

# EARTH PACT R5 REPORT

## TEAM PLANETEERS

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## EXECUTIVE SUMMARY

EarthPact seeks to engage people in learning about their environmental footprint and prompt them to change their ways to reduce their ecological footprint. There are 5 physical, educational, and interactive exhibits, one for each topic area of the ecological footprint: food, shelter, mobility, goods, and services. EarthPact SF's exhibits are located in Justin Herman Plaza in San Francisco, California and the exhibits also serve to activate the plaza, which is currently a ghost space most of the time.

In addition to the series of exhibits, there's an EarthPact app that people log into to track their footprint scores at each of the 5 stations. Each exhibit ties in a pledge to get participants to commit to change their behavior. The app allows people to complete the exhibits in one or multiple visits, track changes over time, receive reminders about their commitment to change, receive tips on how to lead a more sustainable lifestyle, and serve as a way to track metrics and see the collective impact of people's behavior changes.

# RESEARCH

## SUMMARY OF RESEARCH

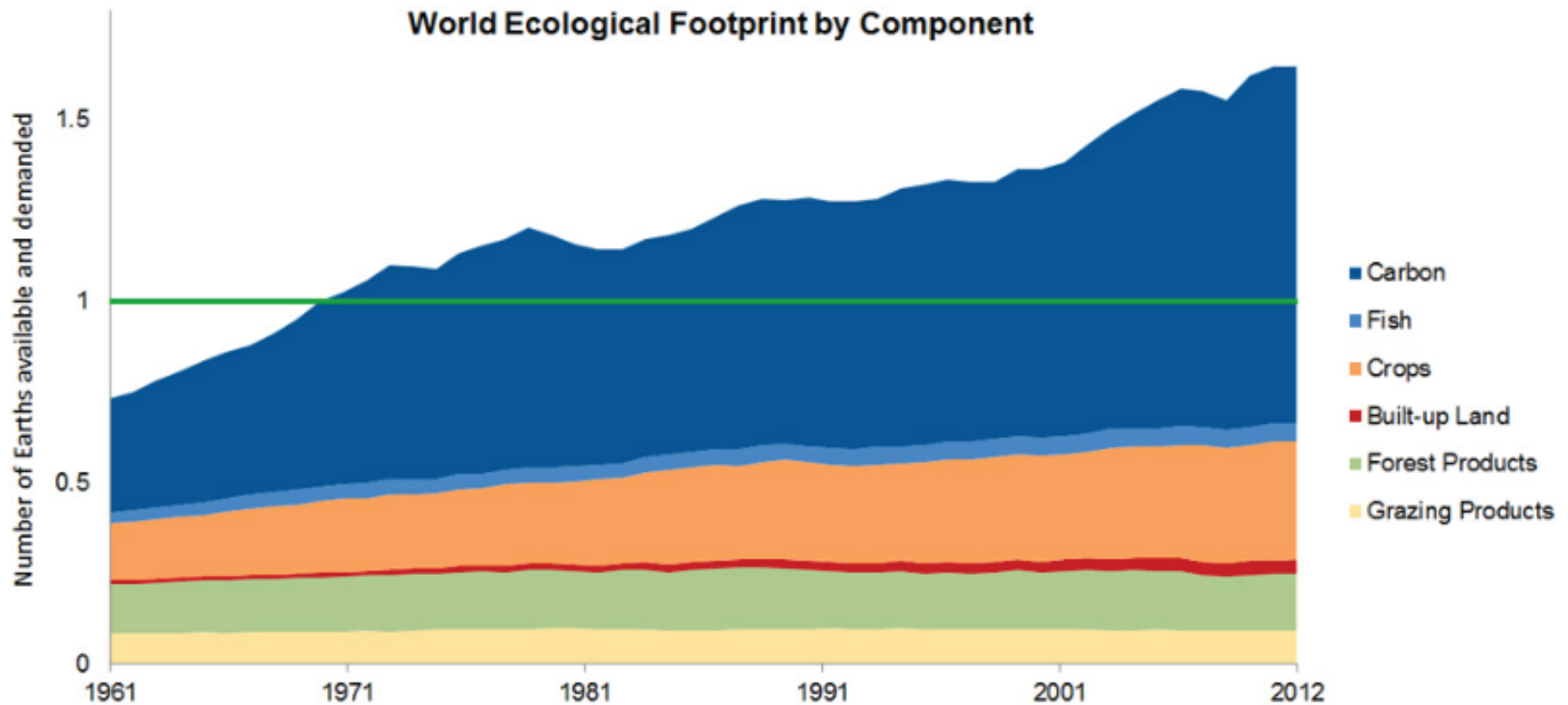
Our primary research methods included stakeholder interviews, expert interviews, observations, and online surveys. We also conducted secondary research. From our research, we discovered a few key findings:

- The U.S. has the largest carbon footprint in relation to population and compared to other countries
- Americans are unaware of their environmental impact
- Interactive exhibits are engaging and effective tools for learning
- People are more likely to change their behavior if they know the specific actions they can take, have short-term goals, receive feedback, and have a support network.

See Appendix for additional research.

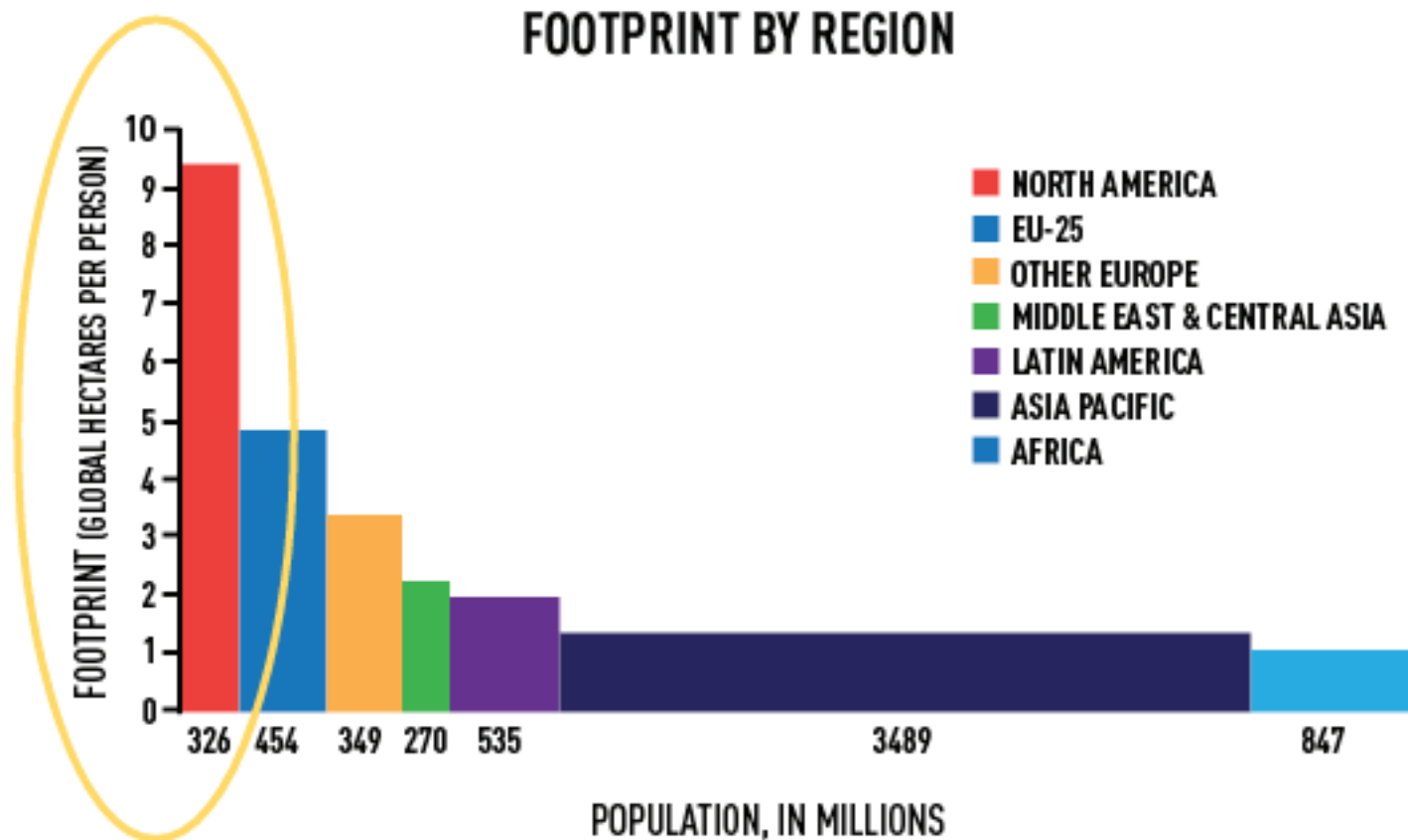
## RESEARCH – U.S. CARBON FOOTPRINT

This chart shows the numbers of Earth's available and demanded from 1961 to 2012. The green line shows the one earth that we have. The demand has been higher than what we have (1 earth) since 1971, and it still trends upward.



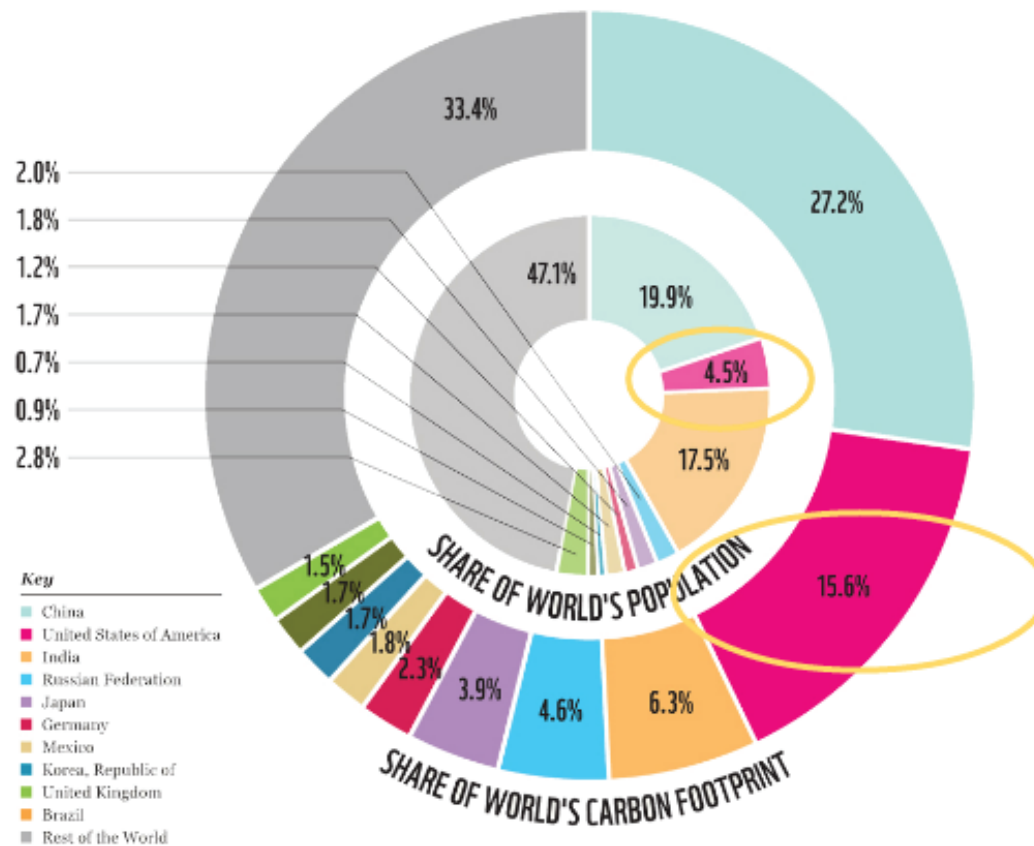
## RESEARCH – U.S. CARBON FOOTPRINT (CONTINUED)

This chart shows the average personal negative impact to the earth in different regions. North Americans are making the biggest negative impact per person. Their impact is twice more than the next closest region.

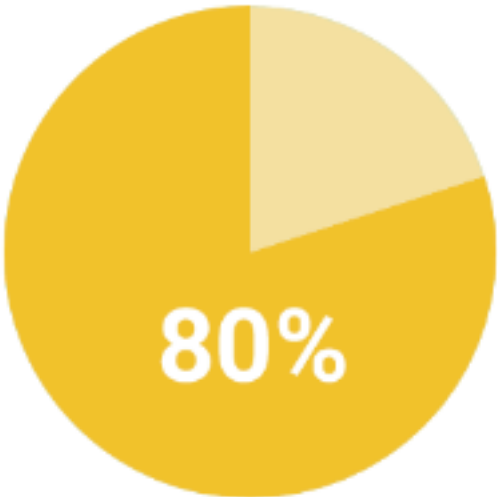


## RESEARCH – U.S. CARBON FOOTPRINT (CONTINUED)

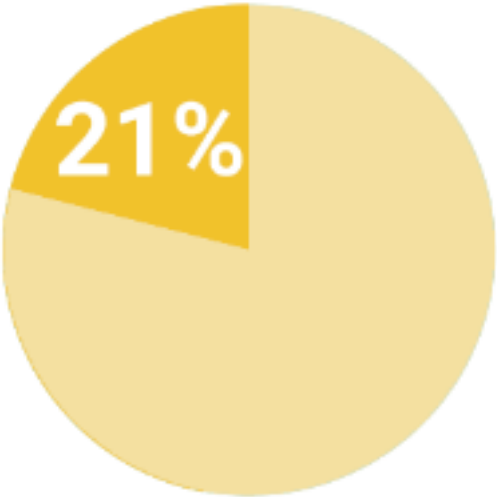
This chart shows that about 16% share of world's carbon footprint is created by Americans, which is the second biggest footprint by a country. However, the U.S. population is only about 5% of the world's population, which means for each person, Americans are creating more environmental impact than others.



# RESEARCH – LACK OF AWARENESS OF ENVIRONMENTAL IMPACT



of respondents were unaware of their environmental footprints



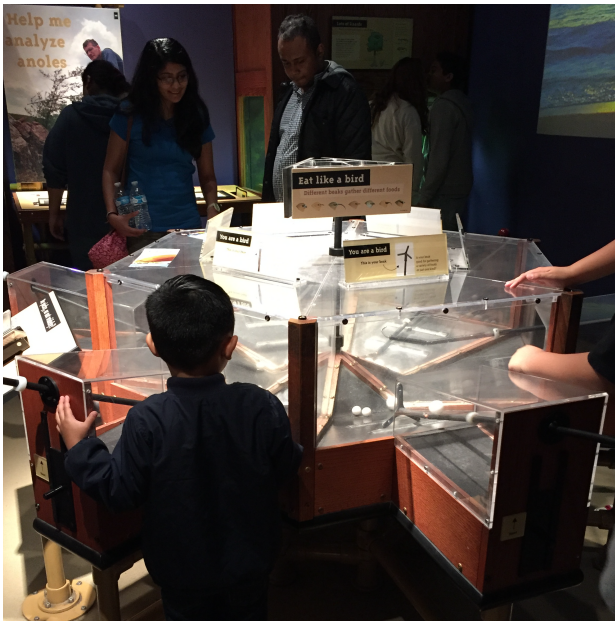
of Americans feel guilty



Americans ranked last in sustainable behavior, as they have every year since 2008

## RESEARCH – INTERACTIVE EXHIBITS ARE ENGAGING & EFFECTIVE

By observing and interviewing stakeholders at the California Academy of Sciences and the California Science Center, we found that exhibits involving challenges and an opportunity to interact were far more popular than information-based exhibits. When presented with a challenging activity, we observed that people spent more time and were more engaged in those exhibits.



Interactive Exhibits at California Science Center in Los Angeles, CA



# RESEARCH – INTERACTIVE EXHIBITS ARE ENGAGING & EFFECTIVE

## Active Learning

People learn more deeply and retain knowledge longer when they have opportunities to engage actively with the information and experiences at hand, even if these opportunities are punctuated with moments of passive receptivity.

When people have some degree of personal agency – some range of choice about the shape and direction of their own learning activities – learning tends to be more meaningful and robust.

In art museums, active learning and personal agency are natural partners. When we're in charge of our own learning, we often do find opportunities to engage our minds, especially in environments rich with evocative objects and experiences.

To achieve both visitor attention and communication, exhibitions need goal-directed and discovery activities (e.g., making predictions, completing a task, resolving a question) that reward appropriate attention. The goal is that visitors use exhibition content as the framework for the learning activities. Visitors must operate a dial, compare two events, look for answers to a question, etc.

In other words, the positive results from attending and doing sustain this attention. Such natural (intrinsic) rewards can take many forms, but can include such simple things as completion of a task, achieving a prescribed score or performance level, or successfully predicting an event.

# RESEARCH – BEHAVIOR CHANGE

From our research, we discovered several key factors for inciting behavior change.

## **Information**

- Knowing why
- Knowing consequences of action & inaction
- Knowing how

## **Suggest Change**

Formulating daily short-term goals will ultimately lead to long-term success and help people remember their goals. The more active a goal, the bigger the influence there will be on behavior.

## **Give the Right Feedback**

Feedback can influence the mindset people adopt about behavior and motivation. It is better to give positive feedback. Positive feedback helps make people more committed to a goal. Negative feedback is particularly good for spurring people to make more progress.

When people are first starting to change their behavior, positive feedback helps generate and reinforce a greater sense of commitment toward the goal.

# RESEARCH – BEHAVIOR CHANGE (CONTINUED)

## **Support Good Behavior**

People want to minimize both the amount of time spent thinking about their behavior and the amount of effort required to act. Make desirable behaviors as easy as possible to perform. You can influence people to perform an action often enough that they acquire a habit.

## **Develop Support Networks**

Generating communities around a process is an efficient way of engaging people to change their behavior. Social relationships are a critical part of behavior change—and conversations are a critical part of relationships.

Recipe for a successful support community:

- Find a process that engages a group of people.
- Focus on creating a neighborhood around that process.
- Add experts who can give people good advice to help them achieve their goals.

## RESEARCH – BEHAVIOR CHANGE (CONTINUED)

We also researched how awareness of one's ecological footprint can lead to behavior change. The ecological footprint calculator has been used at universities. The Global Footprint Network received the following feedback on how it feels to use it and how it impacts behavior.

**“It is a really engaging way for students to measure their consumption of resources. It’s a very clear and simple way of communicating a complex concept—that also presents solutions too!”**

*- Kirsten Balding at RMIT University in Melbourne, Australia*

**“Especially at the end when the program gives you different suggestions on how you can improve your Footprint. Maybe if we got together and collaborated among our different communities, we could come up with more ways to reduce our Footprint as a whole along with ways to improve one’s personal impact.”**

*- Amanda M. Onley-Willette, Student at Midlands Technical College*

**PROBLEM**

## PROBLEM STATEMENT

**How might we impactfully engage people in learning about their environmental impact, to prompt behavioral change?**

**SOLUTION**

## EARTH PACT

Our solution concept, EarthPact, consists of a series of interactive exhibits, that help to inform people about, help to track, and ultimately help to reduce people's Ecological Footprints. EarthPact, consists of 5 exhibits located in Justin Herman Plaza. Each exhibit corresponds to one of the 5 sections of the Ecological Footprint: Food, Shelter, Mobility, Goods and Services.

The exhibits are tied to the EarthPact App which users can download for free and use to track their scores for each exhibit. Once they complete the activity and leave the exhibit they will get their score, receive tips on how they can reduce their footprint, and be able to make a pledge to take a particular action (i.e. "Meatless Mondays"). In addition, they can track their progress, get push notifications and reminders about their pledges, share their scores and commitments on social media, and compare their footprints with their friends via a leaderboard. Through these features, users will be more likely to stick with their pledges. Also, the data from the App will allow us to measure how successfully EarthPact has impacted people's behavior.



EARTH PACT



# STAKEHOLDERS



Adults



Cities



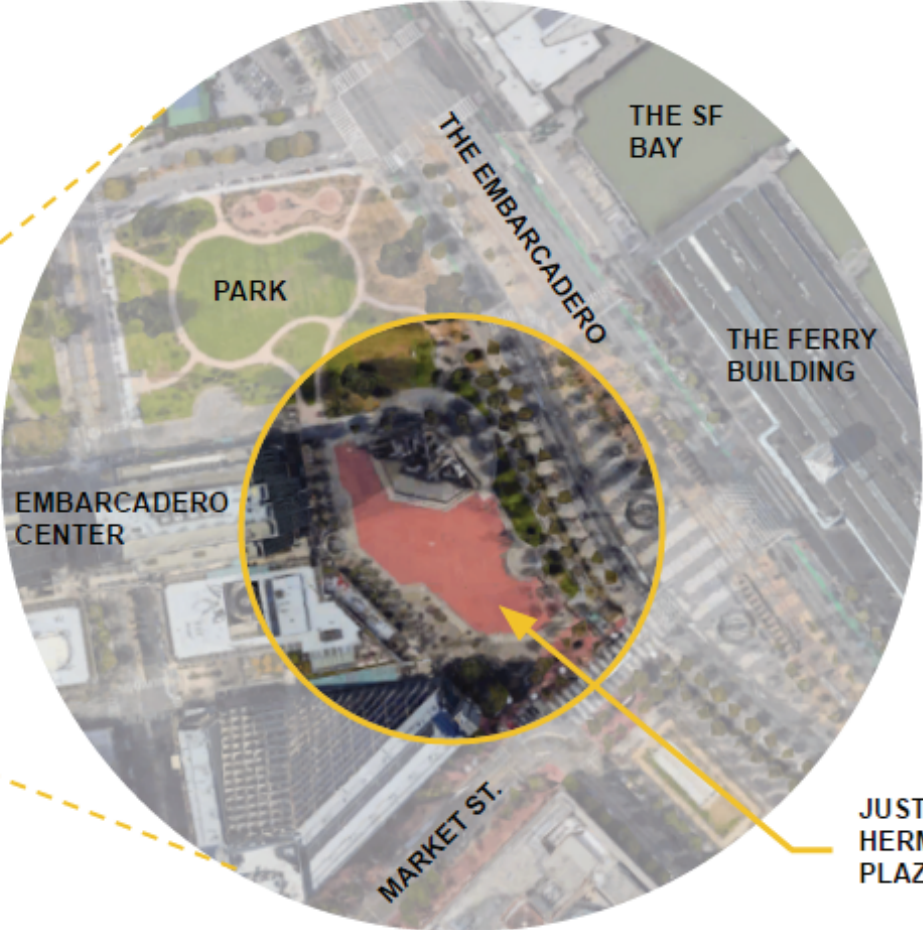
Partners

## Partners/Sponsors Include:

- C40 Cities
- Global Footprint Network
- Living Innovation Zones
- Mayor's Office of Civic Innovation
- SF Dept. of Public Works
- SF Dept. of the Environment

# (BETA) LOCATION

**JUSTIN HERMAN PLAZA**  
SAN FRANCISCO, CA



## JUSTIN HERMAN PLAZA

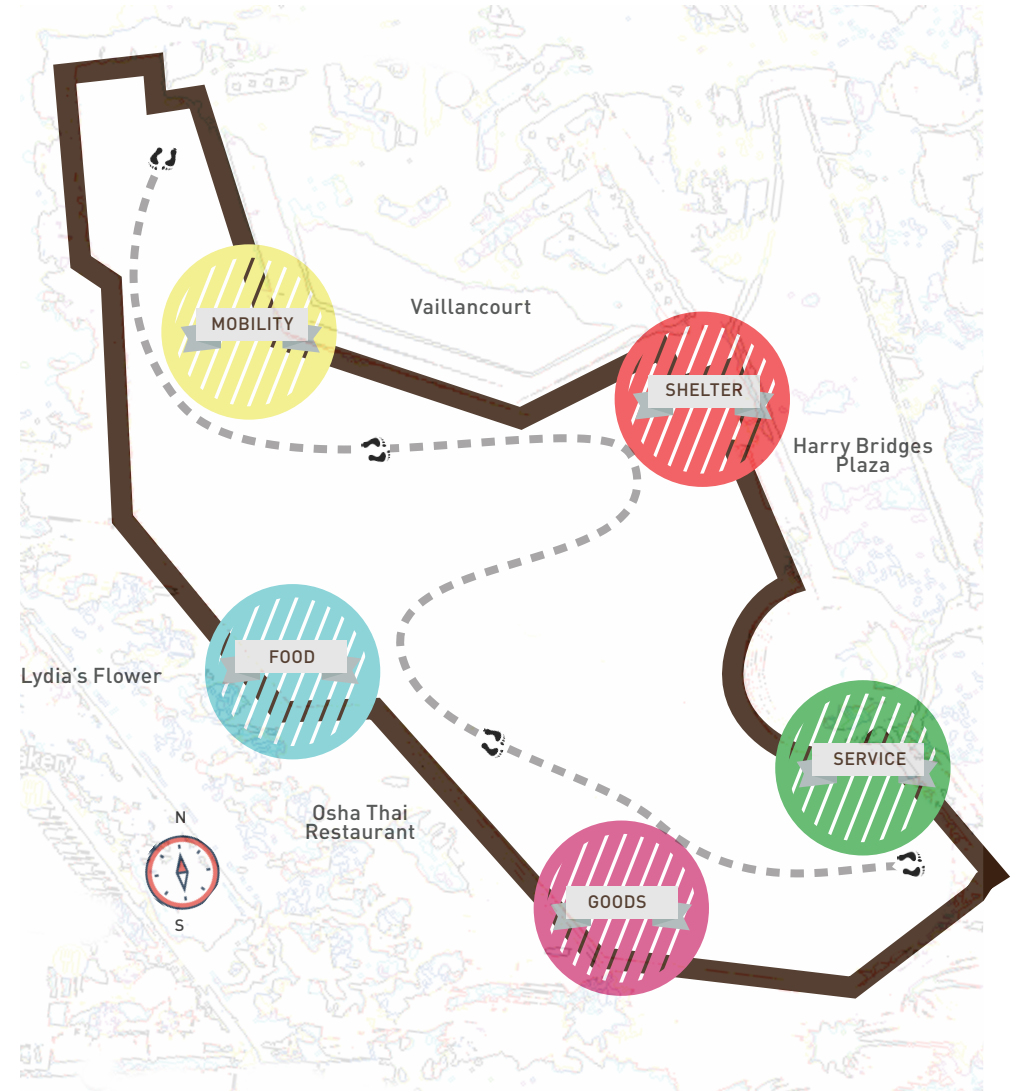
Justin Herman Plaza is the location for EarthPact SF because, despite its prime location, its abandoned most of the time. There are a few events that take place in the plaza, such as protests, walkathons, pop-up parties, and an ice-skating rink in the winter. The plaza is located near the Ferry Building, a park, Market Street, and The Embarcadero Center, so people are around it during the week and the weekend. We think that the exhibits will attract a lot of stakeholders in this location, as well as help to activate the space, almost solving two problems in one. *Our primary concern, however, is for people to learn about their environmental impact and to change their behavior to reduce their impact.*





## EXHIBIT LAYOUT

The EarthPact SF exhibits are laid out in Justin Herman Plaza as shown in the site plan to the right. People can complete one, some, or all of the exhibits in one visit, or they come back later because the app stores their scores for each exhibit.

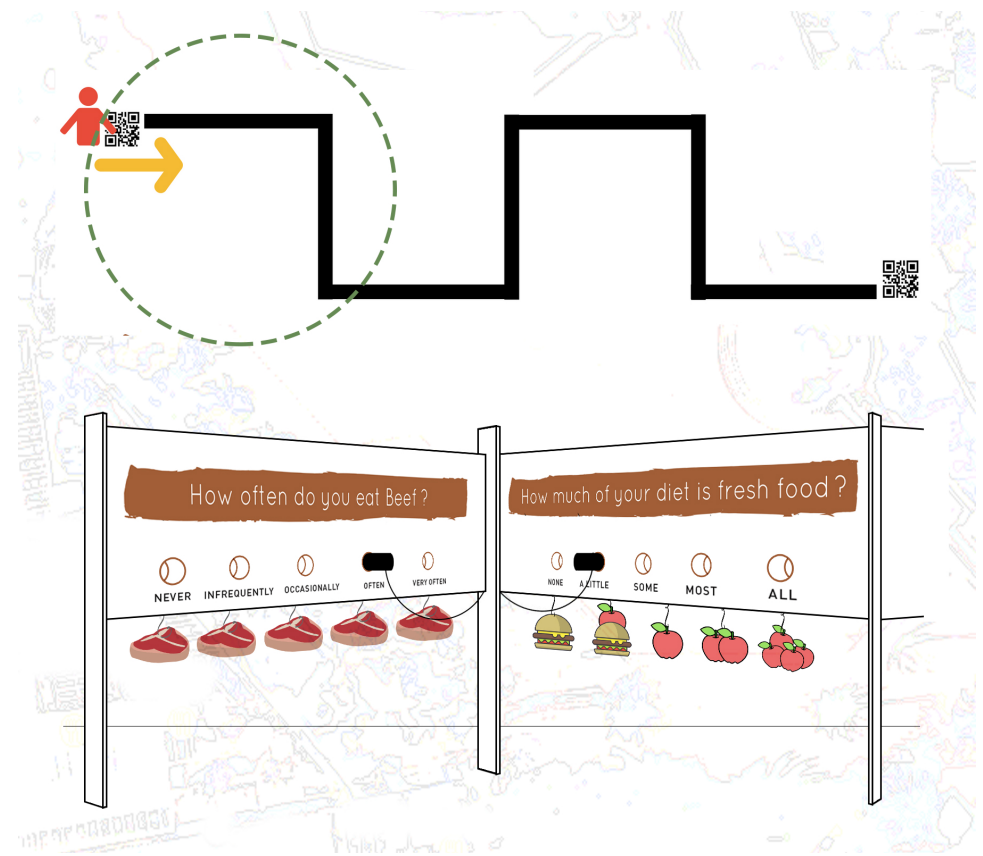


## EAT EXHIBIT

The EAT exhibit corresponds to the Food section of the Ecological Footprint Calculator. It helps people understand the impact their food habits have on the environment.

The participant scans the QR code to begin and then walks along the physical panels. They put pegs into the holes that correspond to their answers to the questions having to do with their food habits.

After answering all the questions, the participants scan the QR code with their phone and their answers to the questions are calculated to give them their impact score.

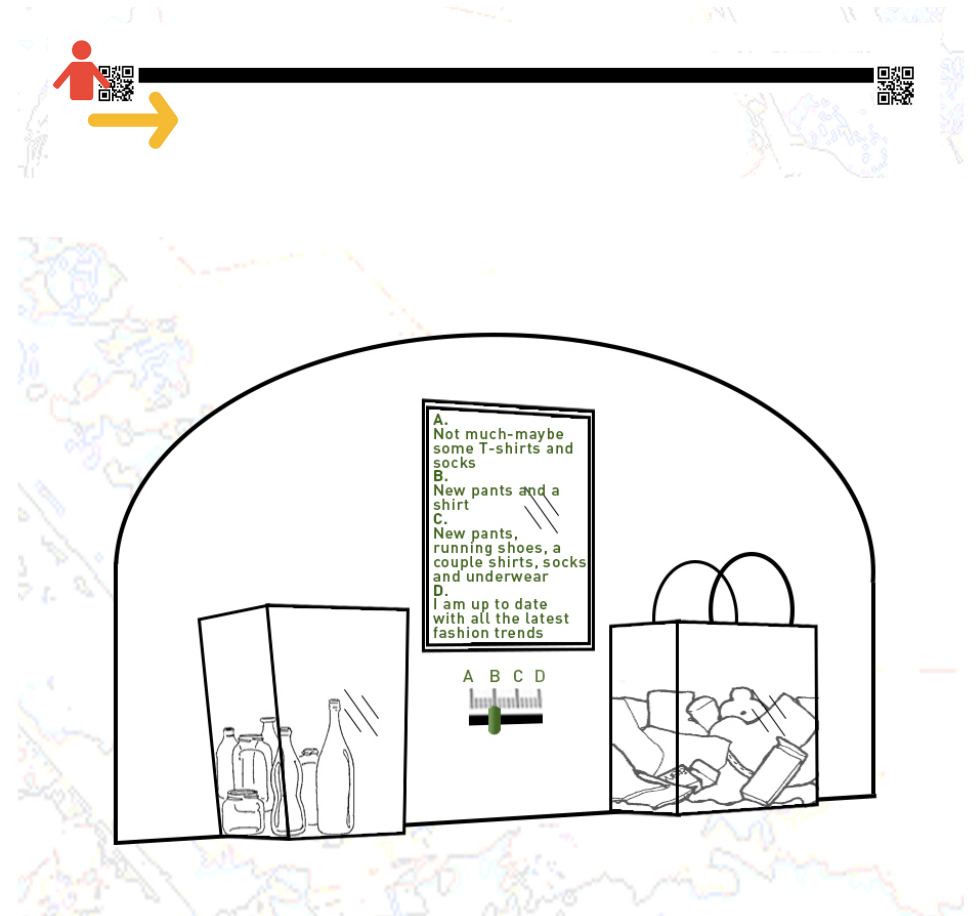


## BUY EXHIBIT

The BUY exhibit is based on the Goods section of the Ecological Footprint Calculator. It helps people understand the impact of their consumption and waste habits.

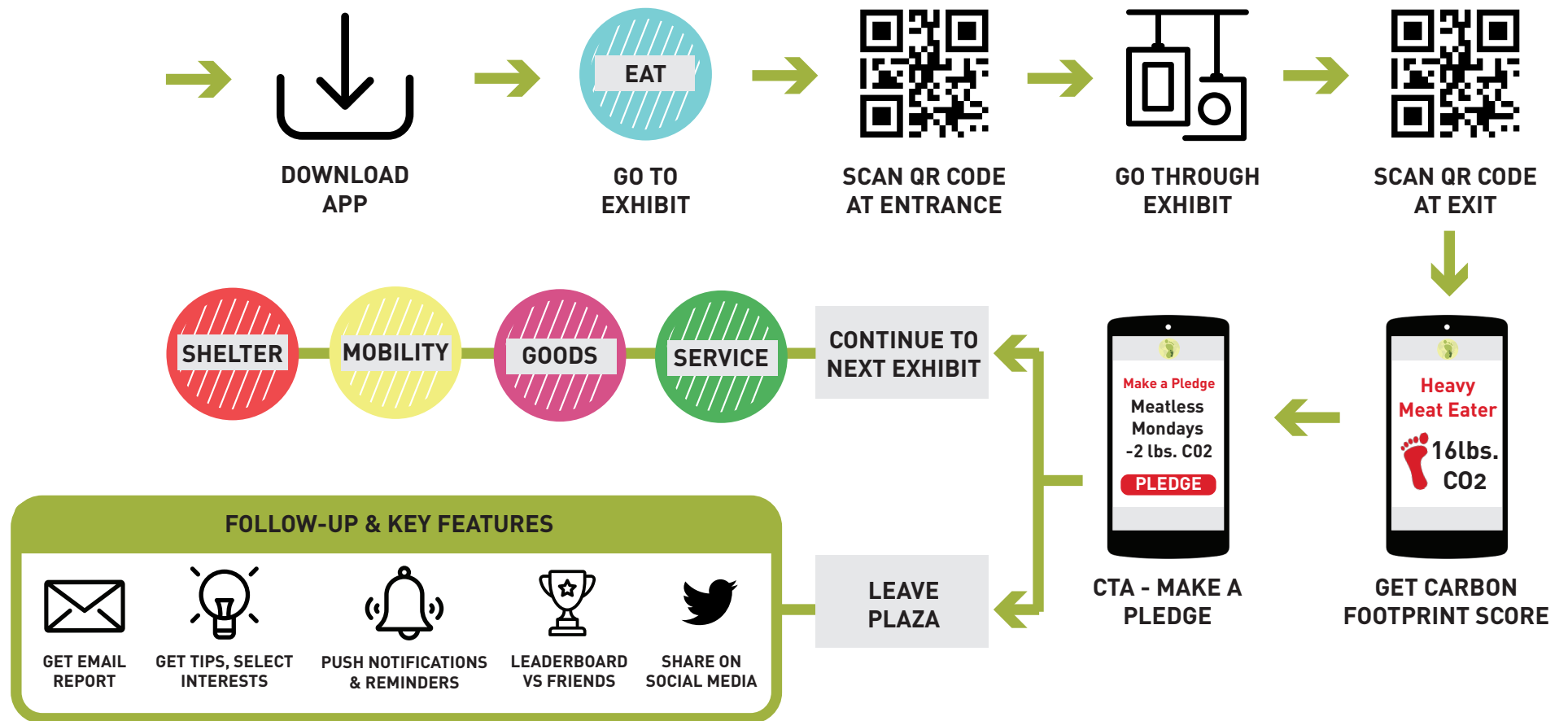
After scanning the QR code, the participant stands in front of a screen located between a LCD recycling bin and shopping bag. They touch the screen to view questions and the multiple-choice answers. They then slide the physical lever to align with the choice that correspond to their answer. When they here a ding, the answer has been recorded and they may move on to the next question.

After answering all the questions, the participant scans the QR code with their phone and their answers to the questions are calculated to give them their impact score.



# JOURNEY MAP

The journey map illustrates the participant journey through the EarthPact SF exhibits. It also shows the subsequent interactions participants have with the EarthPact App. The app helps participants to both better understand and reduce their impact after completing the exhibits.



# EARTH PACT OFFERINGS

EarthPact includes the following:

## EarthPact SF

- Physical Exhibits:
  - Interactive
  - Educational
  - Playful

## EarthPact App

- User Pact
  - Provides Footprint Score
  - Personal Tips to Reduce Impact
  - DIY Tips, Recipes, etc
  - Track Metrics
  - Rewards
  - Social Network Connection
  - Visualize Collective Impact
  - Advertisements for Events to Learn Sustainable Practices





## COMPETITIVE ASSESSMENT

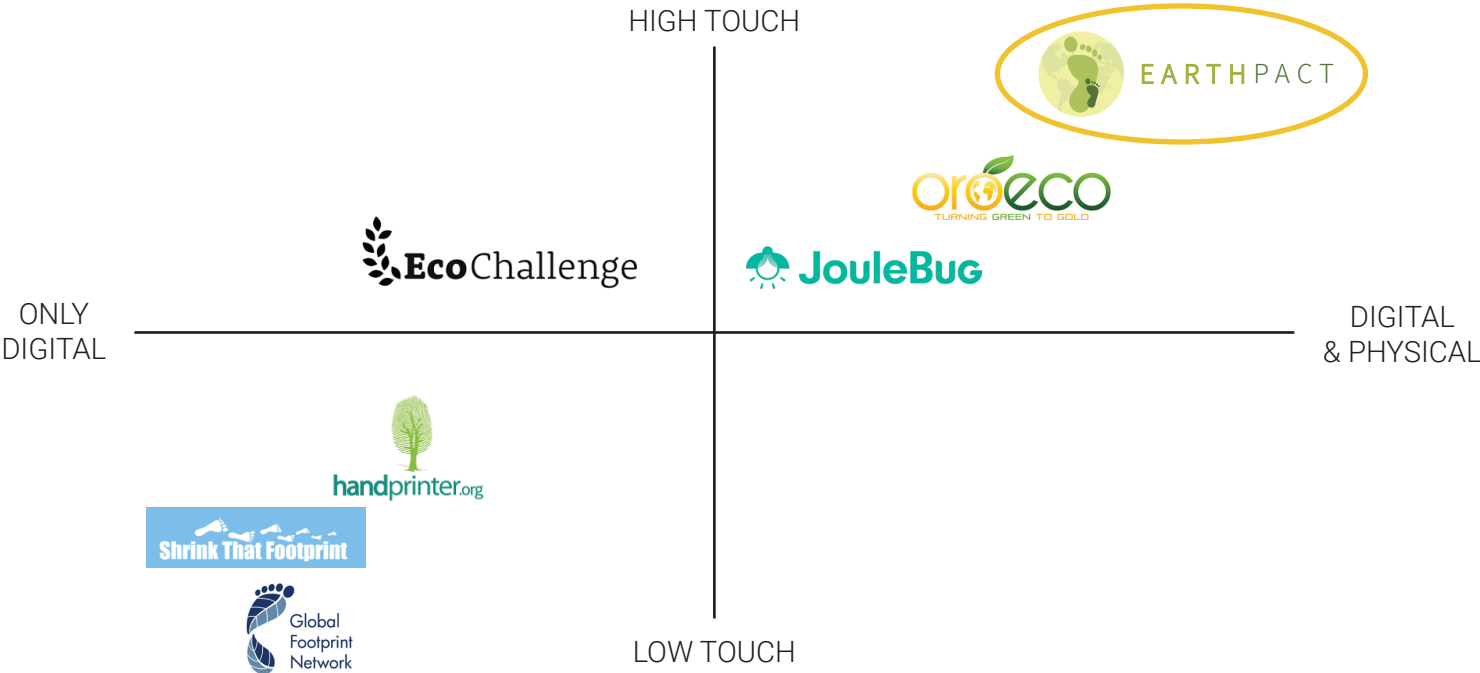
EarthPact is unlike other footprint calculators available. Not only does it raise awareness of people's impact on the environment, but also it engages people in both tangible exhibits, as well as through a digital platform. This differentiates EarthPact from other footprint calculators. EarthPact SF's physical exhibits incorporate fun and play while also providing an educational experience. Through the EarthPact app, EarthPact maintains a high-touch relationship with the users after their footprint has been calculated, which holds them accountable to change their habits.

The competition includes Oroeco, JouleBug, EcoChallenge, Global Footprint Network, Shrink Your Footprint, and Handprinter. Another thing that differentiates EarthPact from the competition is that it invites users to make a pact to change their behavior for each of the five topic areas of the ecological footprint. The pact holds users accountable for the changes they pledge to make when the information about their behavior is fresh in their minds. The EarthPact app sends notifications to remind users of their pledges, which helps them to stay on track and follow through with behavior change. Also, users receive positive encouragement with acknowledgement of their positive behavior.

Like competitors Oroeco, Joulebug, and EcoChallenge, through the app, users track can their progress, learn tips, receive rewards to encourage continuing on the path of improved practices, connect to their social network, and look up the effects of different behaviors anywhere, anytime. EarthPact goes beyond with their app by including a notification feature to stay high-touch and help users reach their goals.

# COMPETITIVE AXIS

In the competitive axis below, it is clear that EarthPact is bringing new offerings to the footprint calculator space by being a high-touch digital platform and providing digital and physical interactive experiences with EarthPact SF. We believe EarthPact adds value to adults in urban areas and will bring about sustainable behavior change more effectively than the competition. We hope to see EarthPact spread to other C40 cities in the coming years to yield a deeper connection to people's ecological footprints through physical exhibits accompanied by the EarthPact app.



See Appendix for additional information about competitors and their offerings.

# BUSINESS MODEL

Rather than revenue, EarthPact will require a funding stream and we believe the true revenue of the project is the sustainable impact, which we've added to the business model canvas.

<p><b>KEY PARTNERS</b></p> <ul style="list-style-type: none"> <li>- Global Footprint Network</li> <li>- City of SF</li> <li>- San Francisco Agencies</li> <li>- C40 Cities</li> <li>- Event Hosts</li> </ul>	<p><b>KEY ACTIVITIES</b></p> <ul style="list-style-type: none"> <li>- EarthPact SF Exhibits</li> <li>- Working EarthPact App</li> <li>- Fundraising</li> <li>- Ecological Footprint Calculations</li> </ul>	<p><b>VALUE PROPOSITIONS</b></p> <ul style="list-style-type: none"> <li>- Learn Ecological Footprint</li> <li>- Understand Impact</li> <li>- Learn Tips to Reduce Impact</li> <li>- Track Metrics</li> <li>- Rewards for Sustainable Behavior</li> <li>- Check Effects of Behavior Anytime, Anywhere</li> </ul>	<p><b>CUSTOMER RELATIONS</b></p> <ul style="list-style-type: none"> <li>- Education</li> <li>- Environmental Pledge</li> <li>- High-touch</li> <li>- Long-term</li> </ul>	<p><b>CUSTOMER SEGMENTS</b></p> <ul style="list-style-type: none"> <li>- Adults</li> </ul>
<p><b>COST STRUCTURE</b></p> <ul style="list-style-type: none"> <li>- Exhibits Design</li> <li>- Exhibit Production</li> <li>- Exhibit Installation</li> <li>- Permits</li> <li>- App Development</li> <li>- Administration</li> <li>- Marketing</li> <li>- Maintenance</li> <li>- Insurance</li> </ul>	<p><b>KEY RESOURCES</b></p> <ul style="list-style-type: none"> <li>- IP for Ecological Footprint</li> <li>- City Approval</li> <li>- Public Space</li> </ul>		<p><b>CHANNELS</b></p> <ul style="list-style-type: none"> <li>- App</li> <li>- Online</li> <li>- Physical Exhibits</li> <li>- Marketing Collateral</li> <li>- Notifications</li> <li>- Email</li> <li>- Crowdfunding</li> </ul>	
<p><b>SUSTAINABLE IMPACT</b></p> <ul style="list-style-type: none"> <li>- Reduction in number of planets it takes to sustain people's lifestyles</li> <li>- Large scale change in patterns of consumption of resources, leading to a significant, sustained and measurable reduction in net impact on the environment</li> <li>- Reduction in SF's environmental impact</li> <li>- Reduction in C40 Cities' environmental impact</li> </ul>		<p><b>FUNDING STREAM</b></p> <ul style="list-style-type: none"> <li>- City</li> <li>- Crowdfunding</li> <li>- Ads on App for events on sustainability</li> </ul>		

# COST ESTIMATE

The cost estimate is based on reports from Living Alley and Living Innovation Zone projects of similar size and most of the costs are one-time startup costs.

	<b>Item</b>	<b>Cost (\$)</b>	<b>Total \$ (in thousands)</b>
1.	Exhibit Design	50,000	50
2.	App (design and development)	250,000	250
3.	Exhibit Production/Installation	75,000 X 5	375
4.	Permits	10,000	10
5.	Marketing and PR	100,000	70
6.	Administration	12,000	12
7.	Insurance	8,000 per year	8
8.	Maintenance	10,000 per year	10
	<b>TOTAL</b>		<b>\$785</b>

# PARTNERS & FUNDING



## **Project Lead**

- EarthPact



## **Community Partners**

- Community Benefits District (CBD)
- Business Improvement District (BID)
- Global Footprint Network - IP
- C40 Cities



## **City Partners**

- Mayor's Office of Civic Innovation
- SF Planning Dept.
- SF Dept. of Public Works
- Other agencies within the City are brought in as needed



## **Funding Partners**

- The City
- Crowdfunders\*
- Ads for Events t Sustainability

\*Using crowdfunding sources such as Indiegogo and Kickstarter would both generate funds, along with giving people a sense of ownership and participation in EarthPact, even for a small donation of \$50. Public projects such as Living Innovation Zones have previously used this method of funding. The funds raised would be used to create, install, and maintain the exhibits and app.

# VALIDATION

## DOLORES PARK PROOF OF CONCEPT

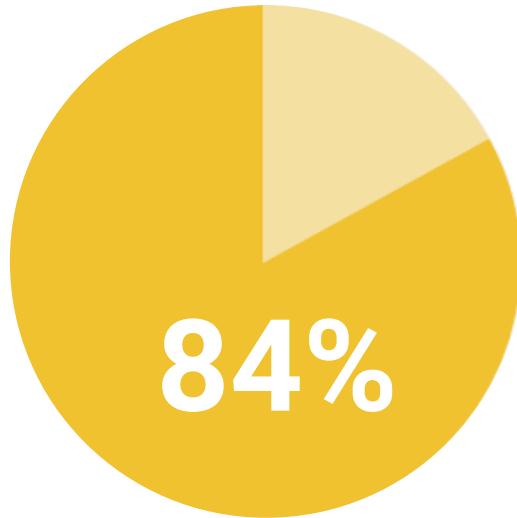
Our team went to Dolores Park to conduct validation. We validated with over a dozen people by showing our posters and explaining the concept, the exhibit details, and the participant journey map. After reviewing our project, we asked the stakeholders a series of questions to understand the interest and relevance of EarthPact SF and the EarthPact App.





## DOLORES PARK PROOF OF CONCEPT (CONTINUED)

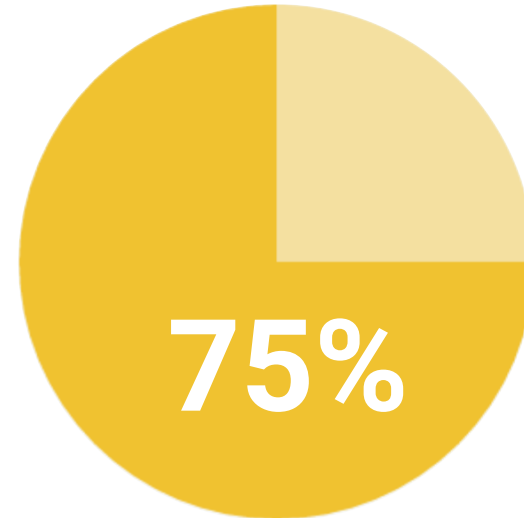
The following are the key findings from our validation exercise at Dolores Park.



did not know about the  
Ecological Footprint

**“It’s a good idea. It’s great to have low  
barrier to entry and an interactive display.”**

*- Dolores Park Interviewee*



said EarthPact SF is an  
installation they'd visit

**“I like being able to see the outcome of the  
behavior change from taking the pledge.”**

*- Dolores Park Interviewee*



## PROOF OF CONCEPT

We presented our initial EarthPact concept to Julieta Collart, an Innovation Strategist at the Mayor's Office of Civic Innovation. She said the following:

**“The Living Innovation Zones initiative and the Department of the Environment would both be interested in your concepts.”**

We also had a discussion about interactive exhibits and gamification with Christina Wodtke, an Interaction Design Professor at CCA. She said the following:

**“Play is another word for learning.”**

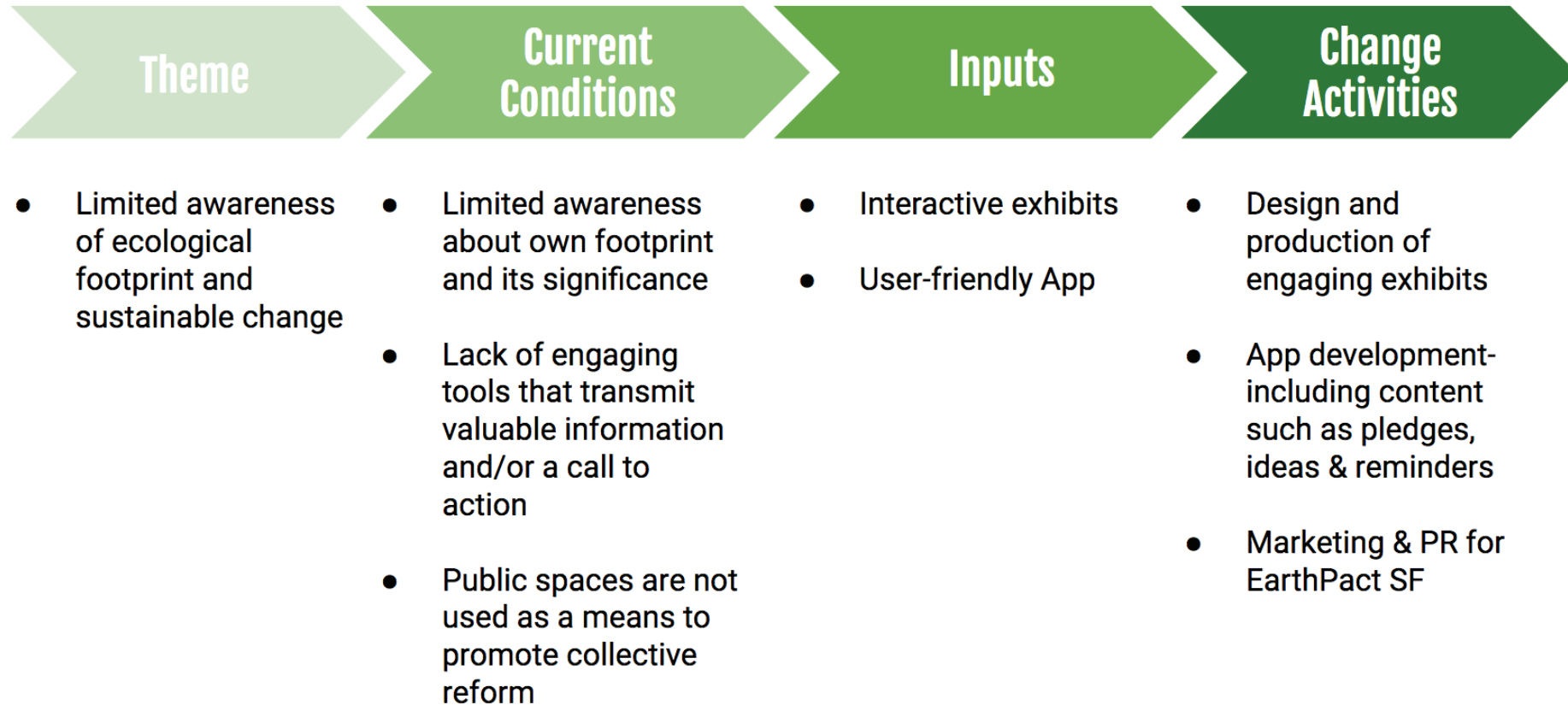
# THEORY OF CHANGE

## THEORY OF CHANGE

EarthPact will reduce people’s individual ecological footprint and prompt sustainable behavior change by engaging people in interactive and informative physical exhibits and providing a defined course of action through an app that results in significant, measurable change in environmental impact.

NEEDS (context)	IF...	THEN (short term)	THEN (Long term)
Lack of awareness amongst adults about personal ecological footprint	Citizens were made aware of their ecological footprint and its impact on the earth by means of interactive exhibits	They would be inclined to take immediate action (pledges) prompted by the platform	The sum effect of all the pledges would conserve resources such as water and fuel, and reduce carbon emissions
Individuals are aware of their impact and want to take action, but are unable to decipher where to begin and struggle to stay consistent	Technology was leveraged to transmit easily digestible information at the apt moment via a user-friendly App	The user would receive reminders to stay on track with their action-plan and see their progress in minimizing their impact	The user will be motivated to encourage others in their network through the App, thereby fostering collective action
Several underutilized public spaces (ghost spaces) in prime locations of metropolitan cities- which means both economic (opportunity cost) and social loss	Playful and engaging exhibits attracted adults into these public spaces	Social cohesion would be facilitated, making the public space vibrant again	Having the space converted from a ghost space to an active space can lead to financial and social gains (net positive) and this model could be replicated globally through partnerships with C40 cities

# SROI – EARTHFACT INPUTS



# SROI – EARTHACT OUTCOMES



- Awareness of personal footprint in quantifiable terms
- Commitment to action with the goal of minimizing one's impact on the environment (pledge on App)

- Small changes in individual's habits of consumption- food habits, mobility, energy consumption etc.

- Large collective change by all users that have interacted with the exhibit and follow through with their pledges
- Replication of the model in other cities (potentially C40)

- Large scale change in patterns of consumption of resources, leading to a significant, sustained and measurable reduction in net impact on the environment

## IMPACT EXAMPLE

**IF:**  
**182,500 VISITORS** visit the plaza per year\*

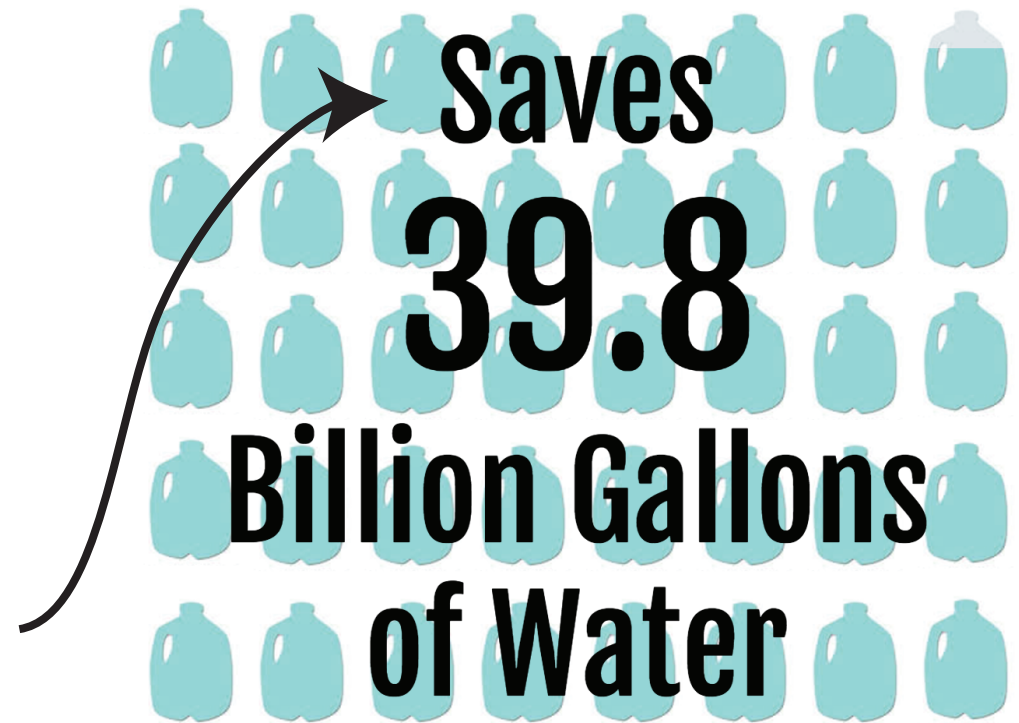
**AND:**  
**50%** of visitors **INTERACT** with the *EAT Exhibit* and download the app

*of which*

**70%** of the EAT Exhibit visitors **PLEDGE** to modify their behavior to go **MEATLESS ON MONDAYS**

**THEN:**  
63,875 people reduce their meat consumption by a total of **1.6 MILLION OUNCES**

\*Traffic is calculated at 500 people per day



## CONCLUSION

We aimed to explore the relationship between individuals and their ecological footprint, and how we might facilitate a deeper connection between the two in order to incite behavioral change. Our research finds that an understanding of one's impact, supported by interaction and discussion, will prompt people to modify their behavior.

The combination of EarthPact's physical and high-touch, digital elements will keep users engaged for a long time and hold them accountable to the pacts they make. Through tracking the metrics of users' activities, Earthpact can quantify the net change in resources consumed i.e. impact on the planet.

EarthPact employs underutilized public spaces as the medium for the exhibits, thereby simultaneously revitalizing former ghost spaces. By being located in public spaces, EarthPact also benefits from the visibility and traction it will receive in a high-traffic area, and the role that bringing a community together can play in fostering change.

We believe that EarthPact is the answer to engaging people with their environmental impact, and empowering them to to reduce their ecological footprint. Our hope is for EarthPact to grow across the United States and expand to C40 cities around the world, leading to significant reduction in the number of planets required to sustain people's lifestyles.

# APPENDIX



## **INTERVIEWS AND SURVEY**

We interviewed some of our stakeholders, and surprisingly realized that almost 80% of them were unaware of their environmental footprints have some negative influence on this earth.

### **Public Space Survey**

100% of respondents visit public spaces

Top public spaces visited:

Parks, Plazas/Public Squares, Beaches

Frequency of visits to public spaces:

33% visit 2-4 times per week

22% 1x per month

Who they go to public spaces with:

83% go by themselves or with friends

What people enjoy about public spaces:

28% mentioned being around or seeing people (community)

56% mentioned nature, being outside, or fresh air

Activities:

83% people mentioned they like to engage in physical activity while in public spaces

Innovation Strategist at the SF Mayor's Office of Civic Innovation

Interaction Design Professor at California College of the Arts

Interviews in Justin Herman Plaza and public spaces in LA

Interviews in California Academy of Sciences and California Science Center

Interviews in Dolores Park

Surveyed 25+ stakeholders about Public Space and Footprint Awareness

## **SECONDARY RESEARCH FROM THROUGHOUT THE SEMESTER INCLUDES:**

### **Evidence that people aren't aware of their impact on the environment:**

<http://news.nationalgeographic.com/news/2012/07/120712-greendex-environment-green-sustainable-science-consumers-world/>

- Americans are the the least likely to suffer from "green guilt" about their environmental impact, despite trailing the rest of the world in sustainable behavior
- Conducted by the National Geographic Society and GlobeScan since 2008, the Greendex report explored environmental attitudes and behaviors among 17,000 consumers in 17 countries through an online survey that asks questions relating to housing, transportation, food, and consumer goods.
- This year Americans ranked last in sustainable behavior, as they have every year since 2008. Just 21 percent of Americans reported feeling guilty about the impact they have on the environment, among the lowest of those surveyed.
- Part of the problem is that in the U.S. and many countries, there is a lack of good information and trusted sources regarding green products that consumers can turn to, said Thomas Dean, of Colorado State University's College of Business, who did not participate in the survey.
- Dean thinks setting up a third-party certification system for green products like the one that exists for organic foods would be helpful.

### **Evidence that people will change behavior:**

<https://www.forbes.com/sites/erikaandersen/2012/08/17/3-things-you-can-do-to-change-peoples-behavior/#1e678de27a0a>

- In nature, there are basically two kinds of change: evolutionary and disruptive. Evolutionary change is gentler, less destructive...but it takes a very long time. Disruptive change is fast, and sometimes necessary

### **Evidence that people will change behavior through our solutions:**

<https://www.gse.harvard.edu/news/uk/05/09/learning-museums-0>

- Active learning is important: people learn more deeply and retain knowledge longer when they have opportunities to engage actively with the information and experiences at hand, even if these opportunities are punctuated with moments of passive receptivity.
- When people have some degree of personal agency – some range of choice about the shape and direction of their own learning activities – learning tends to be more meaningful and robust.
- In art museums, active learning and personal agency are natural partners. When we're in charge of our own learning, we often do find opportunities to engage our minds, especially in environments rich with evocative objects and experiences.

## SECONDARY RESEARCH (continued)

<http://www.childrensmuseums.org/images/MCMResearchSummary.pdf>

- Play may seem simple, yet it is profound to a child's development. Play makes learning something that happens naturally and joyfully, when a child laughs and wonders, explores and imagines.
- For more than 30 years, Minnesota Children's Museum has embedded research on play and child development into interactive learning environments through its exhibits and programs.
- Playful learning is fun – and it's powerful.

<https://www.getty.edu/education/symposium/Ringel.pdf>

- Children aged 4–6 are just beginning to develop their own ethnic identity and they have an interest in how and why people do things. They are able to elaborate on group differences and, curiously enough, they believe they can change their ethnic identity – sometimes by changing their clothes. They begin to self identify as a group member, and they have clear feelings towards different groups.

<http://infed.org/archives/e-texts/screven-museums.htm>

- To effectively communicate substantive knowledge or alter attitudes or misconceptions under informal learning conditions is a formidable but not impossible task. Self-directed learning already is part of learning sports, hobbies, music, social skills, attitudes, problem solving and other aspects of lifelong learning. Learning under natural conditions may or may not be as appropriate, useful or efficient as it might be under formal teaching conditions. But people are changed by such natural encounters, sometimes for the better, with most aspects of their daily lives, including museum experiences.
- In museums, research suggests that contingencies operating in and around exhibitions can affect their potential educational impact as a part of the natural exploration of museum displays.
- To achieve both visitor attention and communication, exhibitions need goal-directed and discovery activities (e.g., making predictions, completing a task, resolving a question) that reward appropriate attention. The goal is that visitors use exhibition content as the framework for the learning activities. Visitors must operate a dial, compare two events, look for answers to a question, etc. ("What makes the ball come down?" "What is missing in this picture?" "What happens if X is kept constant?") In other words, the positive results from attending and doing sustain this attention. Such natural (intrinsic) rewards can take many forms, but can include such simple things as completion of a task, achieving a prescribed score or performance level, or successfully predicting an event.

## **SECONDARY RESEARCH (continued)**

[http://www.huffingtonpost.com/lilia-ziamou/interactive-museum-exhibits\\_b\\_1438931.html](http://www.huffingtonpost.com/lilia-ziamou/interactive-museum-exhibits_b_1438931.html)

- Learning through physical activities and play increased visitors' involvement and made this activity fun and engaging.

[http://greatergood.berkeley.edu/article/item/six\\_ways\\_to\\_help\\_people\\_change](http://greatergood.berkeley.edu/article/item/six_ways_to_help_people_change)

### **6 Ways To Help People Change**

- 1) Lead by example
- 2) Suggest change
- 3) Give the right feedback
- 4) Support good behavior
- 5) Take advantage of laziness
- 6) Develop support networks

## **Public Space Secondary Research**

**How public spaces will help change cities for the better:** Although solutions should obviously be tailored to the specific context of each city, there are six key priorities that emerged during the symposium:

**Redefining infrastructure with place-led development:** Cities do not exist without people and it is important to shape the city according to their needs. The design of public places should allow all residents to take ownership of them, so they can become a shared asset that the entire community can enjoy. Actions should be taken to create vibrant and healthy cities for all people regardless of age or social, economic, or ethnic background. Putting parks and play areas within short walking distance, opening the streets to people by closing them to cars, and improving safe walking as well as bicycling for people are some of the doable actions that can make a big difference.

**Integrating Urbanscapes into World Bank projects.** In several World Bank projects, interventions at the urban street level were instrumental in improving beneficiaries' overall quality of life, especially for the urban poor and disadvantaged, while also enhancing livability, improving prosperity, and supporting city transformation. Transforming public spaces and streetscapes: I love walking but never thought of its function within the city before. The walking environment in cities and pedestrian priority on the streets are very important for mobility, which in turn provides accessibility to public spaces for all.

**Fostering economic development through urban places:** Not only can urban public spaces make people feel better, safe, and included, but they can also foster economic development. The quality of a place leads to attachment, and the attachment leads to higher growth. How could this happen? Because in addition to being sociable, accessible and comfortable, a good place should also be full of uses and activities, which in turn boost the economic activity over there. Projects like the London Olympic Park or Washington DC's Anacostia River Waterfront, for instance, brought about economic development to the neighborhoods around them.

## SECONDARY RESEARCH (continued)

**Measuring and innovating urban spaces:** More quantitative data could be used in urban design. Learning about innovative as well as quicker and cheaper design alternatives for public spaces like parklets and Living Innovation Zones (LIZs) in San Francisco was very inspiring in that sense. LIZs, which are temporary installations created in the city, provide not only public spaces for people but also an exhibition and experimentation area for creative projects and innovative technologies.

**Creating safer and more inclusive public spaces.** There are several examples of cities in different parts of the world that successfully transformed from violent, criminal and unsafe environments, into inclusive, safer and more livable places. Public space enhancement projects in Karachi, Medellin and Honduras, whose common point is to include the citizens in the process, showed how such transformation could be possible. Creating public spaces “for and with the people” was the key in all those three examples. And a change towards more inclusive public places brought about a sense of belonging, togetherness and in turn safety to these environments.

### **The floor tiles that use foot power to light up cities**

The Pavegen technology is a multifunctional custom flooring system. As people step on the tiles, their weight causes electric-magnetic induction generators to vertically displace, which results in a rotatory motion that generates off-grid electricity. .

<http://www.pavegen.com/about/>

<https://www.theguardian.com/technology/2015/jan/11/floor-tile-generates-power-from-footsteps-energy-electricity-startup>

### **Additional Sources**

<https://www.psychologytoday.com/blog/happiness-in-world/200910/5-steps-changing-any-behavior>

[http://cfw.essie.ufl.edu/seminars/seminar\\_extras/Sp15\\_Monroe\\_CanEducationChangeBehavior.pdf](http://cfw.essie.ufl.edu/seminars/seminar_extras/Sp15_Monroe_CanEducationChangeBehavior.pdf)

<https://hbr.org/2008/07/choosing-strategies-for-change>

<http://inhabitat.com/eco-park-in-uruguay-hopes-to-fuse-eco-tourism-with-non-profit-sustainable-projects/>

<http://www.bayareabikeshare.com/>

<http://indicators.report/indicators/i-70/>

[http://www.footprintnetwork.org/gfn\\_sub.php?content=global\\_footprint](http://www.footprintnetwork.org/gfn_sub.php?content=global_footprint)

<https://www.theguardian.com/sustainable-business/motivates-consumers-environmental-ethical-decisions>

<https://minerva-access.unimelb.edu.au/handle/11343/92074>

<http://news.nationalgeographic.com/news/2012/07/120712-greendex-environment-green-sustainable-science-consumers-world/>

<https://www.forbes.com/sites/erikaandersen/2012/08/17/3-things-you-can-do-to-change-peoples-behavior/#1e678de27a0a>

<https://www.gse.harvard.edu/news/uk/05/09/learning-museums-0>

## SECONDARY RESEARCH (CONTINUED)

### Footprint Calculator Competition

JouleBug

About:

An app that is “mobile, playful, and connects to your utility account so you can watch your savings soar as your bills shrink.”

Offerings:

Measurable Impact: Track utility usage and challenge analytics

Social network: connects to social media

Communities on the App: to learn the latest on sustainability near you

Rewards: Earn points to compete in Challenges, or play your friends.

Encourage good behavior: Buzz whenever you do something sustainable.

Available for Organizations

<https://joulebug.com/>

EcoChallenge

About:

With EcoChallenge, “you to choose 1 action to reduce your impact and stick with it for the duration of the challenge. You pick your Challenge and set a goal that stretches your comfort zone and makes a difference for you, your community and the planet.”

Offerings:

Website Platform: Users sign up on a website share their progress and earn points for taking action.

Community: Connect with your network or join a Community Team: camaraderie and friendly competition makes change a little easier – and a lot more fun.

Track Progress: Track your progress, share your stories, connect with other EcoChallengers, and discover new ways to take action.

Rewards: Earn points for logging your actions each day of the challenge – your points help you win competitions with other teams and demonstrate our collective impact!

Community Feed: Post to the EcoChallenge feed to inspire others (you’ll also earn more points!).

Collective Impact: Collective Impact page - see how thousands of people acting together can have a positive impact on our community and the planet.

<https://ecochallenge.org/>

## SECONDARY RESEARCH (CONTINUED)

Oroeco

About:

Oroeco automatically puts “a carbon value on everything you buy, what you eat, how you get around, and the energy you use at home. Then we add everything up, so you can see which decisions are bigger than others and how you compare with your neighbors, using scientific data from our partnership with UC Berkeley's CoolClimate research group.”

Offerings:

Personalized tips: Tips for how you can save money along with the climate

Social network: we make everything fun and social, connecting with Facebook to compare, collaborate, and compete with your friends and family

Rewards (coming soon): soon you'll be able to earn points, prizes and real-world deals for taking action.

Articles on blog

App or website login

Set goals

Financial tracking: Credit card, investment, and bank accounts are linked

Companies: Available for organizations

<https://www.oroeco.com/>

Global Footprint Network

About:

“Global Footprint Network is a research organization that is changing how the world manages its natural resources and responds to climate change. Since 2003 we’ve engaged with more than 50 nations, 30 cities, and 70 global partners to deliver scientific insights that have driven high-impact policy and investment decisions. Together, we’re creating a future where all of us can thrive within our planet’s limits.”

The Ecological Footprint is the only metric that measures how much nature we have and how much nature we use.

The Footprint helps: COUNTRIES improve sustainability and well-being, LOCAL LEADERS optimize public project investments, and INDIVIDUALS understand their impact on the planet

Offerings:

Website: The website has a variety of data <http://www.footprintnetwork.org/>

Ecological Footprint Calculator: Available through website

## SECONDARY RESEARCH (CONTINUED)

### Shrink That Footprint

#### About:

"Shrink That Footprint is about how we can harness this power with actions, technologies and innovation to create low carbon lifestyles that are both desirable and consistent with a stable climate."

#### Offerings:

The website is comprised of four main sections:

The Shrink Guide: a ten step guide for shrinking your footprint

Carbon Calculator: an online tool for working out your footprint

Weekly Blog: footprint tips, ideas, fun and commentary

Publications: reports that take a deeper look at a key issue

<http://shrinkthatfootprint.com/>

### Handprinter.org

#### About:

This org has a test like the footprint tests that people can take to calculate their handprints. "It's called a handprint, and it measures the positive impacts we can make, simply by changing the way we do things, at home, and at work."

#### Offerings:

Calculator: It lets you calculate your environmental footprint

Tips: It offers suggestions for simple actions you can take to lower your impact on the planet

Share ideas: It lets you spread your ideas and actions around the world, see their progress, and measure them."

<http://www.handprinter.org/>