University of Oregon

Sustainable Footwear

Design For America
# Student Sustainability Fund

## Proposal Cover Form

<table>
<thead>
<tr>
<th>Project Title:</th>
<th>Sustainable Footwear for Low-Income Eugene Residents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total amount requested:</td>
<td>$2,500</td>
</tr>
<tr>
<td>Name(s) and Student ID number(s) of student(s) responsible for proposal:</td>
<td></td>
</tr>
<tr>
<td>Contact email address(es):</td>
<td></td>
</tr>
<tr>
<td>How many students are involved with the proposal?</td>
<td>6 Members</td>
</tr>
<tr>
<td>Student Group or UO Department/Program Index #:</td>
<td>Design for America</td>
</tr>
<tr>
<td>Department Budget Manager:</td>
<td></td>
</tr>
<tr>
<td>Budget Manager email address:</td>
<td></td>
</tr>
<tr>
<td>Project or event occurs on campus:</td>
<td>✓ Yes  ☐ No</td>
</tr>
<tr>
<td>Funding is requested for an allowable expense:</td>
<td>✓ Yes  ☐ No</td>
</tr>
<tr>
<td>Proposal includes completed itemized budget form:</td>
<td>✓ Yes  ☐ No</td>
</tr>
<tr>
<td>Proposal includes signed project approval form(s):</td>
<td>✓ Yes  ☐ No</td>
</tr>
</tbody>
</table>
# Student Sustainability Fund Itemized Budget

<table>
<thead>
<tr>
<th>Budget Item</th>
<th>Amount Needed</th>
<th>How You Calculated this Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prototype/idea supplies: Pens, Paper, Glue, sticky notes, mechanical tools</td>
<td>$ 400</td>
<td>$100 dollar budget increased from past implemented sustainability project prototype budget</td>
</tr>
<tr>
<td>Plastic samples, rubber samples, fabric samples</td>
<td>$ 1,000</td>
<td>Shipping prices, experimental material prices</td>
</tr>
<tr>
<td>Transportation: factory visits, supply pickup</td>
<td>$ 300</td>
<td>Large shoe industry in Portland, carpool group rides based off of gas prices.</td>
</tr>
<tr>
<td>Promotional Materials: flyers</td>
<td>$ 300</td>
<td>Increased budget on Fall 2015 limited printing expenses.</td>
</tr>
<tr>
<td>Manufacturing Supplies: Shoe laces, thread, sewing needles, foot-molds</td>
<td>$ 500</td>
<td>Allowing for multiple iterations of shoe designs, based off of shoe material prices.</td>
</tr>
<tr>
<td></td>
<td>$</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$</td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>$* 2,500</td>
<td></td>
</tr>
</tbody>
</table>

*The amount requested should not exceed $7,500.00.* If you need additional space to itemize expenses, please add rows and columns to the above.

## Other Funding Sources:

1) Funds for this project **secured** from other sources or held in organization reserves:

<table>
<thead>
<tr>
<th>Amount</th>
<th>Agency or Department Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>$100</td>
<td>Design for America: Fundraising/Fees</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2) Funding requests **pending** from other sources (campus groups, departments or community partners):

<table>
<thead>
<tr>
<th>Amount</th>
<th>Agency or Department Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>$1,000</td>
<td>Holden Center Grant</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
University of Oregon Student Sustainability Fund
Project Approval Form

Project: Sustainable Footwear for Low-Income Eugene Residents

Primary Contact: Isabel McDowall

By signing this form, I confirm that the project lead(s) has/have discussed this project with me, and that I (please check all that apply):

☐ approve the stated project to be conducted on the University of Oregon campus (this approval can only be given by campus units or by individuals on behalf of campus units) (REQUIRED)

☐ agree to be part of the project team

☐ will provide support to the project by being a partnering organization, department, or individual.

☐ am the administrator for my campus unit and agree to be responsible for the financial and human resources transactions associated with this project.

☐ agree to take over the operational costs of this project.

With the following stipulations (if applicable):

Budget money placed in Design for America's (DFA) budget fun requires sign-off by DFA Studio Leads Cara Murray, Amanda Kibbel, and KeeAnna Turner.

Name/Signature: Cara Murray , KeeAnna Turner, and Amanda Kibbel  Date: 3/2/2016

Title: Studio Leads

Department/Organization: Design For America

Phone: 503-619-9534  Email: cmurray5@uoregon.edu

Additional Notes: Cara Murray can be used the primary Studio Lead contact

Please save this completed form as “Project Contact Name_Project Name” and email it to uossc@uoregon.edu. The email originating directly from the approving body will be considered a signature. Paper copies may be sent through campus mail to Attn: Eric Beeler, EMU Student Sustainability Center Box or dropped off to the EMU Administrative Office and must include an original signature of the approving body.
Executive Summary

Through the student led group on campus, Design for America, our team is beginning a two term long project on sustainable footwear. The goal of this project is to collaborate as a team of students to ideate and prototype alternative green footwear solutions. An aspect of all DFA projects is to design for solutions relevant to the community using human centered design. This revolves around designing with the user in mind to be as best suited to their needs as possible.

Our team has identified an area within sustainability and footwear that not only helps to narrow the scope of the project, but has a user that would benefit greatly from our human centered design initiatives. We want to explore how we can make a low cost and low impact shoe made from up-cycled materials that is designed for the lower economic class. Focusing on lower income citizens, specifically in Eugene community, is an important demographic for sustainable footwear. Footwear is expensive, and that marketed as sustainable is especially so. This is where our design work and research comes into play. We are striving to find sustainable materials at a low cost paired with a low impact production process, made here in the community, to form a well designed, simple shoe.

By narrowing down our user to the low-income demographic, our team can further speculate what our footwear will need to encapsulate in order to achieve our goal. Other questions from this we will need to address are what materials to use, what production processes, the orthopedic and weather requirements of shoes are user necessitates.

Specific goals for this project range from our desired impact, exploring materials, production, and the perceptions our society has towards the lower economic class. As a group of students and those who will help shape the future, we recognize that it is our responsibility to help the earth and people who are unstable economically. We don’t believe it is feasible to
educate the community at large about sustainability. What is more reasonable is for us designers, scientist, and economists in the making to create a sustainable world that is available to everyone, not just the fortunate.

Plastics and rubber using fiber processes is the direction for production we have decided because it will allow us to potentially use existing waste and low impact materials and replicate existing footwear manufacturing processes. Nike Flyknit and Primeknit from Adidas have been an informative example as a high tech method for creating a strong shoe body using fewer materials. Reusing polymers that are recyclable themselves reduces the carbon footprint of the product. We can further lower our carbon footprint by producing and distributing the shoe locally, reducing transportation emissions.

Halfway through the term, the various DFA groups meet to present their projects for a studio critique. The purpose of this is to get constructive feedback from those who know the human centered design process. Peer review is one way we will measure our progress. Our team will also be measuring its progress using the Design for America process. The steps are Understand, Create, and Implement. At the end of each term, Design for America holds a final exposition where groups present their projects to our club peers and all of those in the community who attend the event.
Grant Proposal

This project is to be broken up into two terms. The first and current half will be spent researching our user and problem space, interviewing community partners, deciding our materials and production process. At this stage we can poise ourselves for prototyping and how distribution will happen. Spring term will be spent prototyping. If we have access to the materials necessary to go through the full design process, we will not only prototype, but make improvements and create a finalized product. This is our ideal end goal. With the nature of design, we may end our project with multiple iterations of our first prototype so we do not produce a product that does not meet the consumer value.

Our main metric for success, the Design for America structure, Understand, Create, and Implement, will be the guideline for our project. The Understand portion, which we are currently in, has three stages. First is to researching and identifying a problem space. Then we immerse in the problem space with field work, interviews and finding our community partner. Using our research insights, we can reframe the problem.

Create, the second phase, will come weeks 7 and 8 of winter term. The steps are ideation brainstorming and narrowing to 1-3 final concepts. Then comes building our ideas from concepts to fleshed out proposals. Finally, we will know what to test for, conduct such tests, and learn from the feedback we receive to move us forwards toward our goals. These problems will include how materials react in the Eugene climate, the daily mobile and foot needs of our user, and other problems we identify in our research.

Implementation will span all of spring term where we will be working towards our biggest goal of producing a working prototype to present at the spring DFA exposition on the at
the end of spring term. The process will start with defining our implementation scale and the
time commitment to implementing as a project team. Next is to take the resources gathered from
the Understand phase from expert opinions, materials, and manufacturing, to realize our solution
and follow through with our implementation approach. Once we begin prototyping and know the
breadth and span our project is capable of achieving with our user and production capabilities,
we can determine our solution’s lifespan.

Being in the Understand phase of the project, we are conducting expert interviews and
exploring how to break down our implicit biases when it comes to our user. Currently, we are in
contact with John Frazier who is has been both the Sustainable Chemistry Director and GM
Chemistry of the Nike Explore Team in Portland, Oregon. An on campus connection we have is
Julie Haack, professor Assistant Department Head of the Chemistry department at the University
of Oregon. Further collaborations will be done with various homeless service institutions such as
St. Vincent de Paul and Sheltercare for in-person and over the phone interviews. Other research
on green technology, materials, production, ethics, economy, trends in footwear, and re-
purposing are the focus. Once we gather all of the data and expert opinions, ideation will begin.
The project will evolve from loose ideas to a formalized project. By week 8 of winter term we
will have the concept finalized and plans to obtain the means of producing it. Week 9 is the
Design for America winter exposition.

Strength of DFA projects is the stress put on narrowing the project space. With the short
time span we have, this allows us to produce a project via human centered design intently
focused on the user in question, resulting not in a vague design, but a uniquely specific one.
Low-income Eugene citizens are our concentration because the podiatric needs of this population
go largely unrecognized. An editorial titled, *Foot Problems in Homeless Persons*, by Keith
Wrenn, MD states, “Foot problems represent a relatively large proportion of complaints (up to 20%) among homeless persons…Ill-fitting or worn-out shoes may cause blisters, chronic heel pain, Achilles tendon disorders, plantar fasciitis, chronic metatarsalgia…” and many more medical complications (Wrenn, 567). Mobility is a human right. The homeless and impoverished of Eugene can be given more in terms of footwear. What are available now are purely donations of predominately reused footwear. This is an unsuitable condition for people to be enduring given their lifestyles may be highly mobile and need to deal with the high precipitation and temperature fluxes of the Eugene area. This is why our team has pinpointed our problem space to this user.

Green chemistry is a huge focus for this project because backing our decisions with sound science is crucial for designing a truly sustainable product. Having seen what is commonly used in footwear, the high tech processes, and examining the lifecycle analysis of several materials, we narrowed down our selection. Rubber, plastic, and fiber processes are the frameworks for our footwear production. Our community partner, John Frazier, who has dealt with choosing green materials for footwear fabrication, will be able to inform us of the ideal polymers from existing products based on their chemistry and are the most sustainable and ideal for reuse. We have already selected high-density polyethylene for its combination of toughness, stiffness and resistance to environmental stresses. It is one of the most recycled plastics to date making it an easily accessible material that is in products everywhere.

Production we researched is the Nike Flyknit and Primeknit from Adidas. Nike does computerized knitting for the entire upper shoe, reducing what are normally 35 sections into one. Kathleen O’Brien did a report on these two innovative processes for Nation Swell. Her overview on Nike Flyknits notes that, “…the production of knitted shoes results in 80 percent less waste.
That’s because when working with yarn, only an exact amount is used. Then, the thread is cut and the rest of the yarn can be used to make another shoe. The technique isn’t limited to one type of fiber, either. Anything that can be made into a yarn – carbon, wool, Kevlar, gold and stainless steel – can be used to make these shoes” (O’Brien, 1). Adidas’ process is much the same, yet they are able knit in different patterns to form distinct upper shoe shape from the Flyknit. The competition and innovation between these shoe behemoths and flexibility in the technology demonstrates to our team that there is room in the process for us to replicate it in our own manner.

Connecting the Flyknit and Primeknit procedures to green chemistry, we decided that in conjunction with our sustainability initiative is to primarily repurpose existing objects as the material basis of our shoes. It has been shown by Nike and Adidas that a well-made, low impact shoe is possible with an endless variety of materials. As long as our knitting material can be formed into a long strand akin to the yarn, then we have a plethora of design possibilities. Jennifer Chu at the MIT New Office found that, “…more than two-thirds of a running shoe’s carbon impact can come from manufacturing processes, with a smaller percentage arising from acquiring or extracting raw materials…A typical pair of running shoes generates 30 pounds of carbon dioxide emissions, equivalent to keeping a 100-watt light bulb on for one week” (Chu, 1). A great amount of the waste this life-cycle assessment also noted was the bulk material needing to be thermoformed, cut into shape, and thus discarding the scraps. If we keep our production local and take raw resources out of the equation, then we will greatly reduce the carbon footprint in the creation process.

We have formed our market plan around the constraints of design possibilities and our users. Our value proposition to the consumer, low-income citizens in Eugene, is to provide
comfortable and affordable footwear that satisfies their mobility and weather needs. Going with a linear marketing plan process, we will start with production concept, product, selling, marketing, then societal concept. For production, we stuck to the long-standing fact that consumers will favor products that are available and highly affordable. That is why the primary focus for us is not to educate the general public on sustainability, but to design our low impact shoes to be cheap and the benefits to speak for themselves. Product concept means that consumers naturally prefer a quality item that performs. For footwear, this is especially so. How to be as sustainable as possible is to produce as little of the product you can. This is why we are investing the most money and time into our prototyping phase. If we are able to put most of our resources into designing a shoe through extensive R&D, we will inevitably end up with a superior product. The selling concept means that for a product to be consumed, promotion must go underway. We put aside money in the budget proposal for promotion. We will have word of mouth and social media presence because of the DFA media team. Our marketing concept is how we plan on getting our product from production to consumer. With transportation money we can get our supplies, travel to Portland, Oregon, collaborate with our community partners, and package our materials and product to transfer them to the consumer. Lastly is the societal marketing concept. This project, every step of the way, is pivoted on improving the mobility situation of the low income in Eugene. Not only that but we are striving to do this responsibly thinking in the long term. Human equality through sustainable design by investing in high tech design processes and materials is our marketing plan.

With the help of this grant money, this team of students will better be able to innovate and design for the benefit of the impoverished in Eugene. We have many connections in place, but a design project cannot be fully realized by minds alone. Innovation, prototyping, and
production is a process of many trials and errors. The Sustainable Footwear team needs materials for this process to occur. We have the ideas and academic resources to speculate an inspiring concept, now all we need is the physical materials to create this project.
References


"How a New Technique Is Changing the Way Sneakers Are Made." NationSwell How a


Wrenn, Keith, MD. "Foot Problems in Homeless Persons." University of