



User Testing

Usability Tester: **Galina Sweet**
Writer: **Jennifer Wong**

Group Manager: **Veronica Ivaniukovich**
Designer: **Matthew Barrie**

*CSE 440: Autumn 2011
Assignment 8*

Problem & Solution Overview

As members of the University of Washington community, we are informed of crimes in our neighborhood through e-mails and texts from the UWPD. This system, however, lacks 1) a way to view past criminal activities, 2) any features that engage or interact with the user, and 3) a method for actively improving student safety. The *Husky Crime Guide* will be a **centralized dashboard for providing access to reported crimes** in the U-District area and **connecting students to safety resources** with the goal of increasing safety awareness and crime prevention around the U-District area. In addition to providing access to a user-friendly archive of UWPD's Alerts, Notifications and Timely Warnings, the application will supplement the crime reports with an interactive map depicting the location and severity of the crime. Students can filter these crimes by type, date, time, and location and details on a crime can be viewed by clicking on a pin. Additionally safety features include the locations of Emergency Blue Lights and nearby friends, as well as links to other safety resources.

The Husky Crime Guide will improve student safety by connecting UW students to resources that will increase their safety awareness and encourage them to be more proactive in protecting their safety.

Paper Prototype

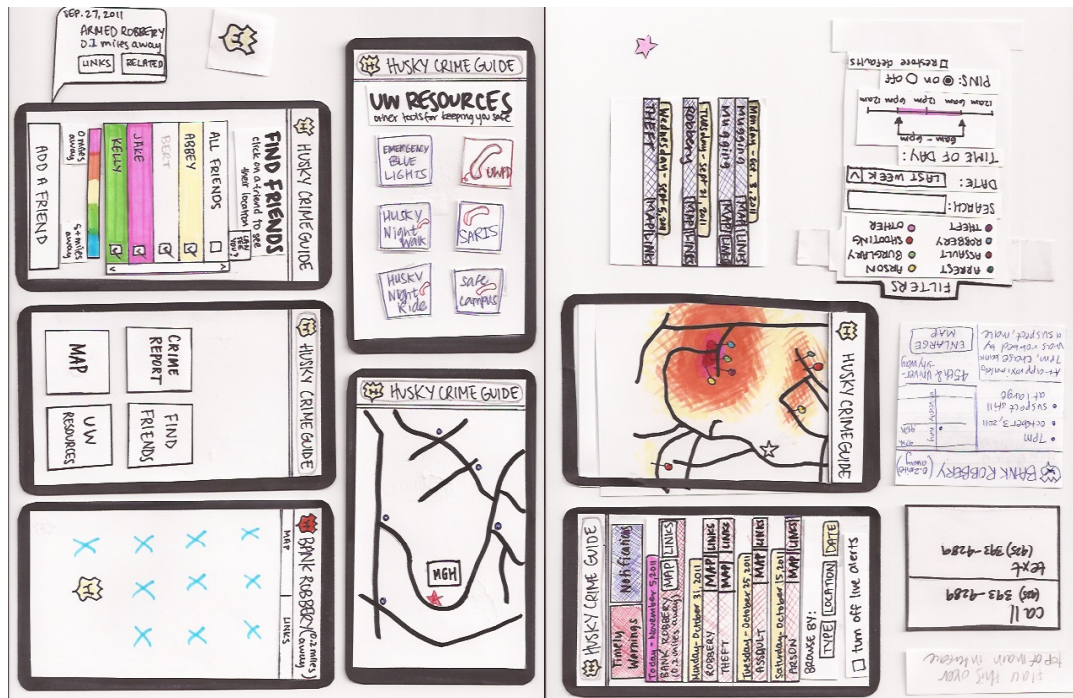


Figure 1: The mobile application version of the Husky Crime Guide.



Figure 2: The web application version of the Husky Crime Guide.

In order to conduct user testing of the Husky Crime Guide application, we produced a paper prototype of both the mobile and web interfaces as seen in Figures 1 and 2. Users interact with the mobile application by navigating through the main menu as seen in Figure 1. From the main menu, users can go to any of the four main functions of this application: the map, “Find Friends”, the crime reports, and links to resources. Users interact with this application as follows:

- **The map:** The Husky Crime Guide map is similar to Google Maps in that the

user can scroll and zoom in/out using their fingers. Crimes are displayed using both a heat map to indicate crime density and also color-coded pins, to display specific crimes. This application has the added option of allowing the user to customize their crime results using a filter. To access the filter, the user can drag up the “FILTER” tab at the bottom of the screen. Using this filter, users can change which crimes are displayed according to crime type, date, time, and keyword. Users have an option to turn crime pins on/off. Also the map provides an option to display physical location of Blue Emergency Lights. Blue Emergency Lights have direct connection to the UWPD who always come the location when an emergency button is activated. Blue Emergency Lights option can as well be turned on/off.

- **“Find Friends” and the crime reports:** These functions are essentially scrollable lists with items that can be clicked on for more information about the friend/crime. For example, if the user wanted to learn more about a criminal notification, they could click on that item and a bubble with additional information, a map, and related external links would appear. Or, if the user wanted to contact a friend, when they click on a friend’s name and a bubble with the option to call, text, or locate that friend on a map would appear.
- **Resources:** The additional resources function is a simple list of outside resources. There is also a link to viewing a map of the Emergency Blue Lights.

In Figure 2, the web application is essentially the same as the map feature of the mobile application. Students can access this application through myUW.

Testing Method

We tested three participants with our paper prototype using the with-in group approach. We randomly chose UW students of varying majors in order to simulate reality; students of all ages and interests will potentially use the Husky Crime Guide. Our three participants are described as follows:

- User One: Male, Informatics student, age 23, has a smart phone, frequent bus user
- User Two: Female, Anthropology and Public Health major, age 21, has a smart phone
- User Three: Female, English Major, 21, no smart phone
- User One said he was fairly comfortable with technology, whereas the latter users claimed to be less tech-savvy.
- All of these users were not familiar with the Husky Crime Guide and not overly aware of safety resources on campus (e.g. User One did not know what Blue Emergency Lights were).

We performed user testing in a computer lab on the UW campus, also in order to simulate reality; most students will be on campus while they use this application, and the second task requires a computer.

The tasks that the users performed during testing were as follows:

- **Task 1:** It is 11:00pm and you are finally leaving the library to go home. Before leaving the library you want to check you phone for any Timely Warnings and

also consult the Emergency Blue Light map to gain more awareness of your surroundings as you walk home. Please use the phone prototype to complete this task, speaking out loud to explain your steps.

- **Task 2:** It is 11:00pm and you are leaving the library to go home. As you are packing up you receive an alert about a crime that has recently occurred in the University District area. You don't want to walk home by yourself, so you need to use the Husky Crime Guide application to see if you can find your nearest friend to walk home with. Once you find your nearest friend, contact him to arrange walking home together. Please use the HCG application to complete this task and speaking out loud to explain your steps.
- **Task 3:** You were thinking of finding an apartment around the University Village area, however you want to make sure that the area is a safe place to live. Using the Husky Crime Guide web interface, try to identify a safer part of the University District area. The application can be accessed through myUW. Once you identify the area, explain your reasoning for why you choose that specific area.

Our general testing procedure was as follows:

- During testing, we set up a table so that the user was on one end, with our "wizard" sitting next to them. As the user interacted with the paper prototype with the help of the wizard, other team members showed them the tasks and took notes.
- Before showing the users the tasks, we described the purpose of the Husky Crime Guide application (i.e. to provide tools for improving student safety) and also explained how to interact with the application (i.e. treat the mobile application like a smart phone application). We also encouraged the users to think out loud, comment on things that they liked/disliked as they completed the tasks, and also ask questions. We did mention, however, that our group members could not help them complete the tasks so we would not be able to answer some of the users' questions.
- For the first and second tasks, we started by giving the user their mobile home screen, from which they could navigate to the Husky Crime Guide. We allowed the users to attempt to complete the tasks without any further instructions.
- For the third task, we started the user off with the myUW homepage and allowed them to navigate to the Husky Crime Guide from there. Again, we did not provide any more instructions on how to complete the task.
- After the user believed their tasks were completed (or, in some cases, a group member had to tell the user that the tasks were completed), we asked for any additional comments about this application.
- The roles of our group members were:
 - Jennifer: note taker
 - Matt: wizard
 - Veronica: introduced the application/tasks, note taker

As the users completed the tasks, we measured the following:

- How easy was it for the user to start the task? Could they quickly choose which button from the main menu to select?

- Once they started the task, how quickly could they complete it? Did they navigate to many unnecessary screens, or did they use the quickest route to complete the task?
- Did users understand the features of the Husky Crime Guide that may be unfamiliar to them (the heat map, filter tab, and “Find friends” are probably new concepts to most people)?
- How did users transition from the mobile application to the web version? Did they recognize how similar they were?
- Did the users encounter any dead ends where they were completely unsure of what to do next?

Testing Result

The results of our user testing were as follows:¹

User One:

Task 1: The first user was generally able to complete the first task without problems. He showed complete understanding of notification interface, and could clearly summarized the features using the main menu. He did note that not everyone knows what Emergency Blue Lights are for and that we did not have a back button.

Task 2: User One generally did not understand how to use the “Find friends” function of our application and did not successfully complete the task. He was able to eventually call a friend, but it was the wrong friend. He suggested adding search and ‘select multiple friends’ functions.

Task 3: User One completed this task in a matter of seconds, because he chose not to customize the view of the map. Instead, he looked at only the default values.

User Two:

Task 1: User Two was able to successfully complete the first task, but took much longer than the other users because she chose to read information about both the Notifications and Timely Warnings. She also clicked on more crimes to find out more information, which the other users did not do. In general, she was able to clearly understand the layout of the notification interface from the main menu and after clicking on Crime Reports.

Task 2: User Two was also able to successfully complete the second task without difficulty. Unlike the other users, she was able to easily interpret the proximity scale and correctly called the nearest friend. In order to see the Emergency Blue Lights, she used the UW Resources function, which other users also did not do.

Task 3: For Users Two and Three, we started them off with a blank map instead of a map with the last 10 crimes. However, User Two’s initial reaction to the blank screen was believing that there were no crimes in the U-District. But, User

¹ For more information about the results of each user, please see the Appendix.

Two even after clicking on the pins to learn more and explored multiple pins, her final decision about where to live was not crime related. Instead, she made her decision based on if the place was on a main intersection and its access to the UW campus.

User Three:

Task 1: Though the last user was able to complete the first task, she was very unsure about the first task because she did not know what certain symbols (the star, blue lights) meant.

Task 2: The last user successfully completed the second task, but only after some exploration. She initially used the function incorrectly, but noticed the proximity bar later and completed the task.

Task 3: User Three had a similar experience to User Two with the third task. Though she was able to complete the task, there was some initial confusion. Her general comment about the web application was that she does not read legends and therefore did not find that useful.

Summary:

- Our interface lacked a clear back button.
- All users completed Task 1 and 3, but only two out of three users completed Task 2. Therefore, the “Find friends” interface requires the most improvement. Its existing features should be more clearly displayed and features like finding multiple friends should be added.
- Navigating to the mobile map is possible from four different situations (directly from the main menu, by clicking on an alert, by clicking on a friend’s location, and from the UW Resources). Users were confused about why the maps resulting from each of those situations were almost identical, when ideally the map should be customized for every situation.
- Users were not adequately encouraged to explore the web application’s map. Also, users were not sure what to do with the map’s legend and “Crime Filter” tab.
- Some safety terms or tools, such as “Emergency Blue Lights”, should be clarified for users who are unfamiliar with those concepts.

Returning to our testing plan, we made the following general measurements:

- **How easy was it for the user to start the task? Could they quickly choose which button from the main menu to select?** Users did not have problem navigating using our main menu.
- **Once they started the task, how quickly could they complete it? Did they navigate to many unnecessary screens, or did they use the quickest route to complete the task?** Users had varying experiences with task efficiency. Some users were too efficient (e.g. the third task was completed too quickly by the first user). No user, however, took too long to complete a task (user testing was completed within 20 minutes by all users).
- **Did users understand the features of the Husky Crime Guide that may be unfamiliar to them (the heat map, filter tab, and “Find friends” are probably new concepts to most people)?** Unfamiliar concepts (particularly Find Friends and Emergency Blue Lights) were difficult for users to understand and need to be

- improved.
- **How did users transition from the mobile application to the web version? Did they recognize how similar they were?** The transition was smooth, though we may have made too much of an effort to make the web version identical to the mobile version. Our interface would be improved by changing the web version so that it takes advantage of the larger screen.
- **Did the users encounter any dead ends where they were completely unsure of what to do next?** Some users did require light prompting to complete a task (particularly when they were unsure if the task was even completed). But, that was not an issue with our design; rather, our tasks were unclear to the users.

Interface Revision

Mobile Application Revisions: User testing indicated that the features of our mobile application should be revised in the following way:

- A clear back button should be added to the lower left screen of every function.
- “Find friends”: The Find Friends function’s changes are seen in Figure 3. The proximity bar was made more obvious because users often overlooked it before. When the user clicks on a friend, that friend’s information is expanded. This makes it more clear what happens when the user clicks on a friend and how the user can interact with that friend. Graying out offline users was made more clear and friends are sorted by first location and then name. A search box was added so that a user can look for a specific friend, since users often chose friends by name rather than location in user testing. Lastly, multiple friends can now be selected, which is what User One suggested.
- Map: The map should be customized based on how the user navigated to it. For example, if the user clicks on alert to see its location, only that crime should appear on the map. Or, if the user clicks on a friend to see their location, only that friend should appear on the map. An example of this can be seen in Figure 4.
- Helpful bubbles: As the user explores the interface for the first time, they should be helped by information bubbles. For example, if the user is looking at Blue Emergency Lights for the first time, a bubble explaining what that tool does would help the user. An example of this can be seen in Figure 5.

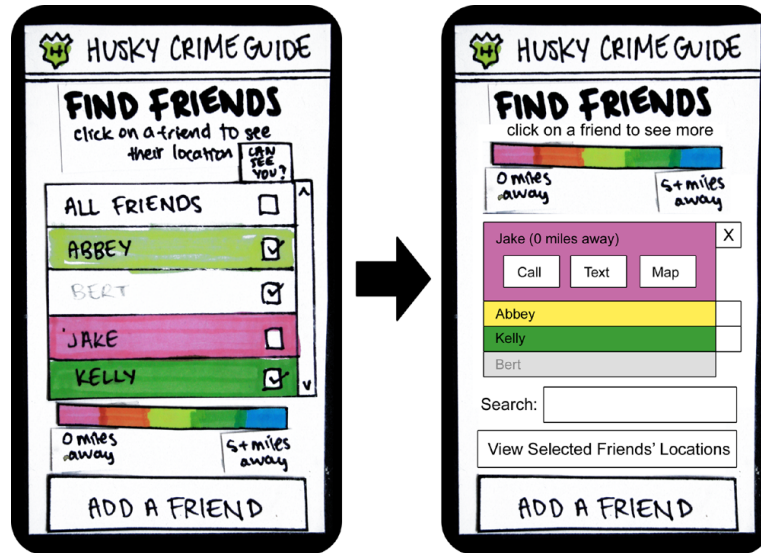


Figure 3: Find Friends revision to make the function more usable

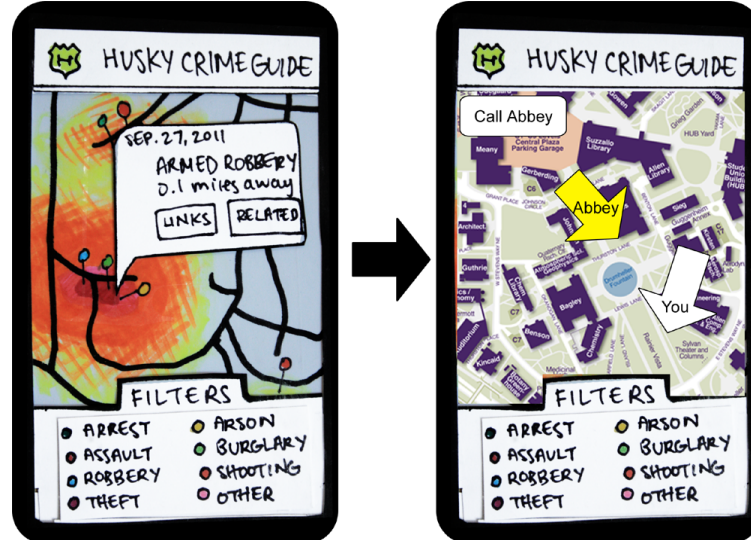


Figure 4: The map is customized based on how the user navigated to it. In this example, the user navigated to the map from Find Friends.

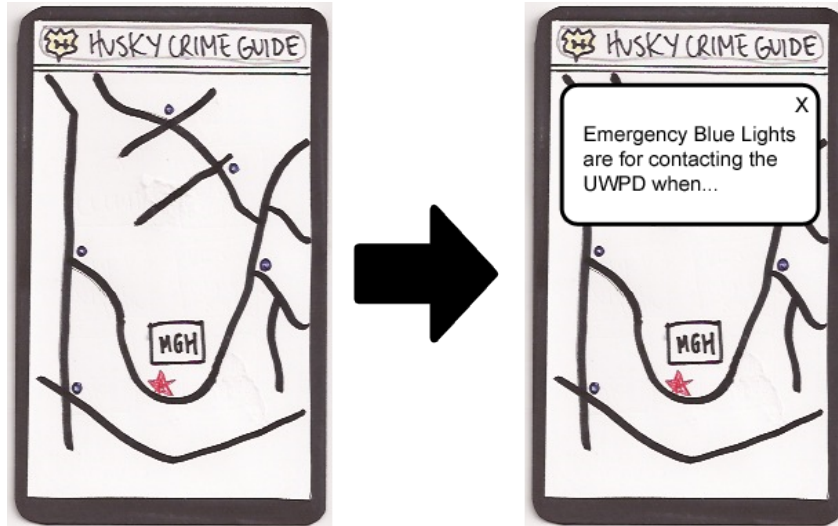


Figure 5: Temporary bubbles of information will help the user understand unfamiliar concepts.

Web Application Revisions: User testing revealed that users had trouble interacting with our web application. Specifically, they were unsure how to use the crime filter and legend. To solve these issues, we produced the following revisions (as seen in Figure 6):

- Removed the map legend
- Consolidated all filters and text to a left side-bar, similar to Google Maps' layout. This ensures that users can always see the filter options and crime types.

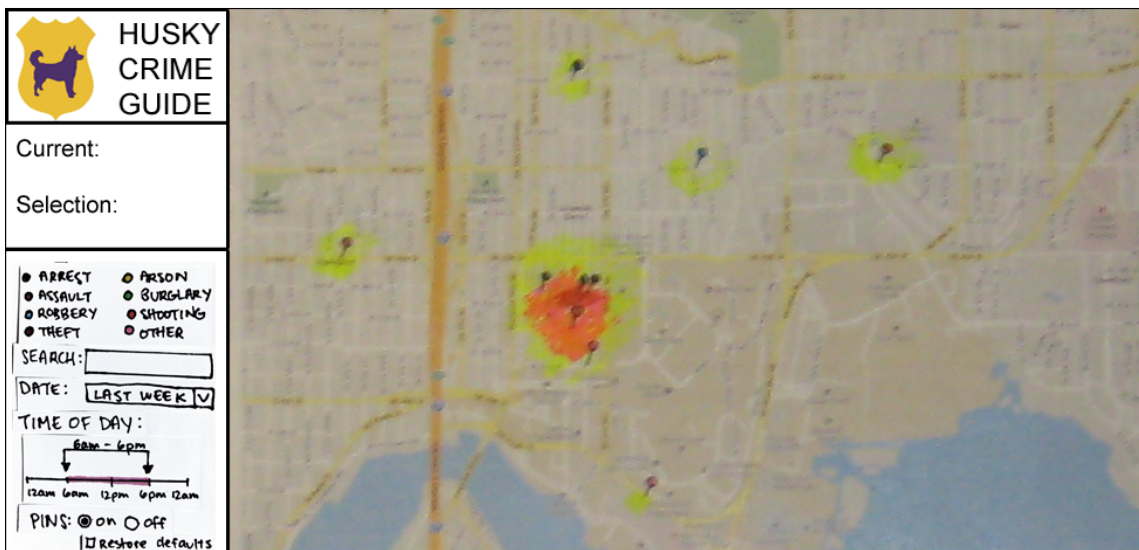


Figure 6: Web Application changes include a more obvious filter menu and the removal of the legend.

Discussion

Both talking to the UWPD last week and this week's user testing revealed many problems with not just the design of our interface, but also with our application's functions themselves. The issues that we encountered, however, were all solvable.

In resolving the problems that came up, our interface was streamlined as excess, unrealistic functions were removed. We learned the following from the UWPD:

- Although certain functions are theoretically sound, actually implementing them may be impossible due to constraints of the current system. This was especially relevant when trying to tackle the problem of students receiving delayed alerts. Because reports take time to be filed, the issue of timeliness is out of the hands of the UWPD and definitely not something that the Husky Crime Guide could solve. Or, since the logistics of the Panic Button could not be resolved, this was also a function we had to re-think.
- Despite the potentially drawbacks from speaking with the UWPD, we do not believe that removing live alerts or the Panic Button detrimentally affects our application. Our original design definitely erred on the side of “the more functions the better”, so removing that excess functionality allowed us to focus on more important design decisions.

We learned the following from user testing:

- Working with users taught us that users will often overlook parts of the interface that are obvious to the designer. For instance, the Find Friends proximity bar was very obvious as we designed it, but was often ignored during user testing. Or, the intuition that to see crimes the user needs to create a crime filter was not something that most users had.
- Contrarily, working with users also taught us that users will often examine parts of the interface that the designer overlooked. Our users did a lot more exploring of the map’s pins and Crime Report list than we expected. For example, clicking on every pin on the map was not supported by our paper prototype, unfortunately for some users. This aspect of user testing was particularly difficult to implement with a paper prototype, since we couldn’t create a screen for the infinite number of things the user could click on.

In summary, we greatly improved the practicality of our application by talking to the UWPD. We also refined our functions to be more accessible and intuitive by conducting user testing. Yet, despite having learned much from the UWPD and users, we expect that more issues will come up when implementing a high fidelity version of our application. Because the problems that people come up with are usually much different than the problems that technology creates, we expect that coding this application will reveal more improvements to our applications.

Appendix

Demo script:

This user study is being conducted to test the effectiveness of a low-fidelity prototype of the Husky Crime Guide mobile application. Your goal in the study will be to complete three tasks using the paper interface representing a smart phone interface. The prototype possesses all the functionality of a real smart phone, so to interact with the interface simply touch the paper with your finger. While working on the tasks, please try to think out loud and voice your thought process or any confusions that arise. Finally, remember that this is a low-fidelity prototype of a design and that any mistakes or bugs in the interface are a result of our design and do not in any way reflect your skills in completing this task. If you have any questions about the task please ask them right now, as you will not be able to ask task related questions

once the experiment begins.

Tasks (as handed out to the users):

Task 1

It is 11:00pm and you are finally leaving the library to go home. Before leaving the library you want to check you phone for any Timely Warnings and also consult the Emergency Blue Light map to gain more awareness of your surroundings as you walk home. Please use the phone prototype to complete this task, speaking out loud to explain your steps.

Task 2

It is 11:00pm and you are leaving the library to go home. As you are packing up you receive an alert about a crime that has recently occurred in the University District area. You don't walk to walk home by yourself, so you need to use the Husky Crime Guide application to see if you can find your nearest friend to walk home with. Please use the HCG application to complete this task and speaking out loud to explain your steps.

Task 3

You were thinking of finding an apartment around the University Village area, however you want to make sure that the area is a safe place to live. Using the Husky Crime Guide web interface, try to identify a safer part of the University District area. The application can be accessed through myUW. Once you identify the area, explain your reasoning for why you choose that specific area.

Critical Incidents:

User One:

Task 1:

- Instead of using the "Crime Reports" function, user one clicked on the map to view recent crime activity. With the map, he tapped on the pins that were closest to his route home in order to see more information on recent crimes.
- He correctly used the map filter to turn on the Blue Emergency Lights, although he did say that he had no idea what those were for.
- We have no back button.
- We do not inform the user what the Emergency Blue Lights are for.

Task 2:

- He didn't understand the proximity scale and proceeded to choose the friend arbitrarily: e.g. "Don't like Kelly...I'm going to choose Bert."
- He also didn't understand that "Bert" was unavailable since he was faded out (white background and pencil) This may be due to the low-fidelity of the interface. However after he didn't receive any feedback by clicking on "Bert" he assumed that Bert was not nearby.
- User One asked about a commit button and a search function to find a

friend.

- He misunderstood what the purpose of the check buttons were and thought they were for viewing multiple friends.
- He said it was not clear where he was supposed to click to call a friend versus see them on the map.
- After finding “Jake” on the map, he wanted to call him right away. But, that was not currently possible.
- User One also suggested that he did not like that crimes and friends were displayed simultaneously.

Task 3:

- He didn’t explore the filter or any of the features on this interface because it already defaults to the last 10 crimes and he did not feel the need to explore further.²
- He used this map to identify Laurelhurst as a safe area.

User Two:

Task 1:

- She chose to read information about both the Notifications and Timely Warnings. She also clicked on more crimes to find out more information, which the other users did not do.

Task 2:

- She was able to easily interpret the proximity scale and correctly called the nearest friend. In order to see the Emergency Blue Lights, she used the UW Resources function.
- She wanted to click on the blue lights on the map, but our interface does not support that function.
- She said that she wouldn’t use this feature, but would just call someone directly.

Task 3:

- Her initial reaction to the blank screen was believing that there were no crimes in the U-District.
- Once she started to filter her results, she chose to view all crimes in the last 2 years. User Two did click on the pins to learn more and explored multiple pins. But, her final decision about where to live was not crime related. Instead, she made her decision based on if the place was on a main intersection and its access to the UW campus.

User Three:

Task 1:

- User didn’t understand the meaning of the star on the map. She was not sure if that represented her location, or something else.
- She successfully turned on the Emergency Blue Lights by choosing it from the filter menu, but was generally unsure what they meant or how to use that information.

Task 2:

- She first clicked on Abbey (the second-nearest friend), because she initially thought she was the nearest since Abbey was near the top of

² Note: After the first user, we chose to change the default of the crime map from displaying the last 10 crimes to displaying no crimes at all. This forces the user to find crimes on their own.

the list. After looking around a bit, she then realized that she should have click on Jake because the proximity scale said he was the closest.

Task 3:

- She also assumed that there was no crime because no pins appeared on the page even though the pins were turned on.
- Although the user was unsure about what she could interact with, she eventually used the filter to add crimes to the map and identified Laurelhurst as a safe area.
- Her general comment about the web application was that she does not read legends and therefore did not find that useful.