CS147-Local Community Studio

Assignment 5

Low-fi Prototyping & Pilot Usability Testing

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Wanderlust

“Worry less, explore more.”

People need a way to find interesting places, avoid unsafe areas, and be immersed in their current environment while navigating. Because traditional maps only suggest the fastest routes, people with the aforementioned desires cannot fulfill their needs. By providing users with high-level information about their surroundings and letting them set their navigation boundary, our app aims to facilitate immersion in the environment and worry-free exploration.

Sketches

Concept Sketches

Figure 1: Overview image of our sketches (wearable watch interface, setting boundary screens, navigating screens)

Top two designs storyboarded in detail

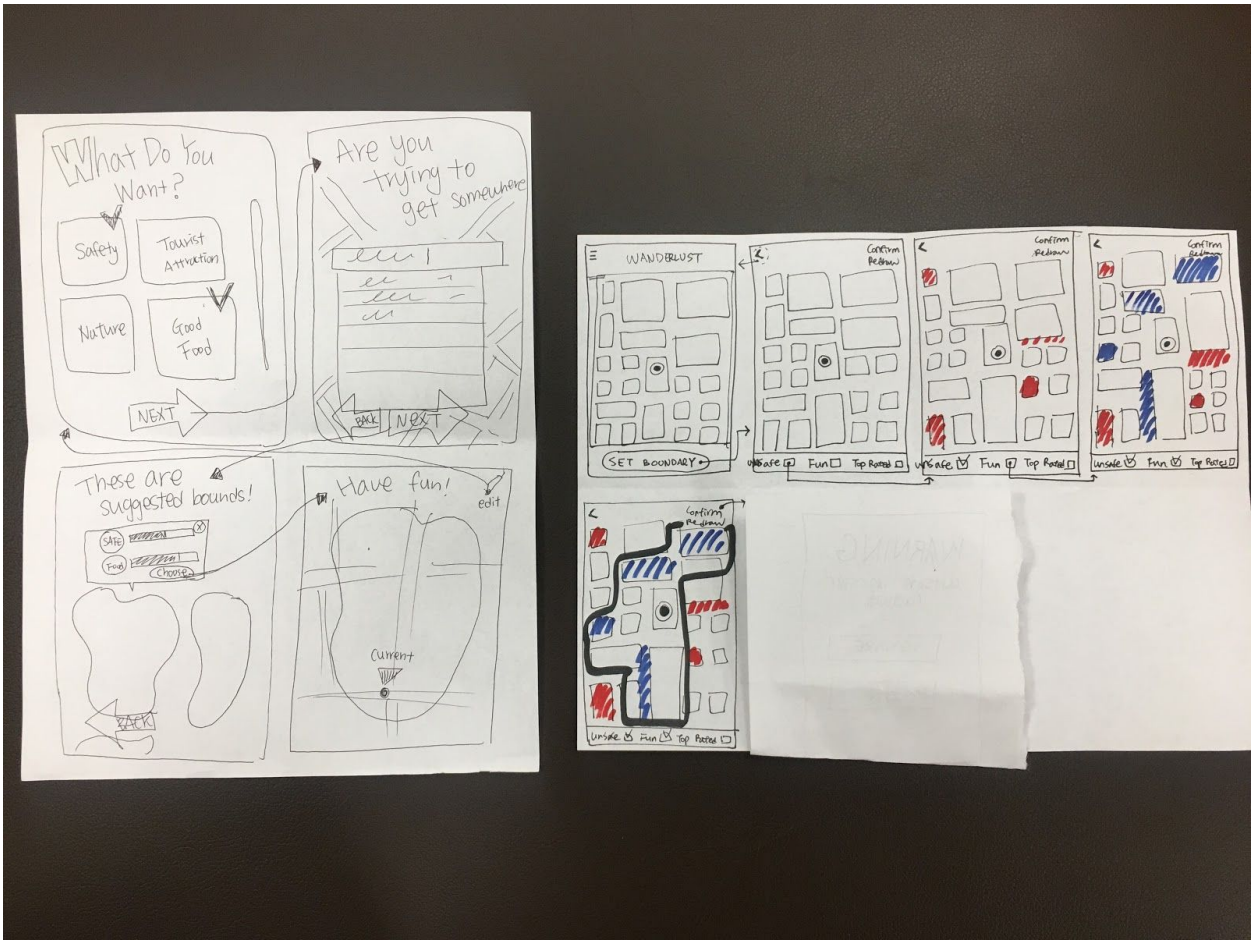

Figure 2: Top two designs storyboarded in more detail (storyboard A on the left, B on the right)

Storyboard A makes users answer questions about their preferences and suggests boundaries accordingly. Storyboard B provides on-demand information on the area to help users make informed decisions about how to draw *their own* boundary.

Selected Interface Design

Reasoning for Selection

Storyboard A

Pros	Cons
• Easier decision making; can just select one of suggested boundaries	• No freedom for the users to customize boundary

	○ No input on user's time constraints or personal tastes
● Less room for confusion; user answers a series of direct questions from the app	● Implementation complexity ○ Requires pre-processed data to come up with suggestions
	● Returning user can find pre-curated suggestions old

Storyboard B

Pros	Cons
● More customization	● More room for confusion; less direct guidance from the app
● Drawing your own boundary can be a fun and an engaging experience	● Harder decision making; user has to think about what they want and explore different choices to draw their own boundary
● More sense of control for user	

One of this app's goals is to support the unique navigation needs and desires of each user. Since we cannot anticipate all the unique travel circumstances of each user, it's better to let the user select their own custom constraints, with the app providing relevant information to help them. Although design B has a more complex UI, it's better to work on improving UI than to create an app that potentially overlooks a user's navigation context.

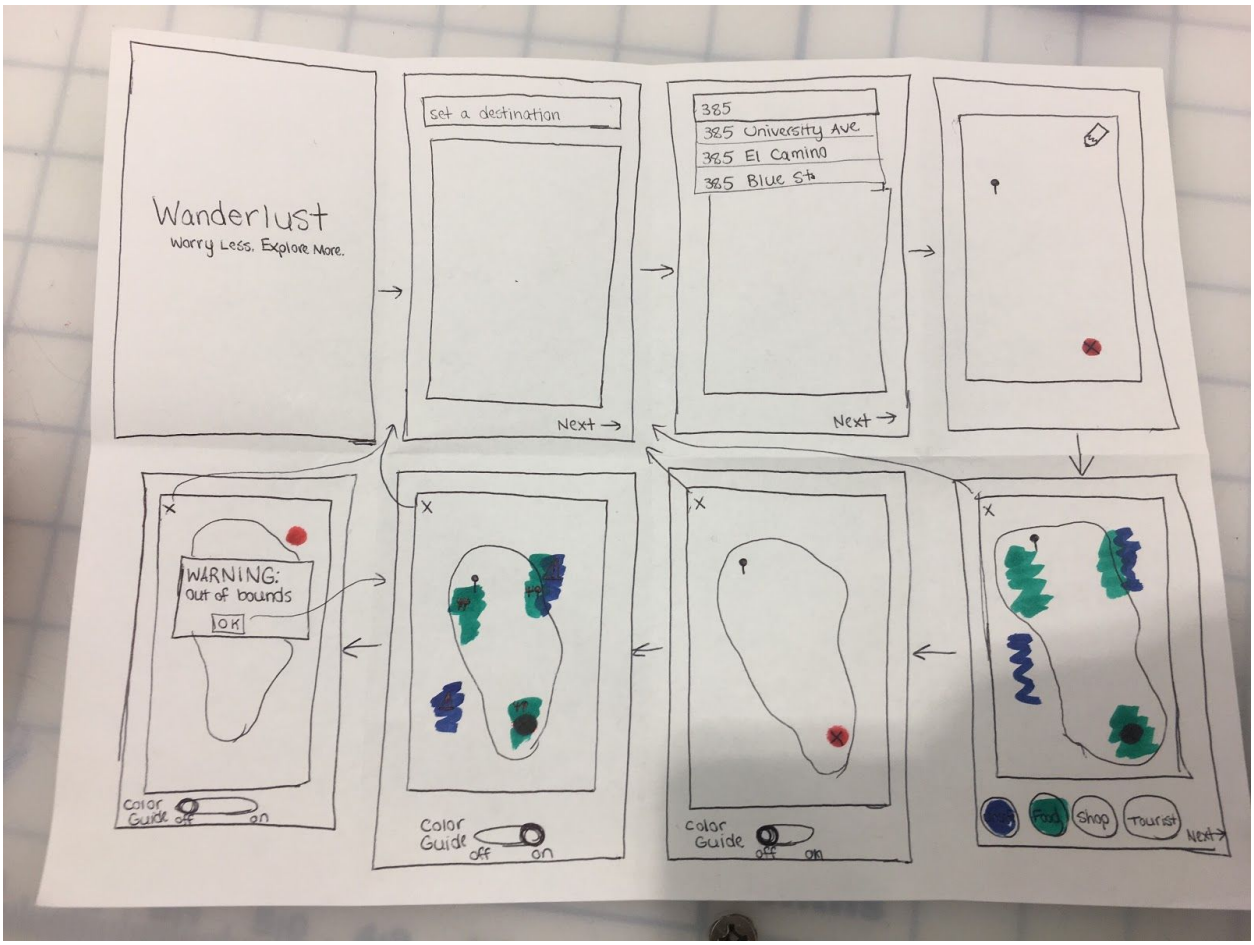

Figure 3: Storyboard for our three tasks (be safe while exploring, find interesting places while navigating, get to a destination)

Prototype

We used a paper prototype for our screens and a paper iPhone frame. Because we had many layers happening on the same screen, we used tracing papers for some transitions.

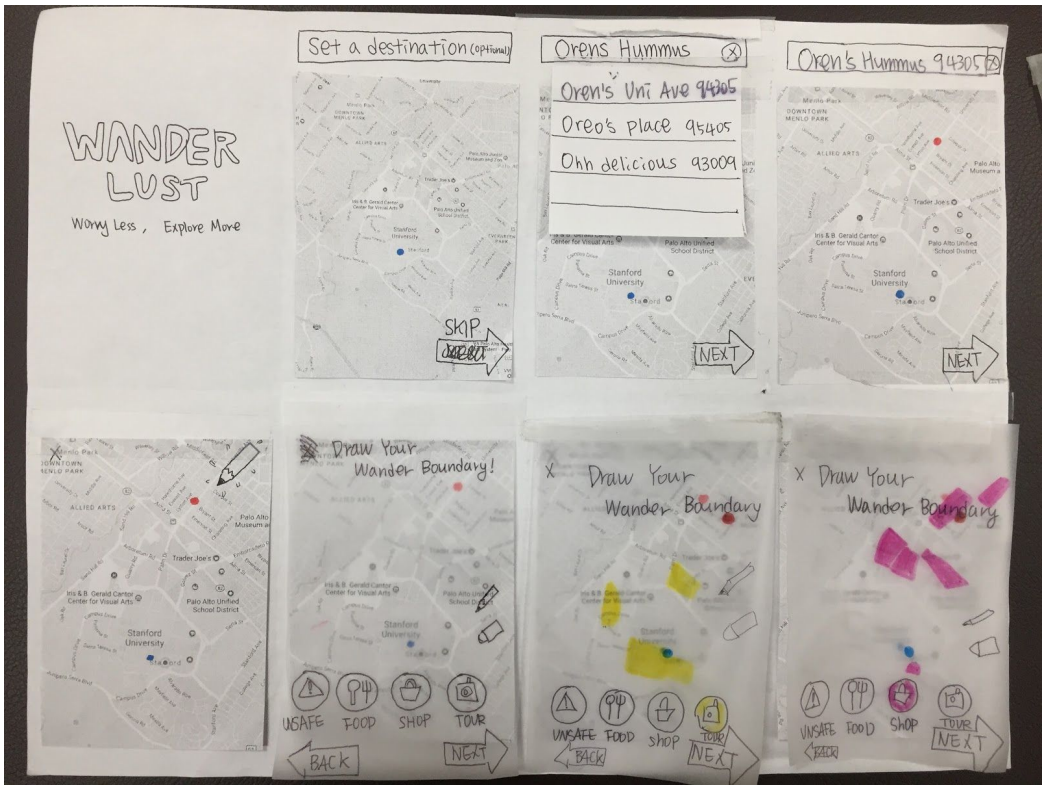

Figure 4: First eight screens of the prototype

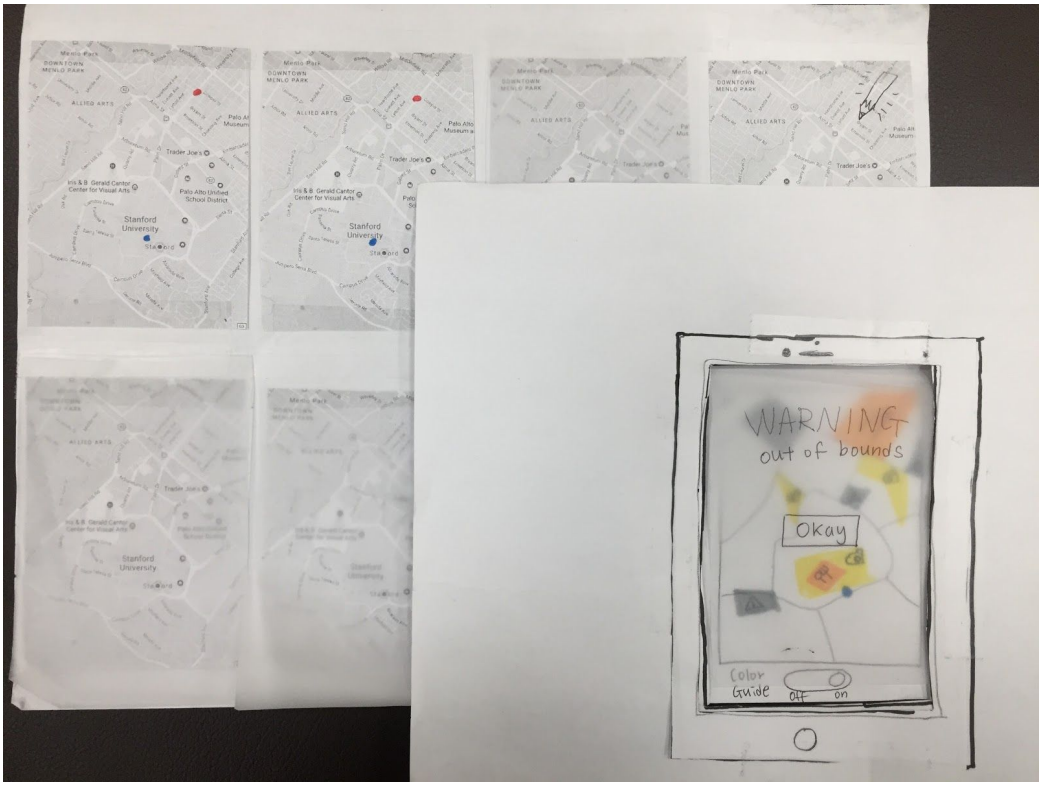

Figure 5: Usage of the paper frame phone

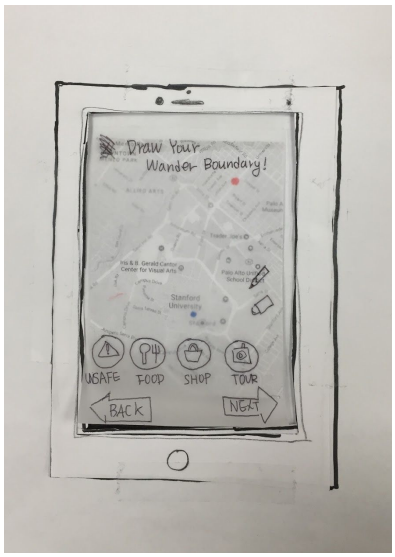

Figure 6: Boundary screen

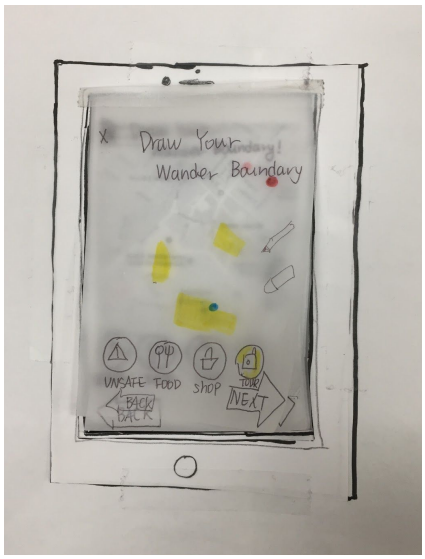

Figure 7: Boundary - tour

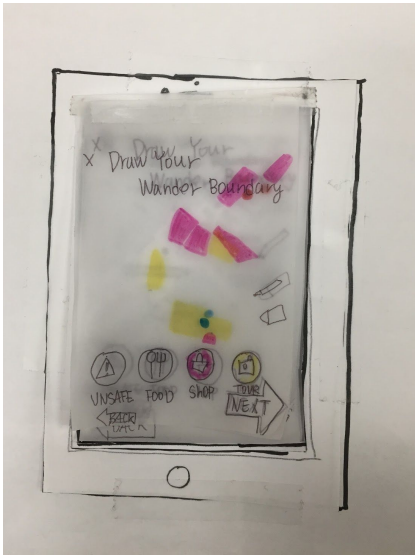

Figure 8: Boundary- tour&shop

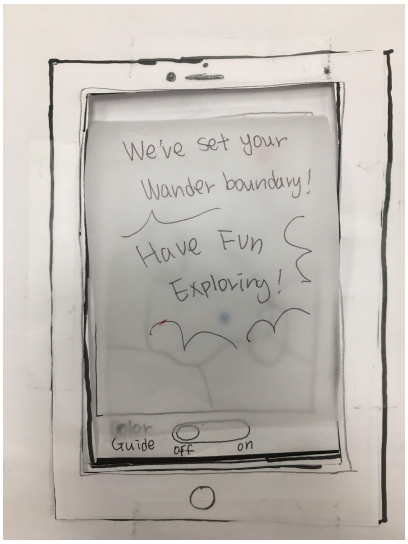

Figure 9: After Boundary

Figure 10: While navigating

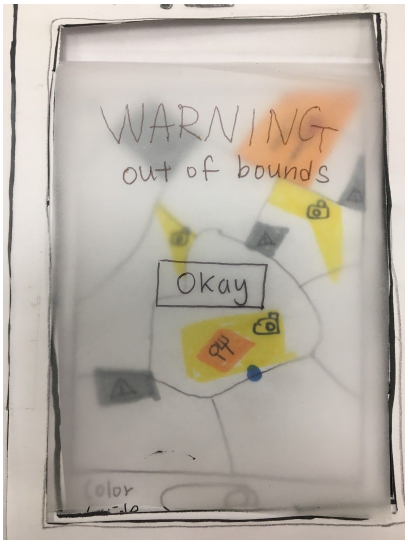

Figure 11: Warning Screen

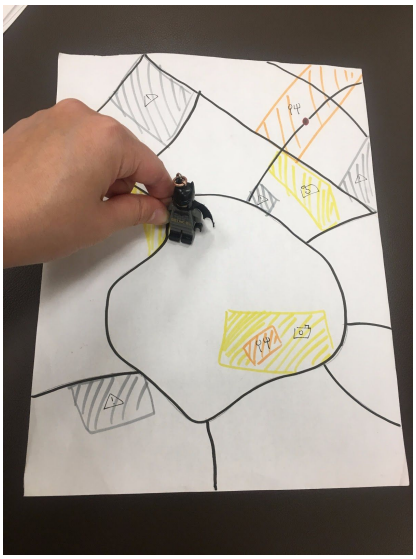

Figure 12: Bigger version of map

Method

Participants

Because our app aims to facilitate safe and exciting exploration of new areas, we sought out newcomers to the area and people who like to travel. At the Stanford bookstore, where tourists often congregate, we found Participant 1, a tourist from Rio, Brazil, and Participant 3, a startup founder who recently returned from a trip. Neither requested compensation. We recruited Participant 2, a Stanford freshman who recently moved here from Texas, by reaching out to a dorm email list and offering a $5 Amazon gift card.

Environment

We conducted our prototype test for Participants 1 and 3 at the tables in front of the bookstore, and we tested Participant 2 in the lounge of his dorm.

Tasks

After giving participants a brief explanation of our app, we presented them with the following scenario in which they were to complete our tasks:

"You are a visitor to Palo Alto. It's 11:00am now and you need to get to Oren's Hummus by 1:00pm. Since you have so much time, you want to wander around the area on your way to the restaurant and explore some interesting places. At the same time, you want to be safe in this new environment."

We then instructed users to complete the following tasks, in this order:

1. *"Set Oren's Hummus as destination"* (moderate).
   User types in a destination in "Set Destination" text field, selects the correct suggestion from the drop-down menu, and presses the "Next" button.

2. *"Draw a wander boundary that includes tourist areas and excludes unsafe areas"* (complex).
   User presses the buttons at the bottom of the "Draw wander boundary" screen to trigger various filters; uses the information from those filters to come up with a wander boundary that includes interesting, yet safe areas; draws the wander boundary; and presses "Next" to confirm.
3. *"Navigate to a tourist area"* (simple).
   User wanders inside the boundary they've drawn and makes use of the color filters (which they must toggle on) to find interesting places. We presented this task to test whether users would remain in bounds and to see whether they were able to correctly interpret the color filters.
4. *"Try stepping out of bounds"* (simple).
   We presented this task to see how users would react to the warning that pops up.

Procedure

We shifted the paper "iPhone" from screen to screen as the user interacted with the app and laid down sheets of tracing papers to represent some screen transitions. Users physically drew a boundary with a pencil on the tracing paper (See Figure 10). We provided users with a lego toy and asked them to move it around in an enlarged map to represent how they would travel based on the information the app gave them.

Test Measures

- We asked each participant to speak their thoughts out loud as they interacted with the app.
- We observed how long participants stared at a screen while trying to complete a task to gage their level of confusion.
- We observed whether the user's actions matched our expectations (e.g. drawing boundary when given a pencil icon on screen).

Team Member Roles

For Participant 1's testing session, Kye acted as "computer," Kijung acted as facilitator, and Julia acted as notetaker. Because Kye had to leave town for an interview, Kijung acted as both "computer" and facilitator in the remaining two testing sessions, and Julia acted as notetaker.

Results

Participant 1

Participant 1 had some difficulty setting the destination. He thought the “set destination” rectangle was a page title rather than a text field. Due to this, he kept trying to find Oren’s Hummus on the map instead of typing it in. For the second task, surprisingly, he had a very different understanding of the concept of boundary. Instead of drawing a boundary that encompassed places he *wanted* to travel, he drew boundaries around the unsafe areas (i.e. areas he wanted to stay out of).

Participant 2

Participant 2 had no trouble setting a destination, and his understanding of a wander boundary aligned with ours. After pressing the “Unsafe” button, he said he knew not to draw into

the grey unsafe areas because the color of the button also turned grey. He then played around with other filters, ultimately deciding to draw a boundary that included several tourist destinations. After confirming his wander boundary and being prompted for how he might locate the tourist areas he'd included in his boundary, Participant 2 toggled on the color guide and was able to easily interpret the color filters to get to a tourist area. After stepping out of bounds and receiving a warning, he reported he would then step back into the boundary.

Participant 3

Like Participant 2, Participant 3 was able to easily set a destination, but felt having to press "Next" after selecting his location from the dropdown menu was redundant. While drawing his wander boundary, he wondered whether it might be better to just have a draggable circle to set the boundary. While navigating to tourist areas, he wondered whether the app would warn him at some point that he needs to move faster to reach his destination on time. He wished he had more specific information about stores to shop at, and he expressed concern over what the app's GPS usage would do to his phone's battery life.

Discussion

Limitation of Prototype

The prototype fails to capture the actual complexity of physical navigation, such as time change and physical fatigue. Moreover, being a paper prototype, graphical cues were lacking. For instance, Participant 1 thought the "Set destination" rectangle was a page title rather than a text field.

Insights/Design Improvements

Participant 1's confusion when drawing the boundary led us to discover the term "boundary" does not have the same meaning for all users. To diminish ambiguity, we might cue users to draw their boundary around areas they *want* to travel within by fading out areas not within the boundary.

Participants 2 and 3 were confused about the meaning of the warning message. This led us to consider creating distinct warnings depending on whether the user is out of bounds or in an unsafe area. We may also want to provide first-time users with an explanation of the circumstances that will trigger a warning, so they can explore confidently.

All three participants voiced annoyance at having to manually turn on the color guide. While our intention with having the color guide off by default was to prevent temptation to continually look at one's phone, it seems users would feel safer and more empowered if they were able to *automatically* glance at the color guide.

Participants 2 and 3 also wished for a shorter flow while setting the destination, leading us to consider an automatic transition after clicking a suggested destinations from the drop down menu (see Figure 4). When prompted about his wishes for additional features, Participant 2 also suggested having the option to auto-create a boundary. This led us to realize even though we may provide users with the tools to make an informed decision before drawing their own boundary, some may still feel more comfortable if one is generated for them.

Appendix

(https://docs.google.com/document/d/1LUe6TN17yYde3kbrsvZnYNQpIsHm3dl6Zu3u0zvKB-8/edit)

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