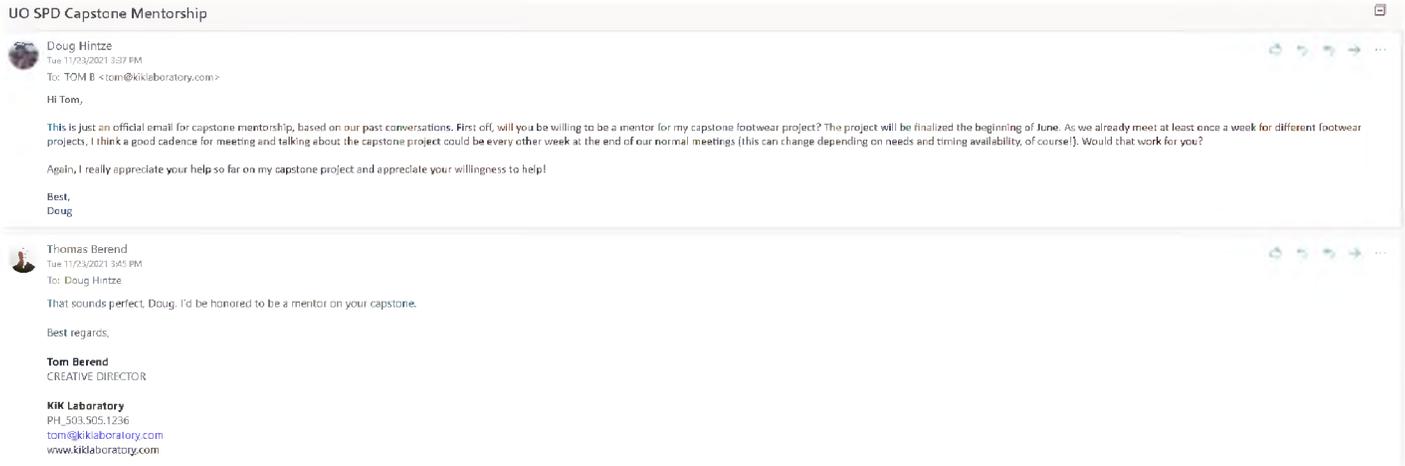


Figure 27. Display of email mentorship confirmation from Tom Berend (Berend, 2021).

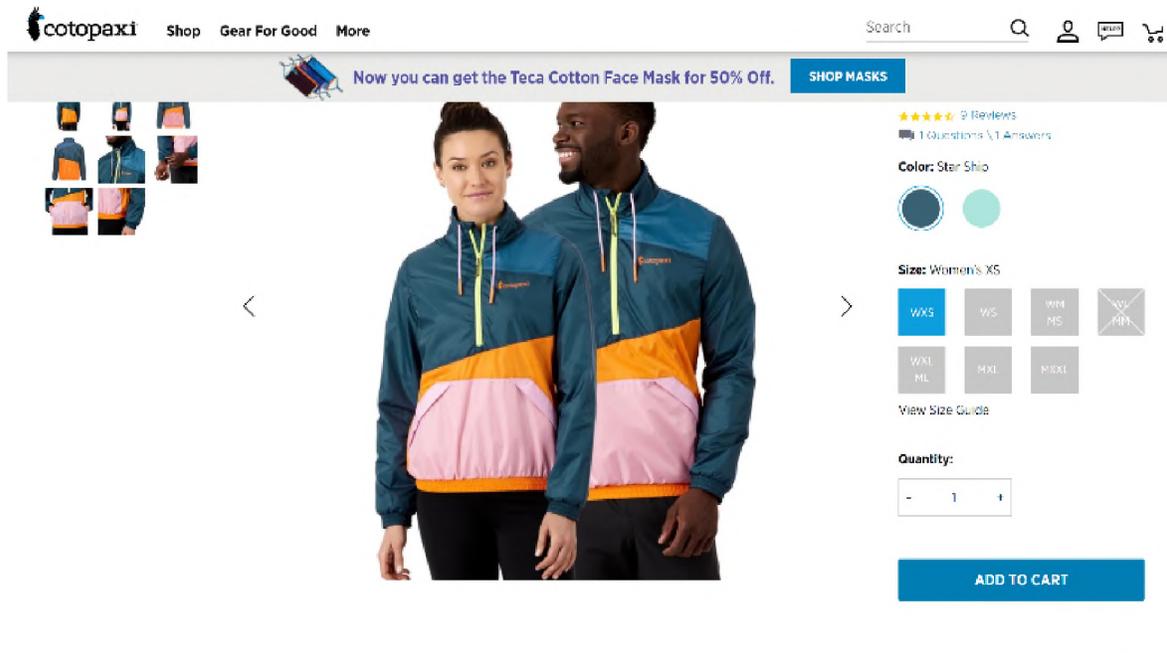


Figure 2. Displays the Cotopaxi Teca Windbreaker (*Women's Apparel – Cotopaxi*, 2021).



About this Factory

Location: Phnom Penh, Cambodia

Manufacturing details: The Baja Pant is produced at one of the most well-respected activewear manufacturers. Located in Cambodia, this best-in-class factory is revered for its sustainability and energy efficiency. [Learn more](#) about this factory.

Figure 3. Displays the transparency Cotopaxi shows with its factory development (*Bataan Factory*, 2021).



Figure 4. Displays example of responsibly sourced Allbirds Wool Runner Mizzles (*Allbirds Men's Wool Runner Mizzles*, 2021).



Figure 5. Displays Allbirds Wool Runner Mizzles SWOT Analysis (*Allbirds Men's Wool Runner Mizzles*, 2021).



Figure 6. Displays example of recycled and remnant material in the Nike Space Hippie 04 (Nike Space Hippie 04 Men's Shoe, 2021).

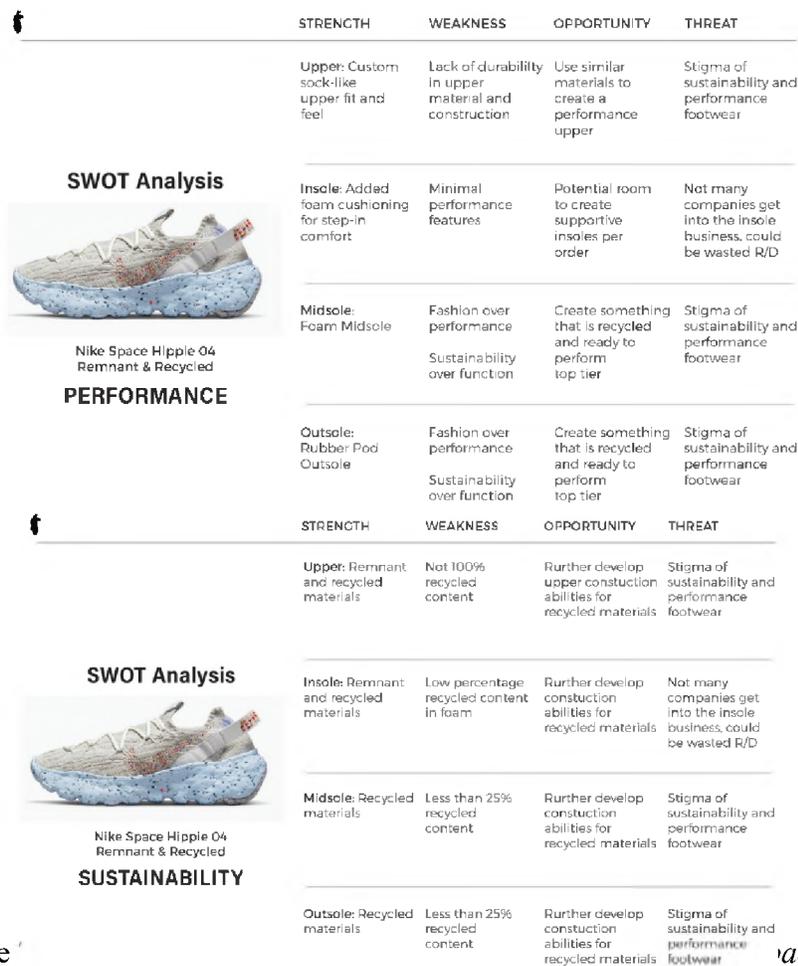


Figure 7

Figure 8. Displays example of recycled and remnant material in the Nike Space Hippie 04 Men's Shoe, 2021).



Figure 8. Displays example of mono-material design Adidas FutureCraft Loop (*Adidas Made to be Remade*, 2021).



Adidas FutureCraft Loop
Responsible & Recycled

PERFORMANCE

STRENGTH	WEAKNESS	OPPORTUNITY	THREAT
Upper: Sock-like engineered fit	Not able to add performance qualities of non-TPU parts and pieces	Added parts that can be easily disassembled	Losing sight of the idea of a mono-material
Insole: Added foam cushioning for step-in comfort	Minimal performance features	Potential room to create supportive insoles per order	Not many companies get into the insole business, could be wasted R/D
Midssole: High responsive technology	Not top tier runner	Develop a TPU shank	Can this shoe be seen as performance and sustainable?
Outsole: Full length coverage of foam midssole	Not the same durability as rubber	Innovate on TPU performance	Creating new technology is difficult, time consuming expensive



Adidas FutureCraft Loop
Responsible & Recycled

SUSTAINABILITY

STRENGTH	WEAKNESS	OPPORTUNITY	THREAT
Upper: One material TPU	Not able to add performance qualities of non-TPU parts and pieces	Added parts that can be easily disassembled	Losing sight of the idea of a mono-material
Insole: One material TPU	Not able to add performance qualities of non-TPU parts and pieces	Develop separate recycling program for insole with a higher performing materials	Losing sight of the idea of a mono-material
Midssole: One material TPU	Sustainability over function-	Develop a TPU shank	Can this shoe be seen as performance and sustainable?
Outsole: One material TPU	Not the same durability as rubber	Innovate on TPU performance	Creating new technology is difficult, time consuming expensive

Figure 9. Displays Adidas FutureCraft Loop SWOT Analysis (*Adidas Made to be Remade*, 2021).



Figure 10. Display of exterior shoe anatomy (insole is inside shoe and not on display in this figure) (Hintze, 2021).



Figure 11. Display example of recycled foam (Aetrex, 2013).

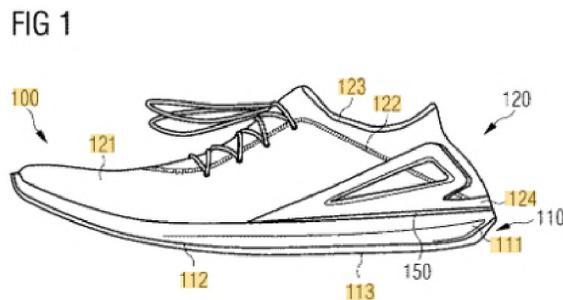


Figure 12. Display illustration of Patent JP6931977B2 (カーマン マルコ, 2015).

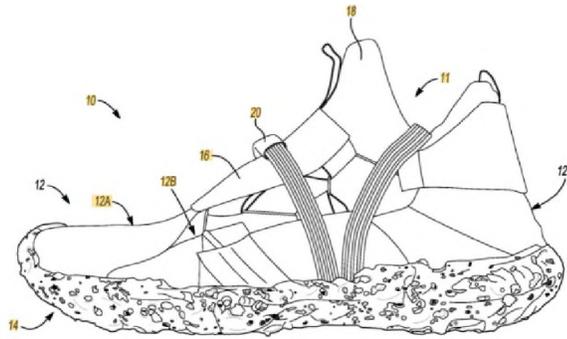


Figure 13. Display illustration of Patent KR20210016441A (브라이언 엔 패리스, 2018).



Figure 14. Display of current Cotopaxi colorways on existing product collections (*This is Cotopaxi*, 2021).

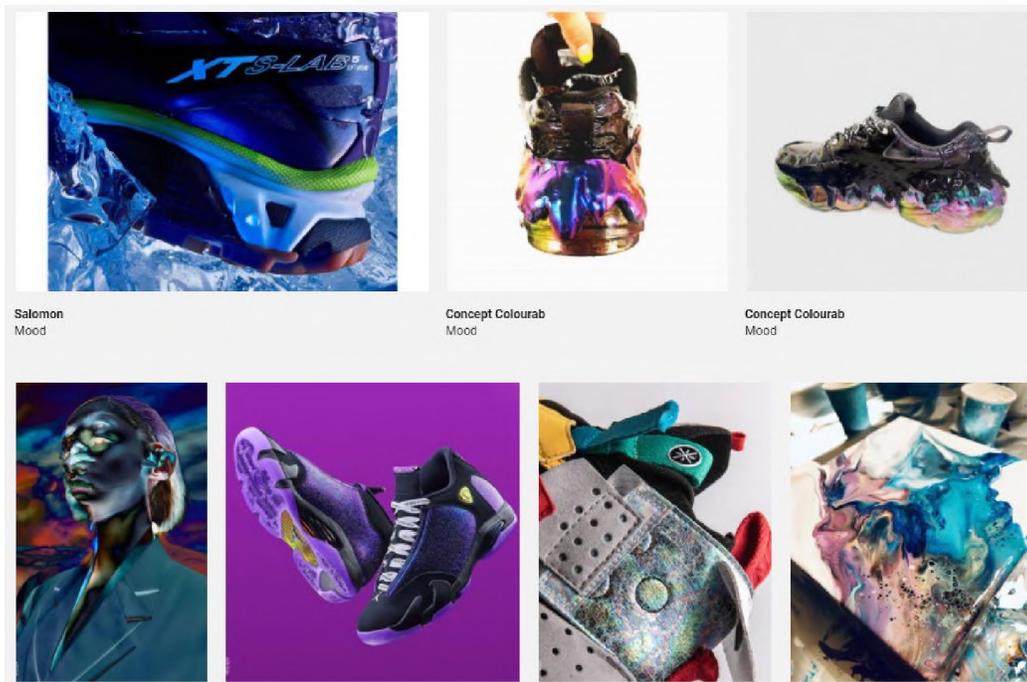


Figure 15. Display of potential future color options, Galactic Oil theme (*New Mythologies*, 2021).



Figure 16. Display of current Cotopaxi graphics on apparel selection (*Women's Apparel – Cotopaxi, 2021*).



Figure 17. Display of potential future Cotopaxi graphic applications (*Recrafted Revival, 2021*).



Figure 18. Display of current logo and branding applications (*This is Cotopaxi, 2021*).



Figure 19. Display of potential future logo and branding applications (*Sneaker Materials*, 2021).



Figure 20. Display of Allbirds Wool Runner (*Allbirds Men's Wool Runner*, 2021).



Figure 21. Display of Nike Space Hippiie 04 (*Nike Space Hippiie 04 Men's Shoe*, 2021).



Figure 22. Display of Adidas FutureCraft Loop (*Adidas Made to be Remade*, 2021).



Figure 23. Display of Nothing New Shoe (Team, 2021).



Figure 24. Display of Veja shoe (Team, 2021).



Figure 25. Display of Cariuma shoe (Team, 2021).



Figure 26. Display of On Running shoe (Team, 2021).

Figure 28. Display of email mentorship confirmation from Tom Berend (Berend, 2021).

Figure 2. Displays the Cotopaxi Teca Windbreaker (*Women's Apparel – Cotopaxi*, 2021).

Figure 3. Displays the transparency Cotopaxi shows with its factory development (*Bataan Factory*, 2021).

Figure 4. Displays example of responsibly sourced Allbirds Wool Runner (*Allbirds Men's Wool Runner*, 2021).

Figure 5. Displays Allbirds Wool Runner SWOT at 50% (*Allbirds Men's Wool Runner*, 2021).

Figure 6. Displays example of recycled and remnant material in the Nike Space Hippiie 04 (*Nike Space Hippiie 04 Men's Shoe*, 2021).

Figure 7. Displays Nike Space Hippiie 04 SWOT Analysis at 50% (*Nike Space Hippiie 04 Men's Shoe*, 2021).

Figure 8. Displays example of mono-material design Adidas FutureCraft Loop (*Adidas Made to be Remade*, 2021).

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Figure 10. Display of exterior shoe anatomy (insole is inside shoe and not on display in this figure) (Hintze, 2021).

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Figure 14. Display of current Cotopaxi colorways on existing product collections (*This is Cotopaxi*, 2021).

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Figure 18. Display of current logo and branding applications (*This is Cotopaxi*, 2021).

Figure 19. Display of potential future logo and branding applications (*Sneaker Materials*, 2021).

Figure 20. Display of Allbirds Wool Runner (*Allbirds Men's Wool Runner*, 2021).

Figure 21. Display of Nike Space Hippiie 04 (*Nike Space Hippiie 04 Men's Shoe*, 2021).

Figure 22. Display of Adidas FutureCraft Loop (*Adidas Made to be Remade*, 2021).

Figure 23. Display of Nothing New Shoe (Team, 2021).

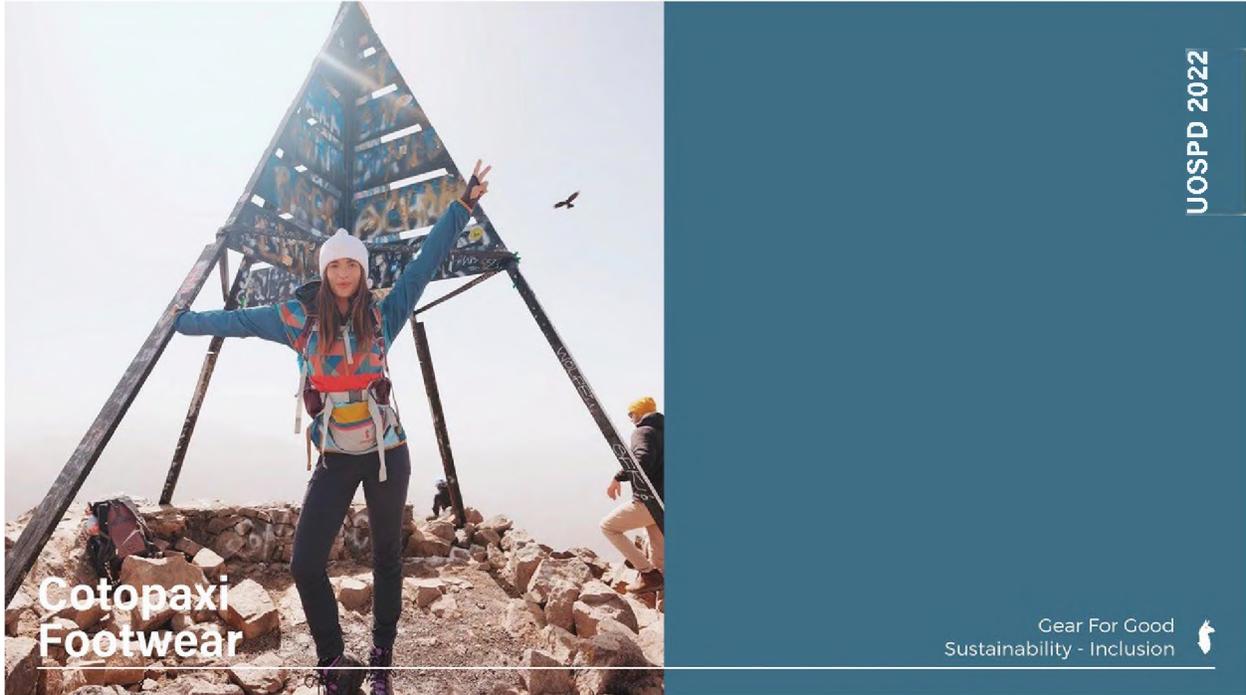
Figure 24. Display of Veja shoe (Team, 2021).

Figure 25. Display of Cariuma shoe (Team, 2021).

Figure 26. Display of On Running shoe (Team, 2021).

SECTION #2: WINTER TERM

The following slides are an outline of the work that was accomplished during the Winter term of the year 2022. Topics covered throughout the term focused on baseline product testing, developing new technologies and providing a final proof on concept to move forward into the final Spring term. This outline was presented for review at the end of the Winter term, the final page is a poster that was made to display baseline testing.





CAREER GOALS

Footwear Designer focused on micro-innovation for macro-impact

Sustainability focus in design work

Problem-solution innovation

Small team size, intersection of 2D and 3D with an impact on the whole process

Design products that inspire new users to connect and gain new experiences

Cotopaxi Footwear



UOSPD 2022

Gear For Good Sustainability - Inclusion



Cotopaxi Footwear

Sustainability through Cotopaxi 3 R's [Remnant, Recycled, Responsible]

COVID-19 Outdoor Boom Size: \$460 Billion (2.1 % of GDP) - Millennials at 38%

Creating an Inclusive Space in Outdoor Footwear With New-To-Outdoor People

Provide Casual and Functional Product

Demonstrating Transparent Supply Chain In Footwear

UOSPD 2022

Gear For Good Sustainability - Inclusion



UO\$PD 2022

 **QUESTIVAL**
ADVENTURE RACE

**Cotopaxi
Footwear**

Gear For Good
Sustainability - Inclusion 



How can we create a sustainable line of entry-level outdoor hiking and travel footwear for Cotopaxi while achieving necessary performance for the outdoors (traction, weight, water resistance, breathability)? 

SENDERO FOOTWEAR COLLECTION



SAN FRANCISCO
RESPONSIBLE



MOAB
RECYCLED



SEATTLE
REMNANT

UOSPD 2022



Gear For Good
Sustainability - Inclusion 

REMNANT

Left-over fabric from other companies production run. Salvageable material from used Cotopaxi product.



RECYCLED

Non-virgin products, being created of recycled content. Nylon, polyester, foam, rubber, etc.



RESPONSIBLE

Responsibly certified fair trade materials. Certified down, organic cotton. Bio-based shoe materials alternatives.





Veja Nova Canvas

Price: \$105
Responsible
Recycled

Durable woven canvas upper for abrasion resistance
High rubber foxing for increased durability
Rubber toe cap for increased protection
Rubber outsole for added durability and traction



Nike Space Hippiie 04

Price: \$130
Remnant
Recycled

Custom sock-like upper for improved fit and feel
Thick foam midsole for increased stability and comfort
Rubber outsole for added durability and traction



Allbirds Wool Runner Mizzles

Price: \$115
Responsible
Recycled

Moisture wicking upper for sweat management
Odder protectant lining for versatility in use style
Soft foam midsole for added comfort
Water resistant upper for improved performance in wet environments
Rubber outsole for added durability and traction



STRENGTH WEAKNESS OPPORTUNITY THREAT

Upper: Durable woven canvas upper	Not necessarily the highest end of performance materials: breathability/ moisture wicking	Added breathable zoning or wicking the upper for water resistance	Losing sight of the idea of a true simple/elegant design language
Insole: Added foam cushioning for step-in comfort	Minimal performance features	Potential room to create supportive insoles per order	Not many companies get into the insole business, could be wasted R/D
Midsole: Added foam cushioning for step-in comfort	Minimal performance features	Potential room to create supportive insoles per order	Not many companies get into the insole business, could be wasted R/D
Outsole: Extruded rubber sole for performance forward movement	Not light weight	Innovate construction to minimize need for excess rubber at bonding areas	Creating a shoe that is less durable and long lasting than would be expected

STRENGTH WEAKNESS OPPORTUNITY THREAT

Upper: Custom sock-like upper fit and feel	Lack of durability in upper material and construction	Use similar materials to create a performance upper	Stigma of sustainability and performance footwear
Insole: Added foam cushioning for step-in comfort	Minimal performance features	Potential room to create supportive insoles per order	Not many companies get into the insole business, could be wasted R/D
Midsole: Foam Midsole	Fashion over performance sustainability over function	Create something that is recycled and ready to perform top tier	Stigma of sustainability and performance footwear
Outsole: Rubber Pod Outsole	Fashion over performance sustainability over function	Create something that is recycled and ready to perform top tier	Stigma of sustainability and performance footwear

STRENGTH WEAKNESS OPPORTUNITY THREAT

Upper: Moisture wicking, odder protectant, soft comfort feel/hand, water resistant	Lack of breathability, shape and form	could engineered knit for help with breathability?	Losing sight of what makes the upper great: simplicity
Insole: Antimicrobial, Moisture wicking sock	Lacks overall support and has neutral shape	Potential room to create supportive insoles per order	Not many companies get into the insole business, could be wasted R/D
Midsole: Soft foam Extremely comfortable	Only comes in neutral style (No built in support)	Creating other performance midsoles on same upper	Tooling costs a lot of money it is more common to change upper not tooling
Outsole: Minimal design aesthetic	No rubber for performance No lugs, minimal pattern	Either adding more aggressive pattern or the potential of rubber pods on sole	Increasing in cost and complexity

How can we create a sustainable line of footwear for Cotopaxi and its target consumer (Millennial and Gen Z), mirroring their focus on remnant, recycled, responsible material and thoughtful design, while achieving excellent performance in the outdoors?

<p>Traction</p>	<p>Breathability</p>	<p>Weight</p>	<p>Water Resistance</p>

Process Plan

- Place fog machine in shoe and add water, turn on to start fogging
- Observe the shoes ability to allow fog to escape the upper
- Record entire process for 3 minute time frame
- Repeat on next sample

Data Analysis

- Through study of video recordings, I will be able to compare the difference between the reference samples and prototypes to show an improved visual benefit to upper breathability.
- How long does it take for fog to come out of upper
- How much fog comes out in the 3 minute time frame



Time to Release Vapor - 2:22
 Amount of Vapor - Medium
 Remnant - 50% More Breathable

Time to Release Vapor - N/A
 Amount of Vapor - Low/None
 Recycled - 50% More Breathable

Time to Release Vapor - 0:45
 Amount of Vapor - Low
 Responsible - 15% More Breathable

Process Plan

- Calibrate scale to grams
- Place shoe on scale
- Capture final weight through an image taken by the camera
- Repeat for next sample

Data Analysis

-Through study of the measurements received from the scale/weight data, I will be able to compare the difference between the reference samples and prototypes to show an improvement in the overall weight



Veja Nova Canvas

349 grams

Remnant - 10% Lighter Weight



Nike Space Hippie 04

346 grams

Recycled - 10% Lighter Weight



Allbirds Wool Runner Mizzles

371 grams

Responsible - 10% Lighter Weight



Process Plan

- Apply hydrochromic stickers on insoles of shoes, evenly across top piece
- Place shoes (with insole) in clear tank with weights for stabilization
- Slowly add water to tank until it is just below the opening of the tongue and throat of the shoe.
- Wait 3 minutes
- Record entire process on video camera
- Take shoe out of tank and observe shoe
- Observe insole discoloration
- Weigh shoe on scale
- Repeat for next sample

Data Analysis

-Through study of the video recording I will be able to compare how fast it took for the insole to change color in each sample and prototype - I will also be able to analyze the amount and distance spread across the insole by comparing the insoles after each experiment

-The weight of the wet shoe will be taken afterward to judge it's level of water intake





Time to Change Color - 0:45
 Number of Dots Wet - All
 440 grams (After Soaking)
 Remnant - 25% More Water Resistant

Time to change color - 0:13
 Number of Dots Wet - All
 479 grams (After Soaking)
 Recycled - 25% More Water Resistant

Time to change color - N/A
 Number of Dots Wet - None
 375 grams (After Soaking)
 Responsible - 5% More Water Resistant



PERFORMANCE TECHNOLOGY OVERVIEW

UOSPD 2022



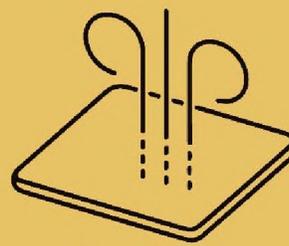
Ground Control

SAN FRANCISCO
 MOAB
 SEATTLE



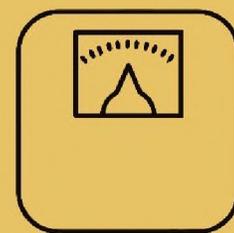
Splash Guard

SEATTLE



Flow Zone

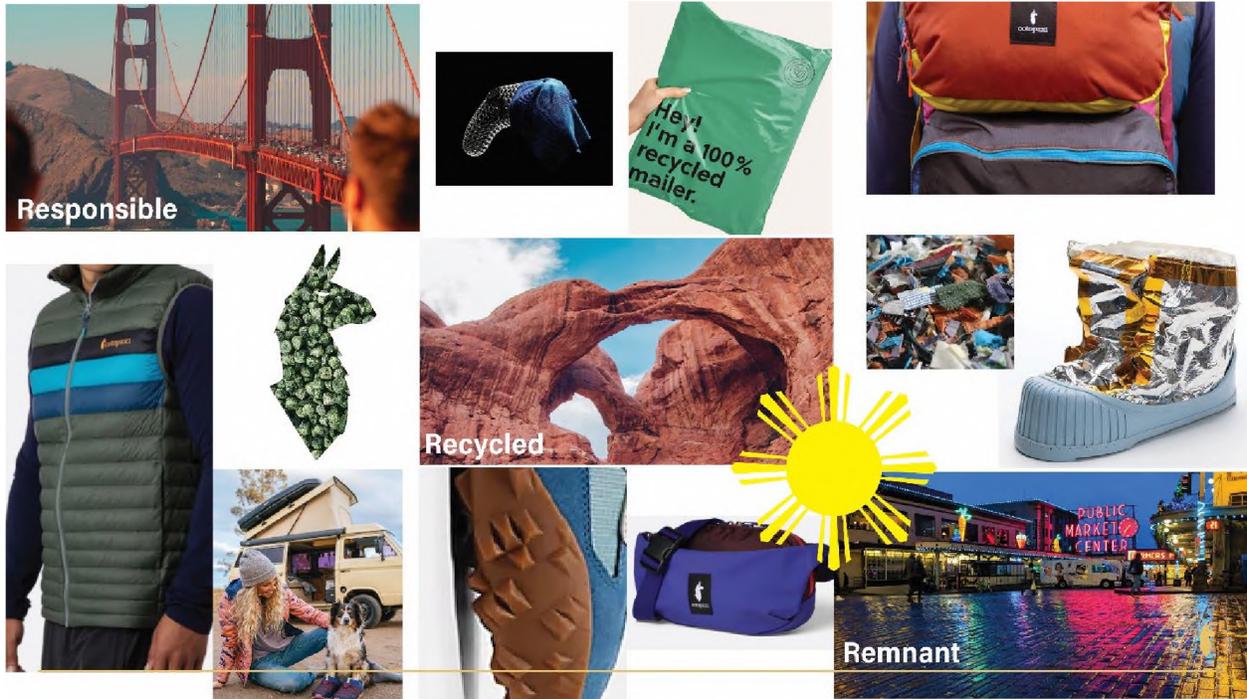
SAN FRANCISCO
 MOAB



Tread Easy

SAN FRANCISCO
 MOAB
 SEATTLE





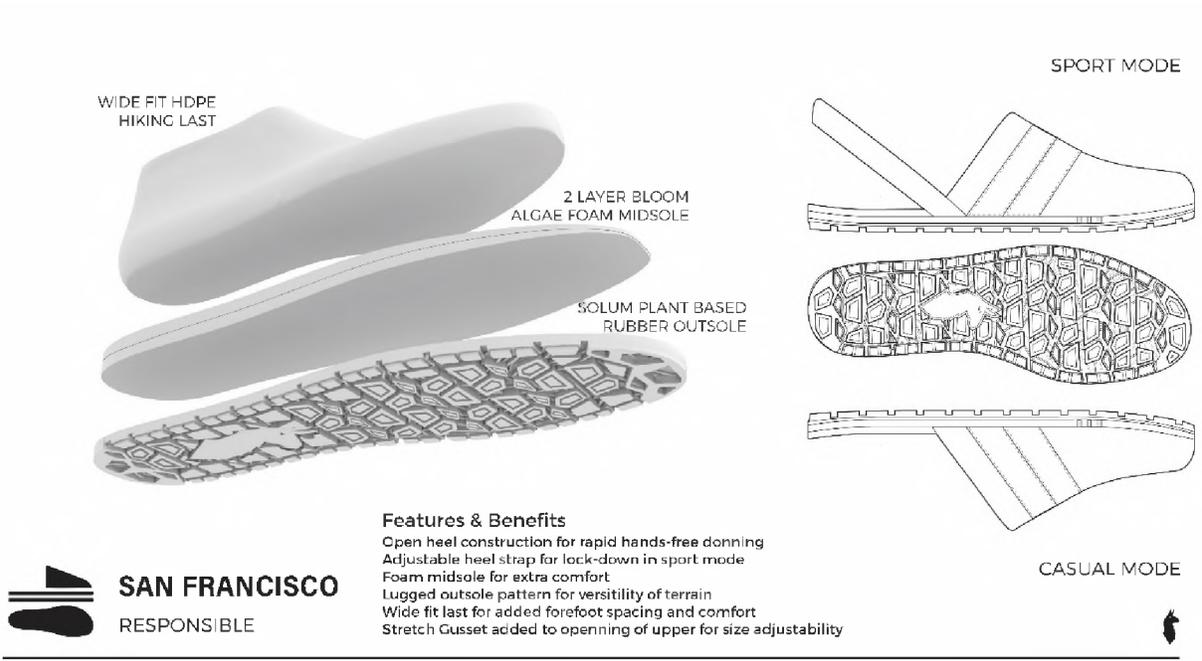
-  **Primary Color**
Blue
-  **Primary Color**
Orange
-  **Primary Color**
Mustard Yellow
-  **Primary Color**
Dark Mint



UOSPD 2022

Cotopaxi Footwear

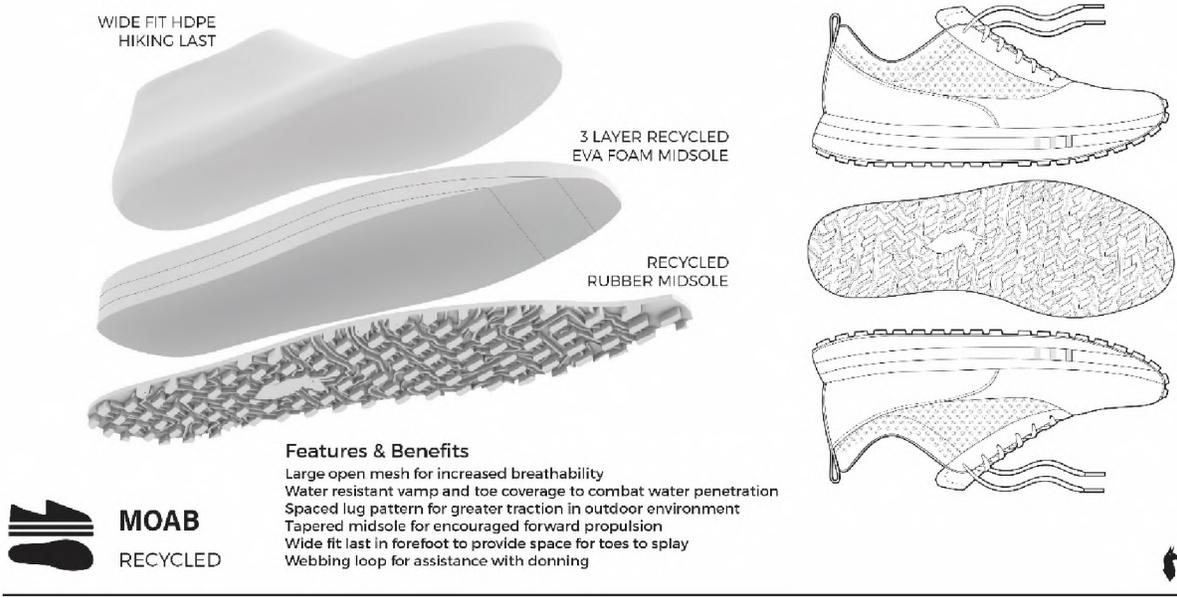
Gear For Good
Sustainability - Inclusion 



Features & Benefits
 Open heel construction for rapid hands-free donning
 Adjustable heel strap for lock-down in sport mode
 Foam midsole for extra comfort
 Lugged outsole pattern for versatility of terrain
 Wide fit last for added forefoot spacing and comfort
 Stretch Gusset added to opening of upper for size adjustability

SAN FRANCISCO
 RESPONSIBLE







SEATTLE
REMNANT

REMNANT
COTOPAXI
LUZON BAG

BAG COMPONENTS

CORD CINCH LOCK

WOVEN POLYESTER UPPER

REMNANT STERNUM STRAP

NYLON WOVEN WEBBING

KNIT POLYESTER SPACER
MESH BAG STRAP

WIDE FIT HDPE
HIKING LAST

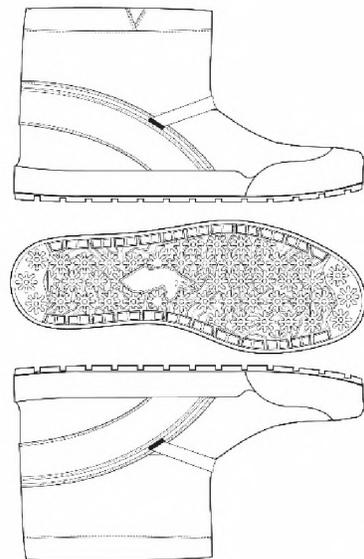
REMNANT VULCANIZED
RUBBER FOXING/OUTSOLE

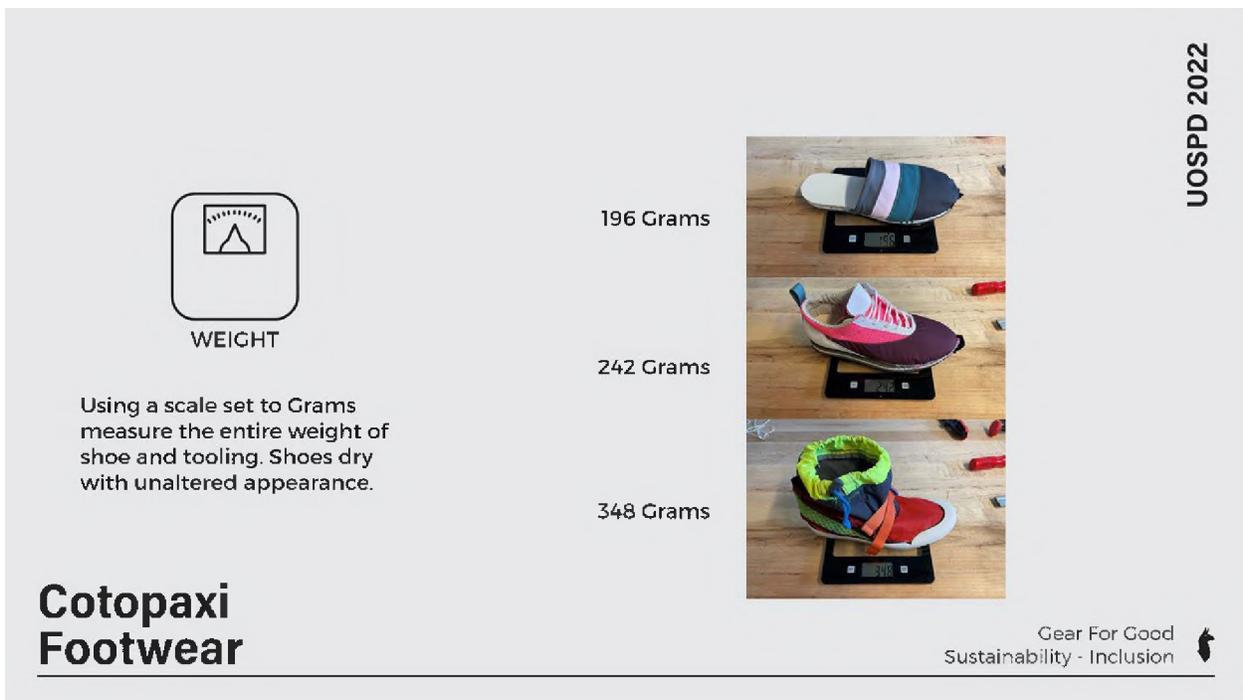
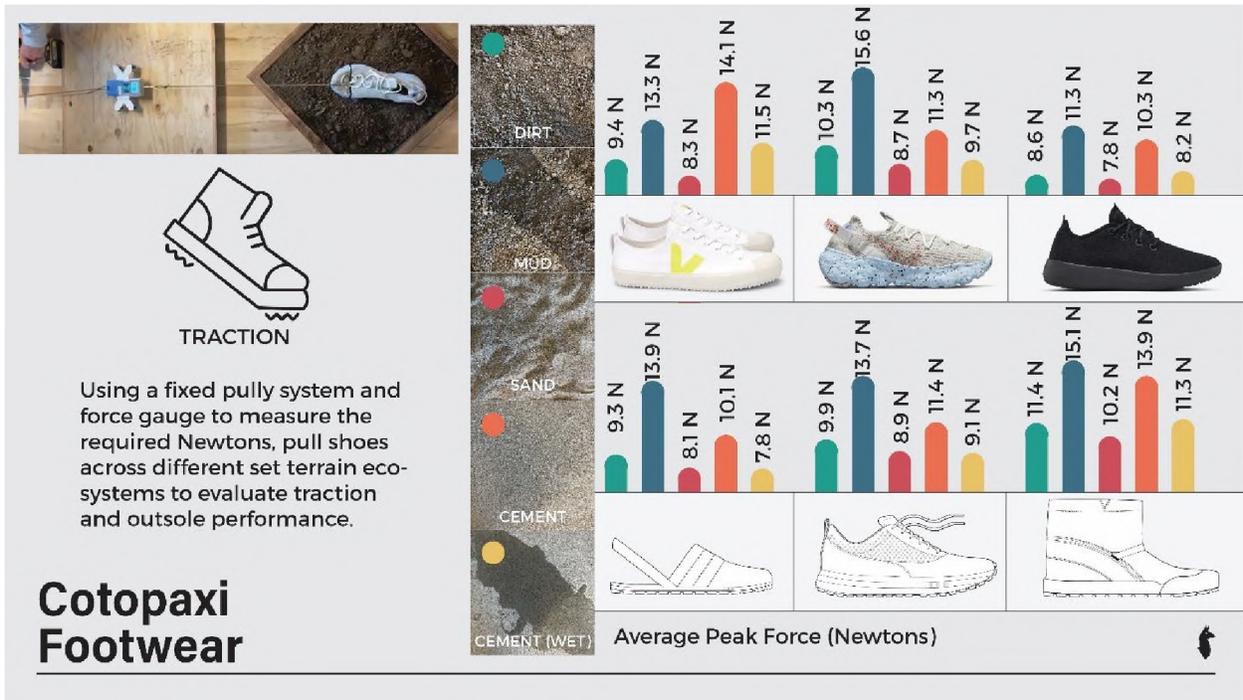


SEATTLE
REMNANT

Features & Benefits

- Water resistant Luzon bag material for weather protection
- Adjustable cross-instep strap for foot lock-down
- Cinch boot top for weather protection and secure fit
- Lugged traction pattern for multi-directional propulsion and grip
- Extended rubber foxing for toe protection
- Lateral and medial foxing flex groove to encourage flex in break zone







BREATHABILITY

Using fog machine to run vapor through shoe upper and watch for areas where vapor comes out of shoe. How long does it take? How much vapor is there?

0:13 (Min : Sec)
Vapor Level: HIGH



1:17 (Min : Sec)
Vapor Level: MEDIUM



UOSPD 2022

Cotopaxi Footwear

Gear For Good
Sustainability - Inclusion



WATER RESISTANCE

Attach shoe to base of transparent tub. Insert insole with hydrochromic stickers. Pour water in tub above midsole of shoe and watch for time it takes to seep through upper and change dot color. Weigh shoe after 3 minutes.

70% Dots Wet
361 Grams



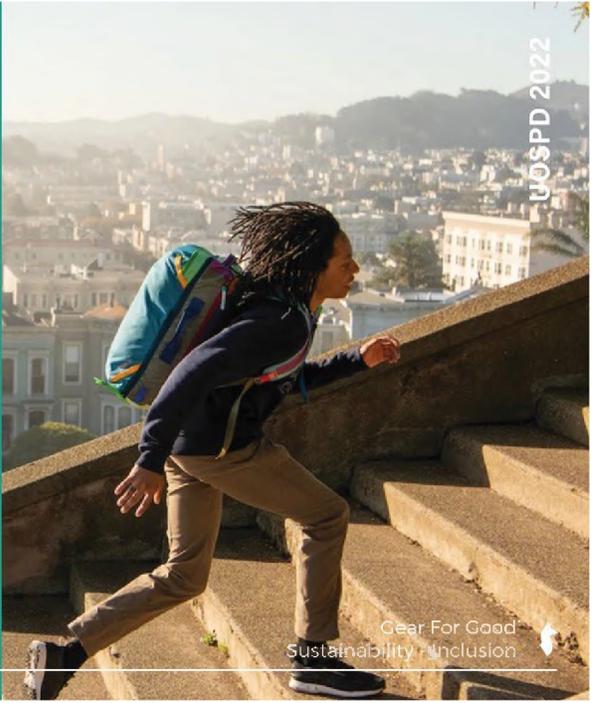
UOSPD 2022

Cotopaxi Footwear

Gear For Good
Sustainability - Inclusion

Final Materials
Unified Design Cues
Test Reflection
Communicate Supply Chain
Sustainability Improvements

**Cotopaxi
Footwear**



Trainer Sample Update

Sandal Sample Update

UOSPD 2022

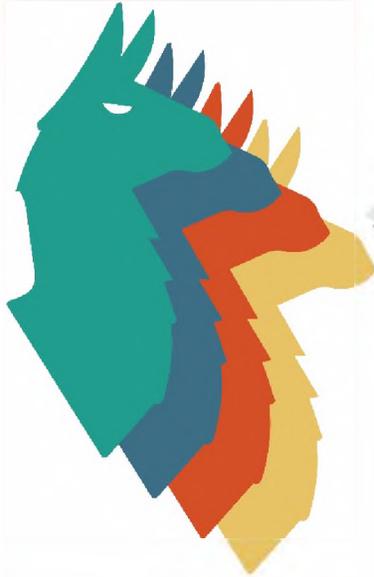
**Cotopaxi
Footwear**

Gear For Good
Sustainability - Inclusion

SENDERO FOOTWEAR

DOUG HINTZE

How can we create a sustainable line of entry-level outdoor hiking and travel footwear for Cotopaxi while achieving necessary performance for the outdoors [flexibility, weight, water resistance, breathability]?



LLAMA EXPERTS WAY IN

COTOPAXI EMPLOYEE INTERVIEW HIGHLIGHTS

"CASUAL HIKE - TRAVEL - EVERYDAY WEAR"

"Functional/Casual"

"Wanderwear"

"Cotopaxi product should be multifunctional and not made for one specific sport"

"FAIR TRADE"

"ENTRY-LEVEL or CASUAL hiking is the most important category"

"Casual outdoor sneakers would fit the Cotopaxi customers"

"Avoid the color BROWN and too much red"

"Cotopaxi's main goal is to create products that are inclusive and get people outside"

BASELINE PRODUCT TESTING - SUSTAINABLE SHOES



FLEXIBILITY

Clamp shoe at forefoot and use force gauge to study force need in flexion. (Averaged number after 5 tests of R & L shoe each)

-23.5 Newtons



-33.4 Newtons



-38.5 Newtons



WATER RESISTANCE

Attach shoe to base of transparent tub. Insert insole with hydrochromic stickers. Pour water in tub above midsole of shoe and watch for time it takes to seep through upper and change dot color. Weigh shoe after 3 minutes.

0:45 (Min : Sec)
All Dots Wet
440 Grams



0:13 (Min : Sec)
All Dots Wet
479 Grams



N/A (Min : Sec)
No Dots Wet
375 Grams



BREATHABILITY

Using fog machine to run vapor through shoe upper and watch for areas where vapor comes out of shoe. How long does it take? How much vapor is there?

2:22 (Min : Sec)
Vapor Level: Medium



N/A (Min : Sec)
Vapor Level: Low/None



0:45 (Min : Sec)
Vapor Level: Low



WEIGHT

Using a scale set to Grams measure the entire weight of shoe and tooling. Shoes dry with unaltered appearance.

348 Grams



346 Grams



370 Grams



UNIVERSITY OF OREGON

College of Design

Sports Product Design MS

SPD 688

Winter 2022

SECTION #3: SPRING TERM

The following slides are an outline of the work that was accomplished during the Spring term of the year 2022. Topics covered throughout the term focused on user product testing, physical prototyping, design process, product validation, technology validation and commercialization and final product implementation. This outline was presented for review at the end of the Spring term.

SENDERO

(Re)Purpose

 **COTOPAXI FOOTWEAR COLLECTION**
UO SPORTS PRODUCT DESIGN CAPSTONE THESIS - DOUG HINTZE



(Re)

HEY FRIEND!

FOOTWEAR
SUSTAINABILITY
OUTDOORS







WHY THIS IS IMPORTANT?



SUSTAINABILITY



INCLUSION



DO GOOD



ADVENTURE





REMNANT

RECYCLED

RESPONSIBLE



WHAT IS THE QUESTIVAL?

EDUCATION - DO GOOD - ADVENTURE - 24 HOURS



QUESTIVAL
ADVENTURE RACE

ADVENTURE & CHILL

(Be)

DO GOOD.

DO GOOD.

DO GOOD.



WHAT DO THESE ATHLETES NEED?



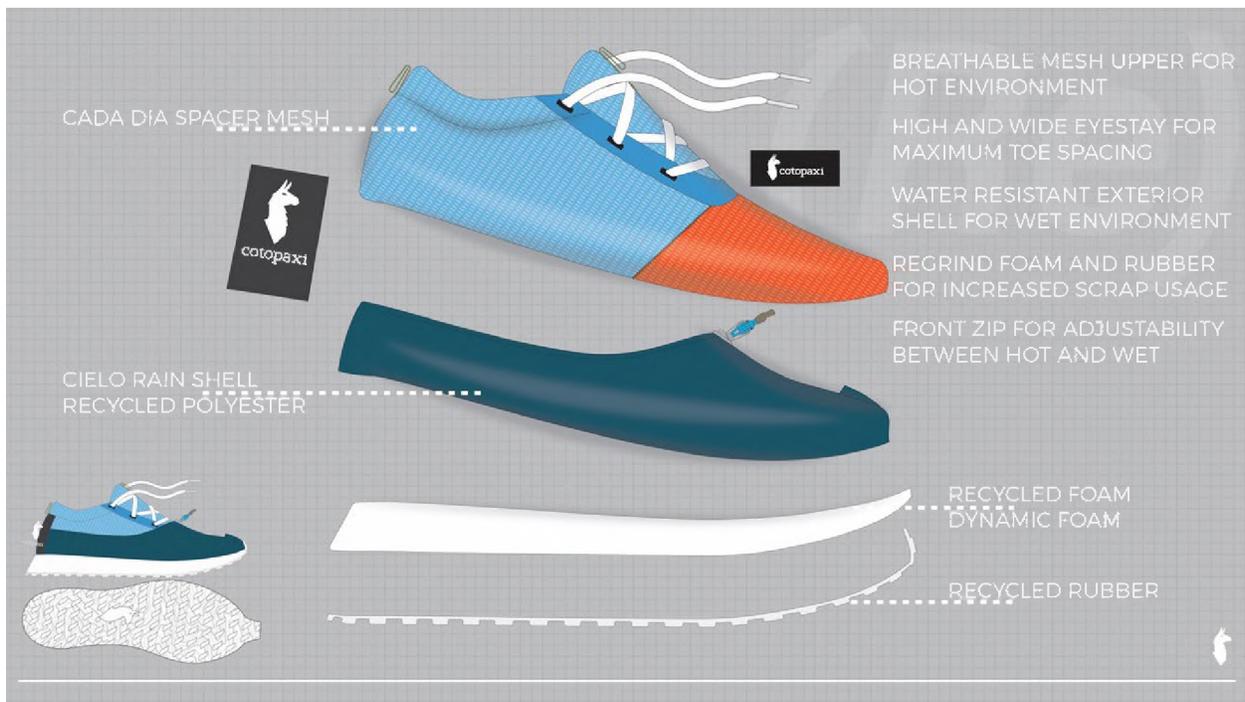
(Re)

HOW CAN WE CREATE A SUSTAINABLE LINE OF ENTRY-LEVEL OUTDOOR HIKING AND TRAVEL FOOTWEAR FOR COTOPAXI WHILE ACHIEVING NECESSARY PERFORMANCE FOR THE OUTDOORS?

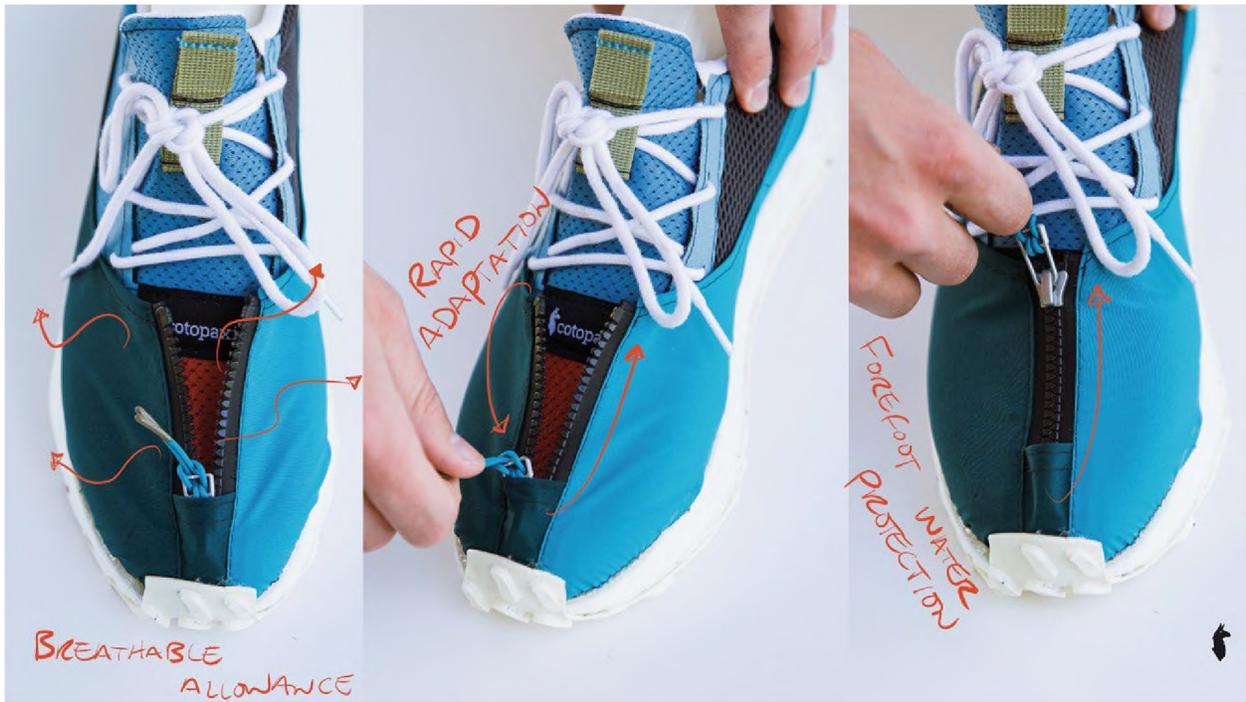






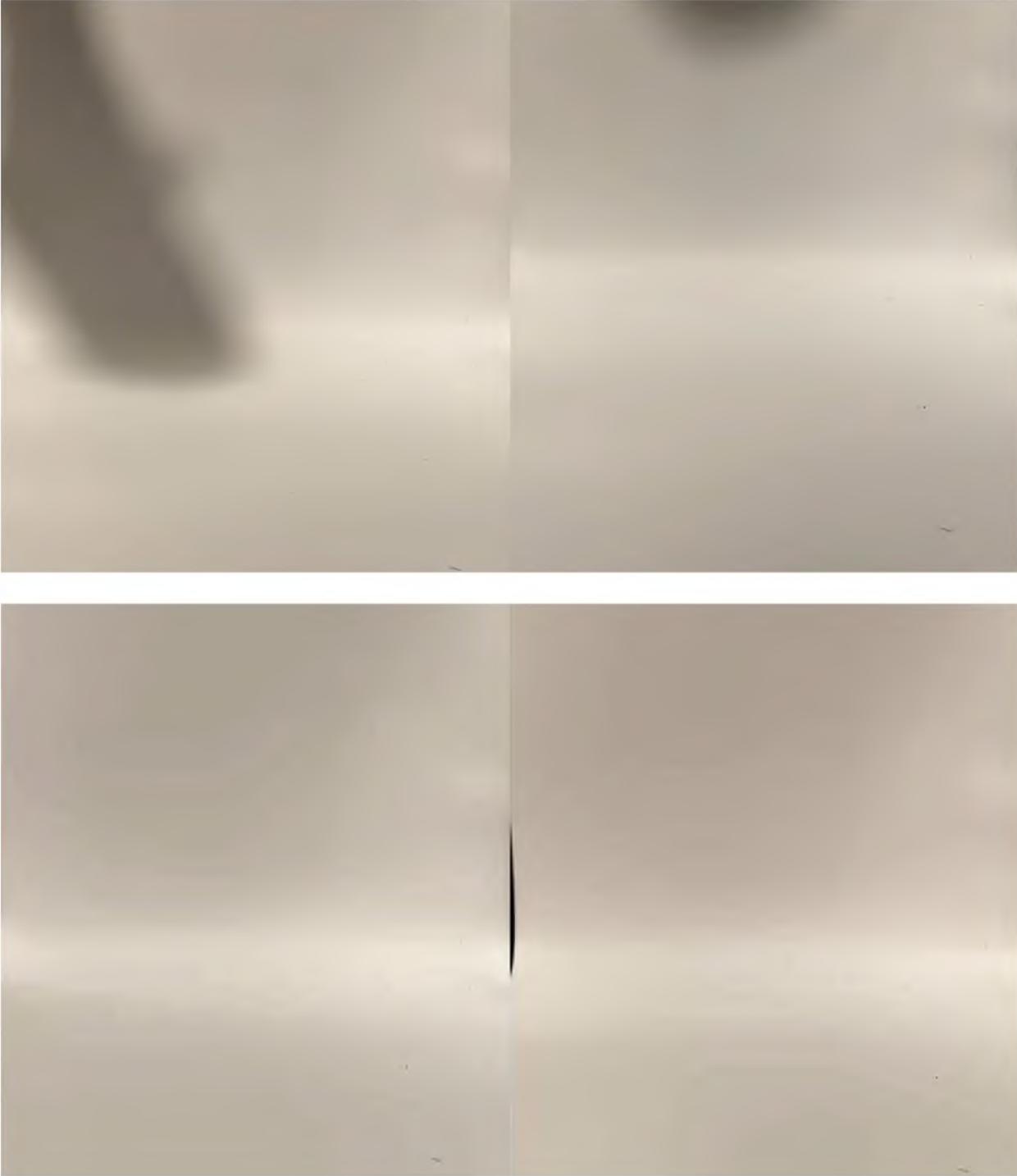


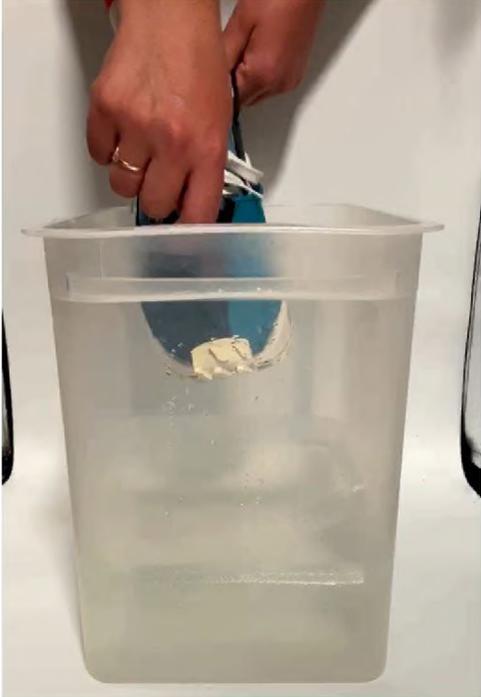












**EXECUTION
SUSTAINABILITY
FEASIBILITY**



