F. Refine:
Medium Fidelity Prototype

Introduction

This report outlines the development of U-HUB, specifically the focus, approach, and description of our medium-fidelity prototype. It reflects design enhancements and changes based on user and teaching staff feedback. Ultimately, our focus was on improving user experience and interactivity.

Prototype Focus

Focus Areas

After conducting our user test, we discovered a few critical issues which became the primary focus of our med-fi prototype. The map interface, arguably the linchpin of our prototype, was cluttered and proved confusing for users. We decided to alleviate this by adding a legend to our filters, removing an underutilized creation button, adding onboarding instructions, and updating icons for our map buttons. The map became the most vertical and highest fidelity aspect of our prototype.

After tackling the above issues, we decided to add pathways to the map based on professor feedback. Foot traffic and bike paths were implemented, as opposed to incident heatmaps, since they better reflect important safety issues and provide additional novel functionality. Furthermore, the SOS flow was made vertical by adding an end-to-end interaction involving the user receiving an emergency chat message and making the active locations of security officers visible on the map.

Finally, we discovered that the report incident flow was too brief and provided insufficient feedback. We decided to build an end-to-end flow where users can follow-up with reported incidents. The chat interface and share location functionalities were left as horizontal elements, both proving too difficult to realistically implement through Figma. We considered using Wizard of Oz for the chat, but decided against it seeing as most users, once familiar with the prototype, preferred the map.

Prototyping Platform

As mentioned above, we decided to use Figma to build our low and med-fi prototypes. This was chosen due to its ease of use, reasonable learning curve, and depth of functionality. Furthermore, some of us were familiar with Figma, having used it previously in industry. Another reason for using Figma was that it is well-suited for designing mobile applications, which was our chosen interface type. However, complex interactions, like chat and location sharing, proved too difficult to achieve.

Design Approach Justification

The Map Interface

The first major design decision we had to make was deciding which interface would function as the primary search modality for users. As we learned through cognitive walkthroughs and user testing, this was highly dependent on the type of user. Younger, tech-savvy users were more likely to intuitively interact with the map interface, having been exposed to similar interfaces before.

Conversely, older users found the map interface overwhelming and often, initially, navigated the prototype through the chat. Once users better understood the conceptual model, however, it appeared that the map was the preferred searching modality, providing a stronger metaphor for campus security. As a result, we decided to make the map vertical and keep the chat horizontal.

Emergency SOS

Many users, specifically during the med-fi walkthrough, brought up concerns regarding bad actors abusing the app. Because one can see the active locations of security officers, it would, therefore, be easy to avoid them. Furthermore, the SOS functionality proved confusing for users: who exactly was being alerted? While we initially wanted to keep this functionality horizontal, we decided to make it vertical to better reinforce the relationship between users and security officers. Therefore, an end-to-end interaction was built where, upon triggering an SOS, users receive a message from a security officer and both the user's and security officer's locations are made visible. In doing so, we were able to solve the problem regarding bad actors and improve understanding of this flow.

Incidents & Reporting

Another disconnect users encountered was regarding incidents and their relevance to the map interface and campus security. Most users we interviewed and surveyed had never reported an incident before and were unaware that this service already existed. Moreover, our report incident flow was too brief - only providing inputs for date, time, and description - and provided insufficient feedback. To reinforce the relationship between users, incidents, and the map, we decided to implement a vertical, end-to-end report incident flow. After reporting incidents, users receive an alert and notification directing them to the incidents view. This view was designed to provide a way for users to follow-up on reported incidents, further reinforcing the user-to-incident relationship.

Filters & Pathways

The last major design decision we made during this phase was how to handle map filtering and if the filters we had included provided sufficient coverage of available resources. Understanding the importance of bike theft, we decided to make this a separate incident type from theft. Furthermore, as stated above, security officers were removed from the filters to prevent bad actors from abusing this. Lastly, while we had planned to add incident heatmaps, based on reported incidents, we opted instead to implement pathways: foot traffic and bike paths. The presence of others is a major factor in perceptions of safety and, therefore, it seemed logical and beneficial to include foot traffic. Users can visualize which paths are most popular and feel safer about walking on campus.

Prototype Description

Medium-Fidelity Prototype

- Figma prototype
- Walkthrough video

Task #1: Viewing Resources

Figure 1. This is the Map interface where each task example will begin. We can see several items on the map: bike storage, bus stops, blue phones, and friends. To view additional Resources, users can click the blue filter map button on the right-hand side of the map.

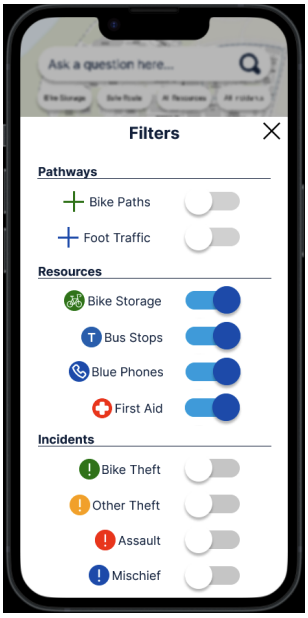

Figure 2. This is the Filters view where users can enable or disable different Pathways, Resources, or Incidents from appearing on the Map interface. By default, bike storage, bus stops, and blue phones are enabled. We will now enable the first aid Resource.

Figure 3. After closing the Filters view we are back at the Map interface. As we can see, the first aid Resources are now visible on the map alongside the other Resources. We will now select one of the bike storage Resources to view its details.

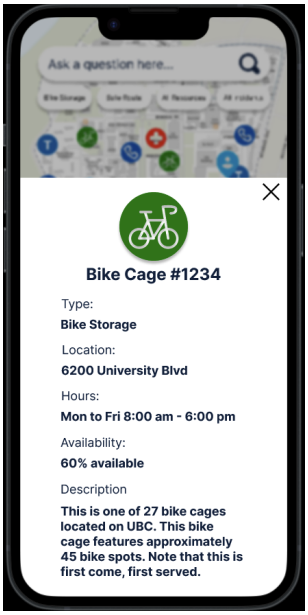

Figure 4. This is the Resource view where users can view information specific to a given Resource. In this case, we can see the hours this bike cage is accessible and how much space is remaining. This concludes the first task example.

Task #2: Viewing Incidents

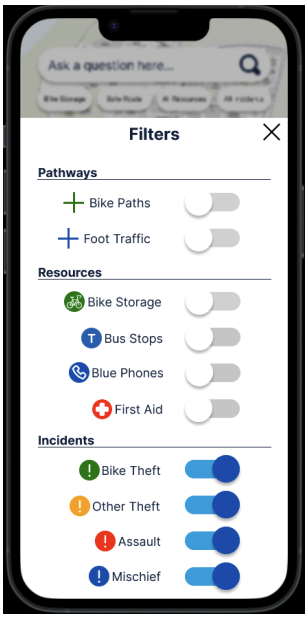

Figure 5. After clicking the blue filter map button we are back at the Filters view. From here we have disabled all Resources and enabled all Incidents. The following Incidents are supported in the prototype: bike theft, other theft, assault, and mischief.

Figure 6. After closing the Filters view we are back at the Map interface. All of the Incidents listed in the previous step now appear on the Map. We will now select one of the bike theft Incidents, displayed in green, to view its details.

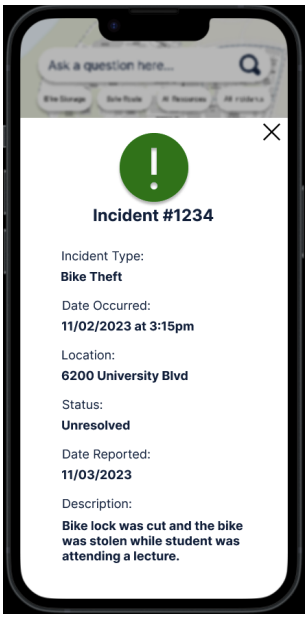

Figure 7. This is the Incident view where users can view information specific to a given Incident. In this case, we see the date and location this bike theft occurred, the current status, and a short description. This concludes the second task example.

Task #3: Viewing Pathways

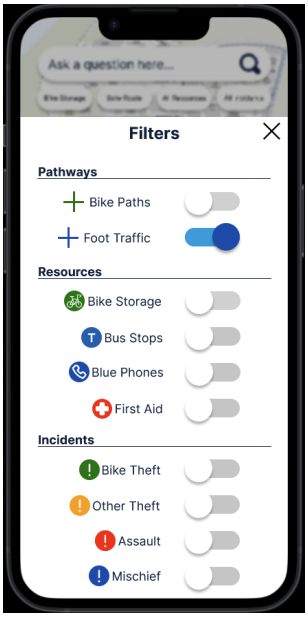

Figure 8. After clicking the blue filter map button we are back at the Filters view. From here we have disabled all Resources and Incidents and enabled foot traffic. The following Pathways are supported in the prototype: bike paths and foot traffic.

Figure 9. After closing the Filters view we are back at the Map interface. The foot traffic Pathways now appear on the Map. The darker the Pathway, the higher the foot traffic it experiences. Places on the edge of campus are lighter, as they experience less foot traffic.

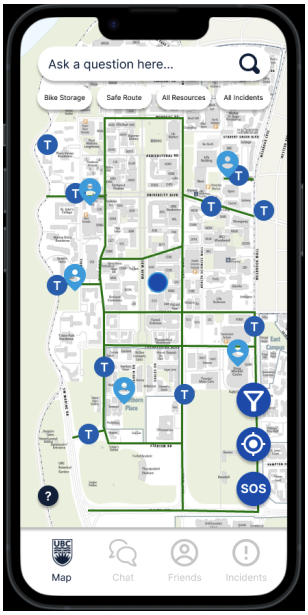

Figure 10. Alternatively, users can enable the bike path Pathways through the Filters view. Unlike foot traffic, bike paths are a solid color, as they indicate the location of bike paths, instead of their traffic. This concludes the third task example.

Task #4: Reporting an Incident

Figure 11. This is the Map interface that was documented above in Figure 1. Users looking to report an Incident can first navigate to the Incidents view using the navigation item located in the primary navigation bar at the bottom.

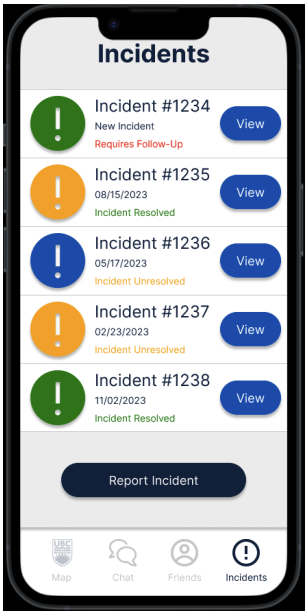

Figure 12. This is the Incidents view where users can view and follow-up on their previously reported Incidents. We can see some information summarized here, such as an Incident's number, date, and status. From here users can click the Report Incident button.

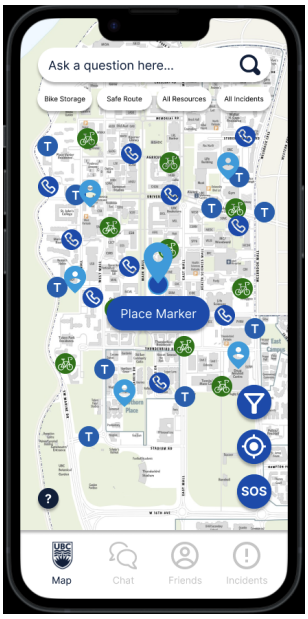

Figure 13. After clicking the Report Incident button, users will be asked to place a marker on the map indicating the location the Incident occurred. The marker is currently static, however users can click the Place Marker button to continue.

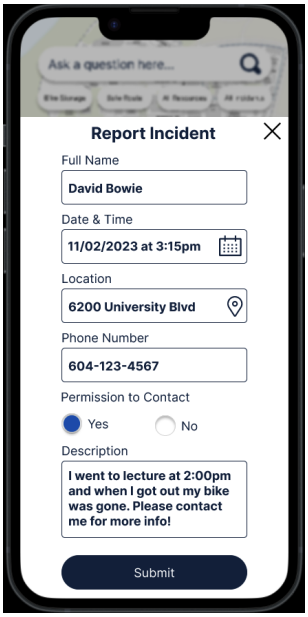

Figure 14. After placing the marker, users will be asked to provide additional information, such as their name, data and time, phone number, permission to contact, and a short description. Once completed users can click the Submit button.

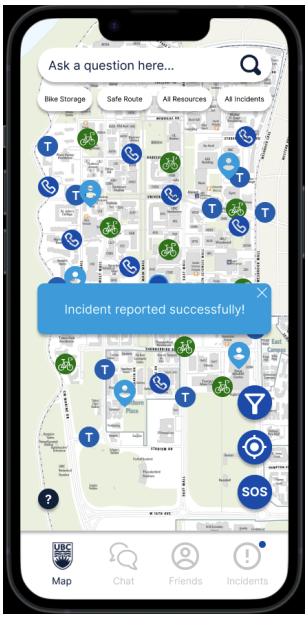

Figure 15. After submitting the Incident, users will receive an alert notification indicating that the Incident was successfully reported. Furthermore, users will see a notification on the Incidents navigation item. This concludes the fourth task example.

Task #5: Adding a Friend

Figure 16. This is the Map interface that was documented above in Figure 1. Users looking to add a Friend can first navigate to the Friends view using the navigation item located in the primary navigation bar at the bottom.

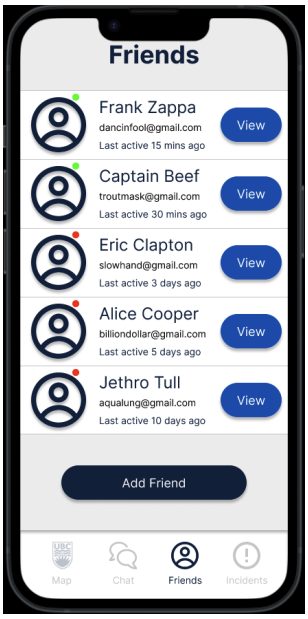

Figure 17. This is the Friends view where users can view their previously added Friends. We can see some information summarized here, such as a Friend's name, email, and last active time. From here users can click the Add Friend button.

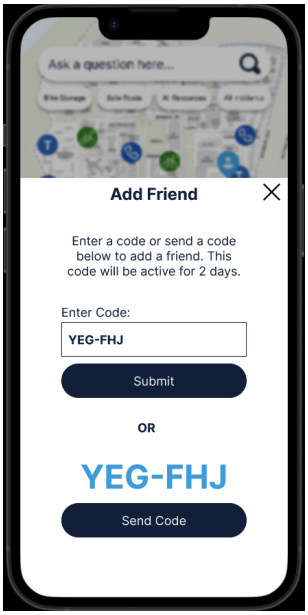

Figure 18. This is the Add Friend view. Users have two options for adding a Friend: entering a code or sending a code. The send code functionality is not implemented, however users can click the Submit button to add a Friend.

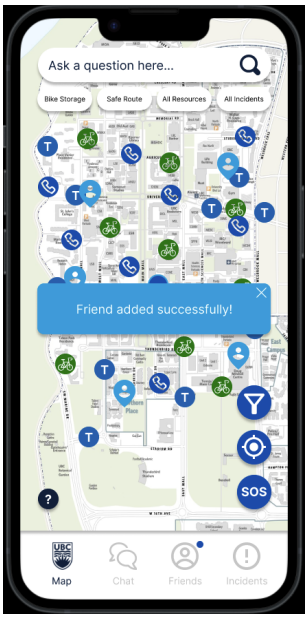

Figure 19. After adding a Friend, users will receive an alert notification indicating that the Friend was successfully added. Furthermore, users will see a notification on the Friends navigation item. This concludes the fifth task example.

Task #6: Sharing Location

Figure 20. This is the Map interface that was documented above in Figure 1. Users looking to share their location with Friends can click the blue target map button located beneath the filters button on the right-hand side of the map.

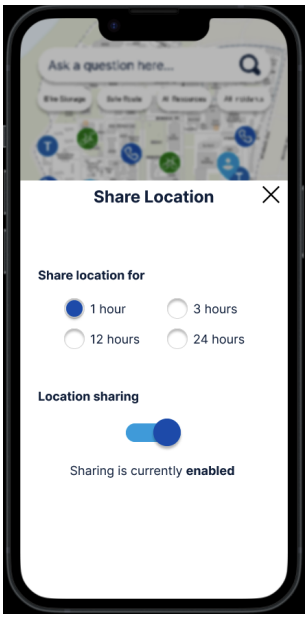

Figure 21. This is the Share Location view. As we can see, users can share their location for 1, 3, 12, and 24 hours. To enable location sharing, users can click the toggle at the bottom of this view. After this, users can close the Share Location view.

Figure 22. After sharing their location, users will see that their current location marker has changed color and is now bright green. Users can disable location sharing manually or wait for it to automatically disable. This concludes the sixth task example.

Task #7: Emergency SOS

Figure 23. This is the Map interface that was documented above in Figure 1. Users looking to trigger the Emergency SOS can click the blue SOS map button located beneath the target button on the right-hand side of the map.

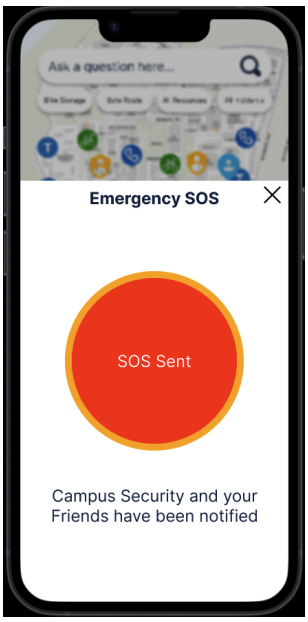

Figure 24. This is the Emergency SOS view. In this image we can see that the user has already triggered the SOS and that Campus Security and their Friends have been notified. After this, users can close the Emergency SOS view.

Figure 25. After triggering the SOS, users will see that their current location marker has changed color and is now bright red. Furthermore, users will see a notification on the Chat navigation item and will also see Security Officer active locations on the map.

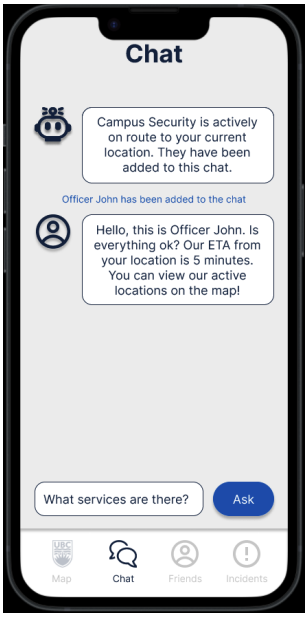

Figure 26. After opening the Chat view, users will see a confirmation of their SOS and will be able to communicate directly with a Security Officer. The Security Officer also provides an ETA for the user. This concludes the seventh task example.

Design Process Reflections

User Feedback Integration

Integrating user feedback was a pivotal part of our design process. Conducting user tests and reviewing feedback helped us refine the U-HUB prototype to better meet actual user needs. A good example of this is the filter and share icons. In the testing of the low-fi prototype, it became clear that the map icons were not easy to understand. In the in-class demo, however, our fellow students reported a good intuition of what they represented. If we were to approach this again, we would engage with a broader user base earlier in the development cycle in combination with more user testing. This would have provided a wider range of insights and helped us identify potential issues more quickly. Lastly, designing and testing feature-specific prototypes could have helped.

Balancing Innovation with Familiarity

During the development of U-HUB, we strategically incorporated familiar interfaces, like the map interface, to create a user-friendly experience. This choice proved vital in enhancing the prototype's intuitiveness and usability. It highlighted a key learning point of blending innovative features, like the chatbot, with well-established design elements in order to facilitate ease of adoption and satisfaction. This approach not only simplified the user interface but allowed us to focus on refining advanced functionalities within a familiar context. Another example of this is including end-to-end flows for the SOS and incident reporting functionalities. User disconnect led us to discover that another familiar construct - notifications and lists - provided necessary mapping to the prototype.

Safety, a Multidimensional Problem

When we first discussed Campus Security, we tackled various topics such as assault, theft, and harassment, recognizing the complexity of campus safety issues. Our literature review then uncovered even more dimensions we hadn't initially considered. In our low-fi prototype, we addressed these primary concerns, but in our med-fi prototype, we refined our approach. We improved the color-coding scheme for each incident type, including a legend, which enhanced clarity and usability. This change significantly boosted the prototype's intuitiveness, making it easier for users to identify and understand different incidents. Furthermore, including foot traffic pathways to the map interface, instead of incident heatmaps, provided another means of improving safety.

Design Justice Reflection

Design at the Margins

Our project initially aimed at addressing the needs of a broad user base. However, design justice encourages us to shift our focus towards marginalized groups. By reorienting our design to consider those at the periphery, we could potentially uncover unique challenges and innovate more inclusive solutions. This may involve engaging directly with communities who are often overlooked, ensuring that their voices and experiences are heard and using it to influence the design process.

Start with Yourself

Recognizing our own biases and perspectives is critical in the design process. Each team member brings their unique worldview, influenced by individual experiences and identities. Moving forward, we aim to conduct more introspective analyses of how our backgrounds influence our design choices and decision-making. This self-awareness could help us in revealing the biases we each have and assist us in creating solutions that are more empathetic to a diverse range of user needs.

Speak to the Future

Our project has addressed current needs, but design justice challenges us to also envision and speak to a future where equity is central. This means actively imagining and designing for a world where the disparities and inequities of the present are addressed. By adopting a forward-thinking approach, we could contribute to a design that not only meets today's needs, but also paves the way for a more equitable future. Ideally UBC considers this when improving their safety services.

Appendix

Appendix A. Team Contributions

- Luke worked on the Prototype Focus, Design Approach Justification, and Prototype Description sections
- Timo worked on the Intro and Design Process Reflection sections
- Aleks worked on the Design Process Reflection and Design Justice Reflection sections
- All teammates contributed towards developing the Medium-Fidelity Prototype

Appendix B. Important Changes

- Bike traffic and foot traffic pathways (see Task #3)
- End-to-end incident reporting flow (see Task #4)
- End-to-end SOS emergency flow (see Task #7)
- Security officer active location visibility (see Task #7)