BusAlerts

One Alert Away From Your Next Bus

Design: Kegham Bedoyan
Program Manager: Jia Le He
User Testing / Study: Sanjana Prasain
Writing: Viswanathan Kumaragurubaran

Introduction:

BusAlerts is an extension to OneBusAway. It will alert users about late/early arrival of their planned buses and also notify them if about current weather. This will allow users to avoid having to use the OneBusAway app every single time they need to travel from their routine bus stop. In this paper, we discuss our findings from observing a variety of users with different familiarities with OneBusAway. Several users were first time users of the app, while others were regular users. The users for the contextual inquiry were selected from different fields like professionals, students and retired employees. Also, this resulted into having people from different age group which is important to analyze their preference and see if we can come up with universal design without having to compromise anyone's preferences.

Problem and solution overview:

For people with public transportation as their main method of travel, OneBusAway has played an important role in the Puget Sound area by providing real time bus arrival information to such users of public transit systems like Metro, Sound Transit etc. However, as of now, users have to open their OneBusAway app in order to figure out the time for their next bus and/or also to see if they missed their bus, and if they do, when the next available bus arrives. If people are in the habit of taking the same bus around the same time every day, they might just come to their bus stop without even bothering to check the OneBusAway app, only to then find that their bus is half an hour late. We propose to address this problem by adding a feature which will provide alerts (browser based, text, e-mail and in-app alerts) if a scheduled bus is early or late. This way, users can plan their commute accordingly and avoid missing buses as well as unnecessarily waiting at their bus stops. Furthermore, users can get weather alerts to be better prepared for the adverse weather condition. Our proposed solution builds upon the existing framework provided by OneBusAway, and allows the user to set up individualized notification preferences.

Contextual Inquiry Participants:

We observed users from various groups: students, professional and retired professional. We selected a diverse group of users to observe and understand multiple views on the use of OneBusAway as well as new potential features.

User A: User A is a retired teacher and a first time user of OneBusAway. First of all, we showed him how to use OneBusAway on his Windows Mobile phone. After that, we observed him use the application at the bus stop University Way and NE 41st St South to take a bus to downtown Seattle. He opened the application and then went to the list of stops. There were two stops with the same name with difference in just in terms of direction. He selected the location to be South and then looked at the buses in that stop. The Windows Phone app has the map taking around upper 2/3rd of the screen and the lower part shows the list of the buses. There were couple buses with negative time and he thought that was helpful

to know if he had missed the bus. At first he said scrolling to see more list was not intuitive because scroll bar was not visible. After that he noted the time of the bus with least wait time for downtown Seattle and closed the app and put away his phone.

User B: User B is a student here at UW, and is also a first time user of OneBusAway. She does not take the bus regularly, but wants an application that would help her in case she does. We told her about the general functionality of OneBusAway, and let her explore the application on her own while we observed. She opened her app on her Android phone and she wants to find the best way to go from UW to Redmond next Thursday afternoon. However, since she rarely takes the bus, she did not know what was the best route. She tried searching "UW to Redmond" under Routes, but that did not return any results. We suggested she try the 542, and she tried again, and was able to see all the nearby stops with 542. She then clicked on the nearest bus stop with 542, and it showed that the last one left 4 minutes ago, and the next one would arrive in 26 minutes. However, the arrival times were all current, and she wanted see the times for next Thursday. She became frustrated when she couldn't figure out how to do this, and closed the application.

User C: User C is a UW student who is familiar with mobile apps concerning travel. He owns a car and uses it often, but still relies on the bus to get on campus. Because of this, he is not very familiar with bus routes and prefers to use apps that allow users to plug in a current location and destination point to figure out where to go. Even with these preferences, while waiting for his routine bus to get back home, User C found it natural to take out his phone and quickly look up the arrival time of his bus on OneBusAway. User C stated that checking a bus delay was the only thing he uses OneBusAway for.

User D: User D is a Professor at the University of Washington. He uses the bus every day to travel from his house by 25th Ave NE to the University. He has been a user of the One Bus Away application installed on the iPod Touch for the past two years. The user may be classified as an expert user who is aware of all the features in the application, but he mostly sticks to bookmarks saved for the starting point and destination. He typically uses the application in his office and over the kitchen counter at his house mainly because he does not use a smart phone with a data connection and depends on the wireless LAN connection available on campus and at home.
While observing him use the application, we asked him to perform a typical task. He turns his iPod on and faces issues with the Wireless connection not being found for about 30 seconds. Once the connection is established he chooses the bookmark that has been saved for the stop from the University and updates it. While doing so, he receives the updated arrival information for his bus. He also never consults the map. He rarely uses the search feature because he has his stops bookmarked. He also believes he has no problems with privacy since the information he provides to the application is already available in the public domain (such as his address). Being a seasoned user, he does not spend more than a minute on the application.

Contextual Inquiry Results:

User A: After observing him use the phone, we asked him couple of questions about his first time

experience with the app. He said learning how to use it was really easy, and he will use it for future. He added that in the cold weather, he can avoid having to stand on the bus stop by using the app and getting there to make it on time for the bus. While asked about if he would like to have additional feature of email and/or phone alert for bus notification, he said he would prefer that to opening app each time for the use. Furthermore, he considered weather alert to be critically important as he will rather change his plan than travel in bad weather. While asking him about any additional comment about OneBusAway and additional feature we plan to add, he said it would nice if he can use his current and destination location and get list of all the buses he need to take just like Google maps with real time bus arrival information.

User B: User B stated that this app would be useful if a bus-rider already knew the routes they would take, but it would have been much more useful to her if OneBusAway allowed her to easily search for routes. She said she would have liked some feature similar to Google Maps where she could type in starting and destination points, and be provided with a list of potential routes. She liked having the real-time arrival information. However, she found it hard to navigate the application. When asked about her opinion on alerts, she stated that it might be a nice feature for frequent bus riders, but was unsure as to how it would work for her. For instance, she would want the set-up process to be quick and easy, and would not want to be sent notifications that she does not want.

User C: User C obviously has experience with commute-based apps. He stated that OneBusAway was useful, but limited overall for his needs. Instead, he prefers to use iOS's built in Map app, which also displays bus arrival times but in an arguably easier to navigate map setting. OneBusAway also has a map interface, but User C noted that it was cluttered with stops and he didn't find the route maps useful enough. Already aware that OneBusAway does not include these 'trip planning' features, I asked if including features similar to iOS's Map app would convince User C to swtich to OneBusAway for planning bus routes. User C was not swayed by this proposition, revealing that simply adding navigation features would not make OneBusAway much more appealing over other apps. Fortunately, User C liked the idea of an alert system. He said that having bus arrivals being sent in text messages would be a more convenient application of OneBusAway. He especially liked a scenario where he could be planning future trips with a different app, but still get notified when he should be heading to his next bus.

User D: This user is an expert with 2 years of app usage experience. However, the use case is special since it does not fall under the category of smart-phones (the user prefers to use the iPod and does not own a smartphone). The user often mentions that he depends on the Wireless LAN connection and the application works very well for routine and oft repeated routes (in this case the commute from home to the University). The user had a few suggestions that he believed will make his experience better. He suggested that providing information such as bus frequency will help him in circumstances when he decides to plan his travel in advance. He also could not understand the meaning of stop numbers and felt that they could be replaced with something more meaningful than just numbers. On occasion, he has had issues with information he terms "Phantom buses" - buses that are listed on the schedule as approaching the stop but eventually never appear. Another feature that he believes he could use is offline caching of schedule information during scenarios where a Wireless connection is unavailable for his use (such as tunnels and isolated stops without a valid accessible WiFi connection). In general the

user is very happy with the app for his every day usage and believes that further work will only empower users.

Tasks:

Some of the tasks for existing OneBusAway app includes looking for the nearest stops and finding the buses to the destination. In most cases, it seemed like people already know the bus number to take. If not, they use another source like google map to find the buses to take and then use OneBusAway to get the real time bus arrival information. Thus observing this and with the concerns of the participants, we realize that for our additional features to work best, we might have to consider adding the ability for OneBusAway to find the direction from Point A to Point B. Our list of task below is dependent on the assumption that our app will have this ability.

TASK A: Alex is a student at UW living in the U-district. He works part time in downtown Seattle's At&t Store and commutes every weekday from NE 41st and University way. He works in the afternoon from 1 pm to 4 pm each weekday. He wants to set up reoccurring alerts for his bus from the U-District to Downtown Seattle at 12:30pm as well as the return trip at 4:15pm every weekday.

This task is an example of a basic task where the user signs up/imports his calendar schedule to allow for bus alerts. This includes creating an account, indicating his preference on how he wants to be alerted -- either through email or phone, and when he wants to be alerted.

TASK B: Amanda is a lawyer with low vision which prevents her from driving a car. She lives in Redmond, and she takes the bus to work everyday from the Downtown Seattle. She takes bus 542 daily and has the alert set for that. One day, on the way back when she was couple minutes remaining from reaching to the Montlake Boulevard Stop, she received a call from her mom and had to rush to Downtown Seattle. Amanda texts BusAlerts with the time she estimates to arrive at Montlake in 5:10 and her destination of Downtown Seattle. She will receive a text back with the next bus with real time information that will take her to Downtown Seattle. Since Amanda is already the user of this app, she does not need to create account for this one. She basically have to send the text as mentioned here.

TASK C: Becky is a Civil Engineer in a startup company who lives in downtown Seattle. She does not have her license so she commutes with Sound Transit every weekdays to her work in Redmond using 545. She has to go to sites quite often -- sometimes it is last minute. Today, she has to arrive at the site in Kirkland in another 2 hours to look at the land plot. But before that, she has to prepare a short proposal to show it to her client. She is a regular user of BusAlert. Thus, since she will be working on her proposal, she decides to set an alert for getting from Redmond to Kirkland so that she knows if she has to make any changes to her travel.

This task will not require her to create account since she already has an account. She will add an on

time alert. Becky will put in her current location and final destination and the time she has to arrive at Kirkland. BusAlerts will have to alert her with buses she has to take since there is no direct bus to Kirkland. In this case, with the real time change in her first bus [say Bus A], BusAlert will have to update the time of second bus [Bus B] or in some cases suggest a completely different bus. In worst case, if there is change in time of Bus A that might result into missing Bus B and having no alternative buses, she has to be suggested to take a cab or find some alternatives.

Conclusion:

After observing four prospective users with the current OneBusAway application, we saw that they were generally favorable to the idea of an alert system. However, we noted that different users had different schedules and needs, and therefore may want different types of notifications with varying frequency and also option to opt out of notification if it is same schedule everyday. This is something that we will need to keep in mind and incorporate into our designs. We also learned that different people have different privacy concerns so we need to provide various options related to how much of personal details to be provided to the app for getting alerts. With the various methods of communication that are currently available to people, our alerts need to be delivered through different interfaces to accommodate all of our users.

Sketches of Design:

Design 1: Mobile Alert Settings and Alert Map

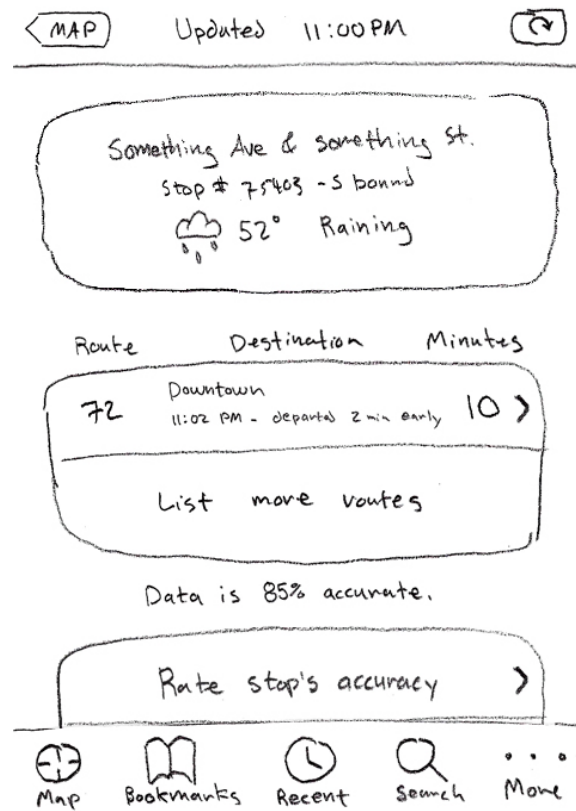Fig 1.1: Accessing Notification Settings through the More Page

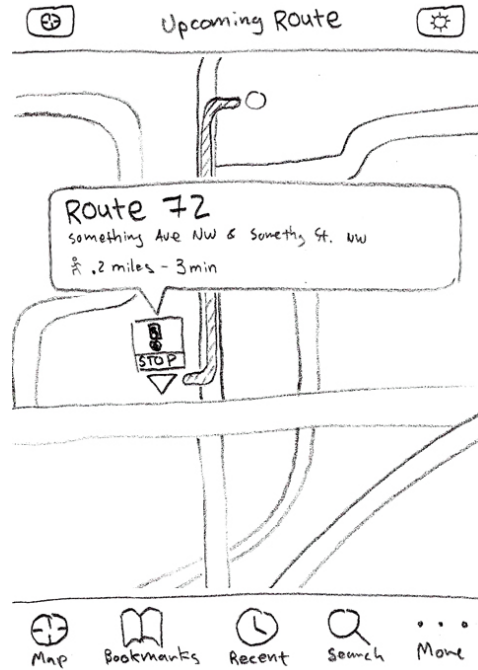Fig 1.2: Stop information with alerted bus route shown along with weather satus and data accuracy

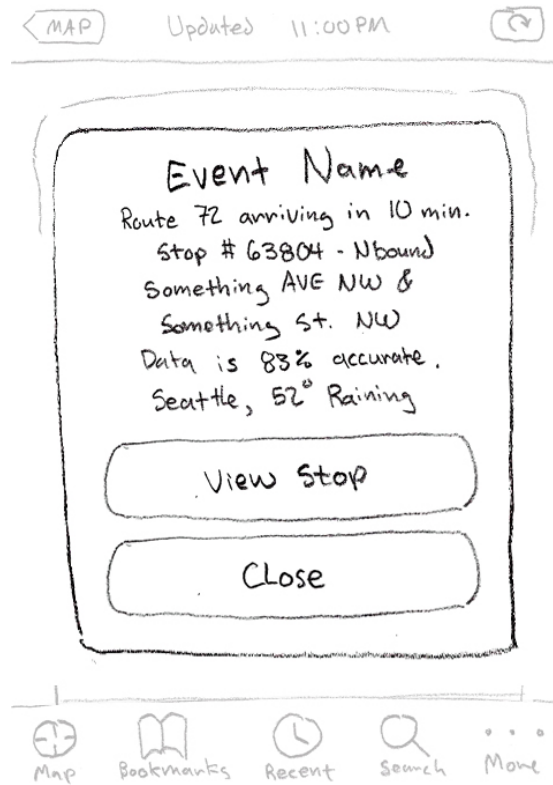Fig 1.3: Map of alerted bus stop and distance and time to stop

Fig 1.4: iOS notification for alerted bus stop

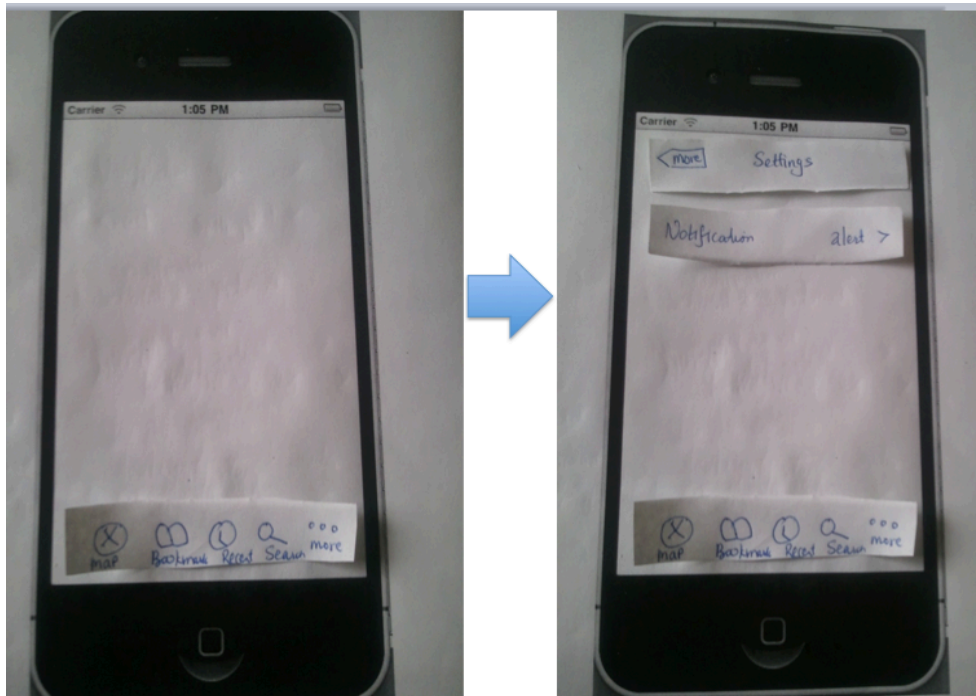**Design 2: Mobile Alert Settings and Alert Bookmarking**

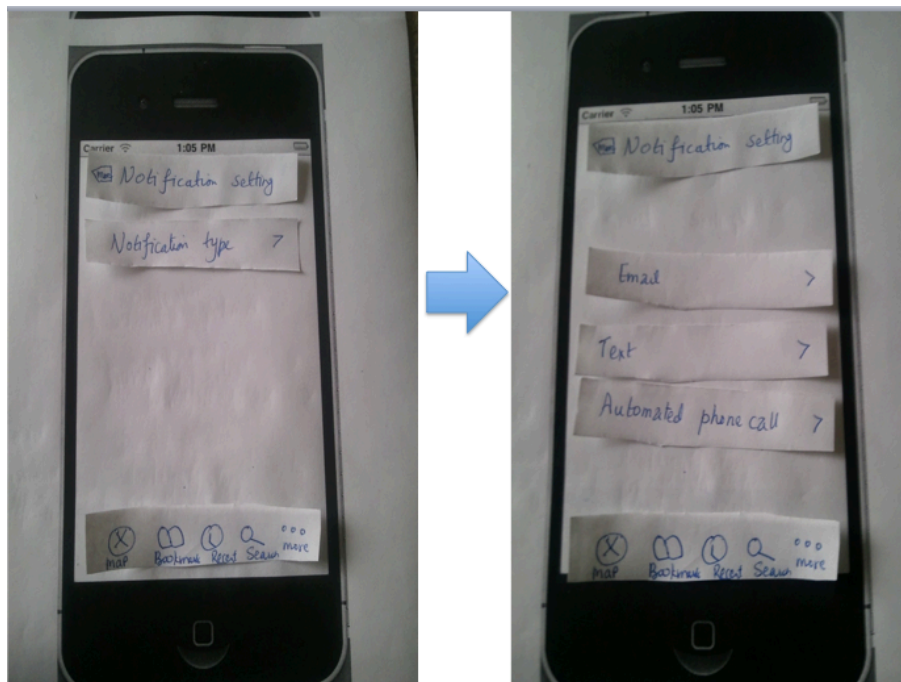Fig 2.1: Adding Notification to Settings to set up email/phone number

Fig2.2: Three types of Notification: Email, text or automated Phone call based on preference
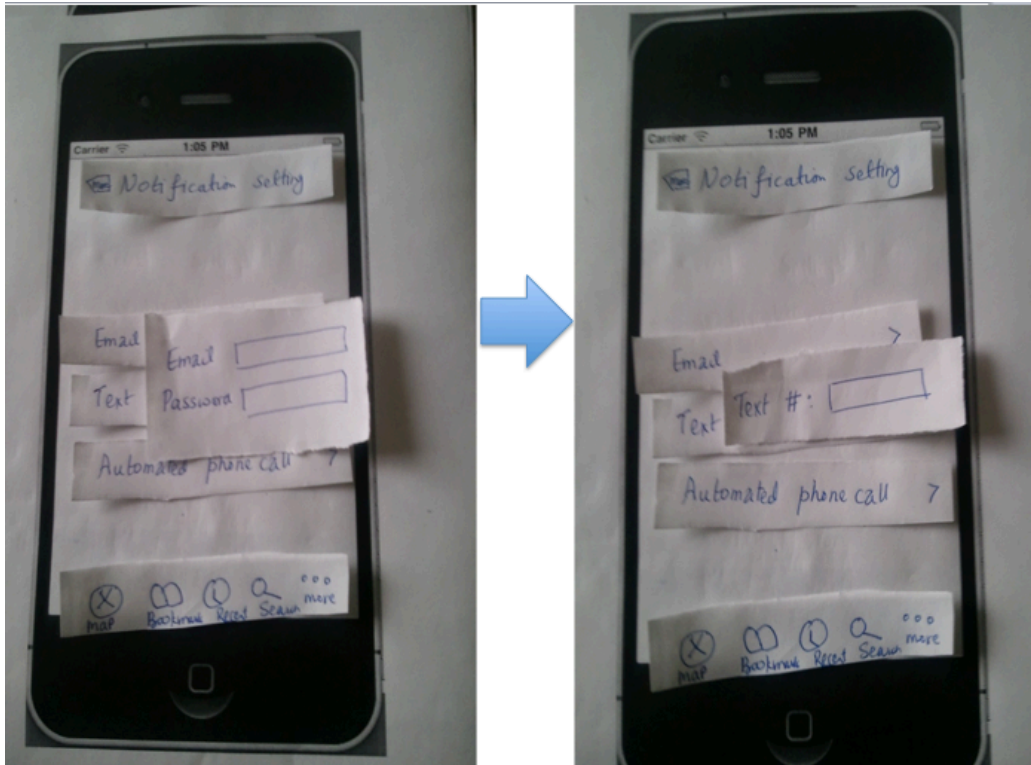
Fig 2.3: Setting up notification
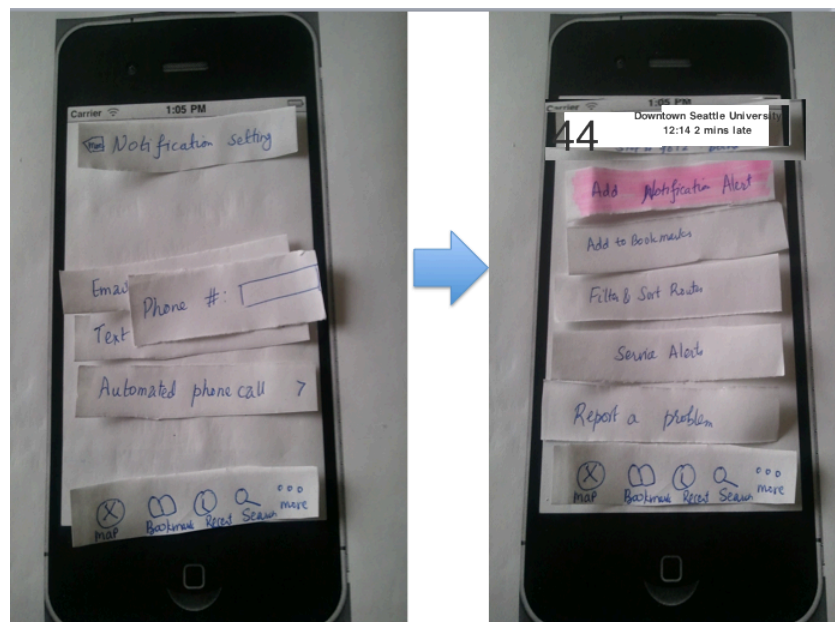

Fig2.4: When selecting some stop, there should be an added option to set up notification alert for certain stop

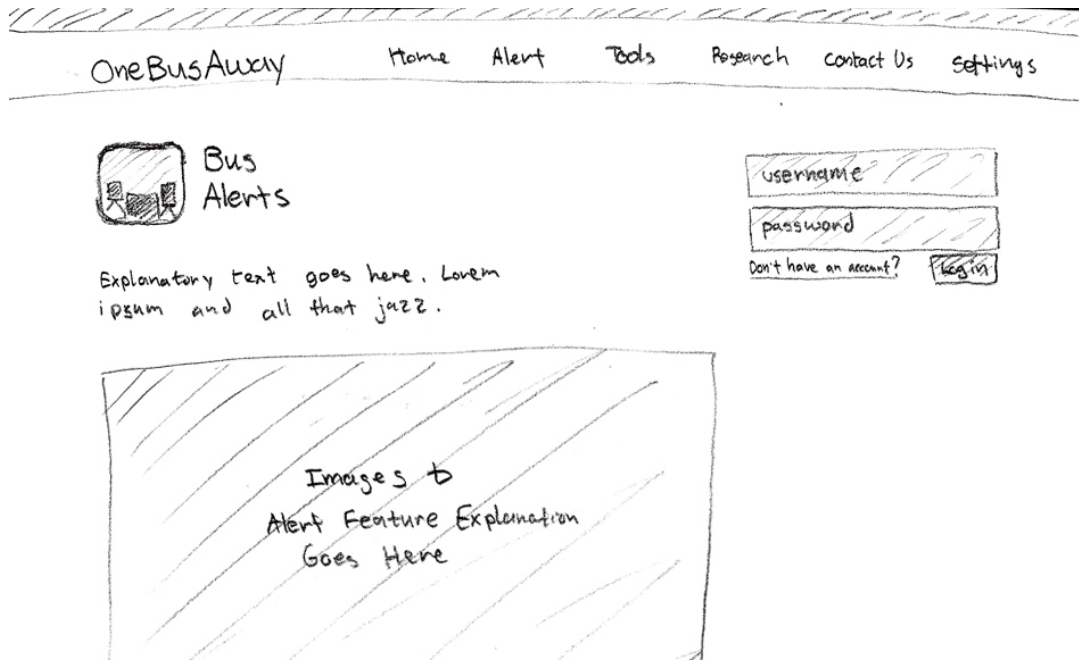**Design 3: Website for Bookmarking and Alerting Configuration**

Fig3.1: Login page and general information about BusAlerts

OneBusAway   Home   Alert   Tools   Research   Contact Us   Settings

Bus
Alerts

[+ Add Alert Method]   [+ Add Item]

Alert Methods

CALL: xxx · xxx - xxxx   ✹ Edit

EMAIL: ????@smail.com   ✹ Edit

Stop Bookmarks

Something Ave & Something St.
Stop #xxxxx   ⊕ Set Alert

Something Ave & Something St.
Stop #xxxxx   ⊕ Set Alert

Bus Alerts

[72] Something Ave & Something St,
      Stop # xxxxx   10:05 am

[72] Something Ave & Something St,
      Stop # xxxxx   10:05 am

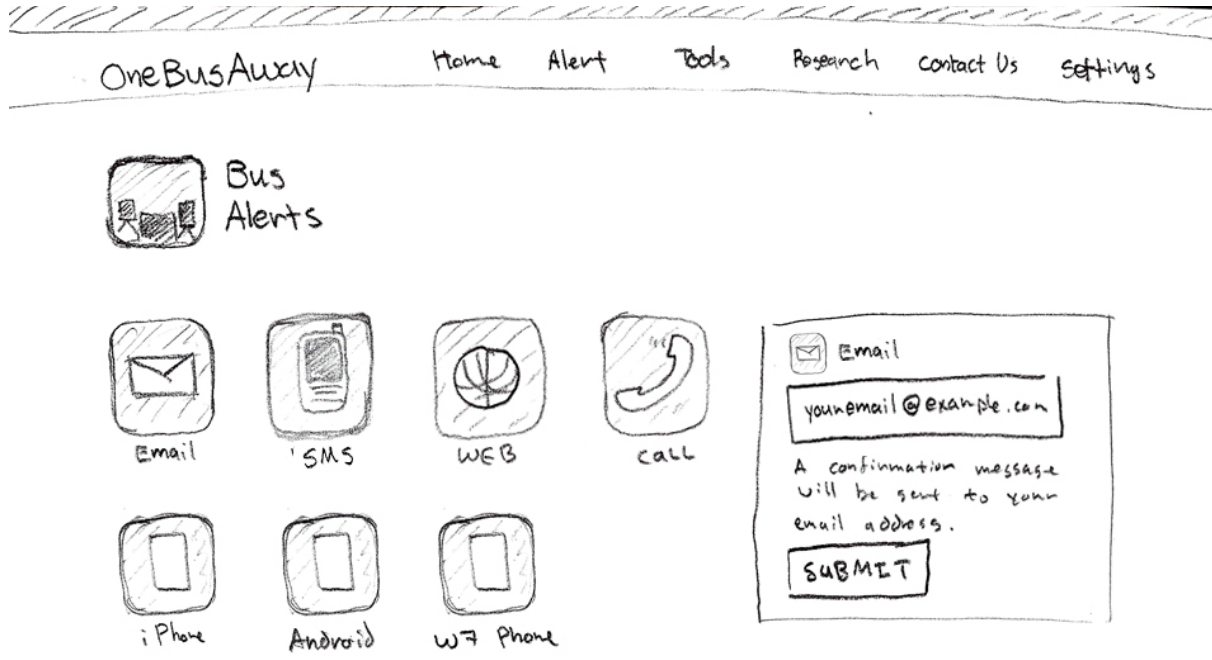Fig3.2: Profile page displaying saved alert methods as well as saved bookmarks and bus alerts
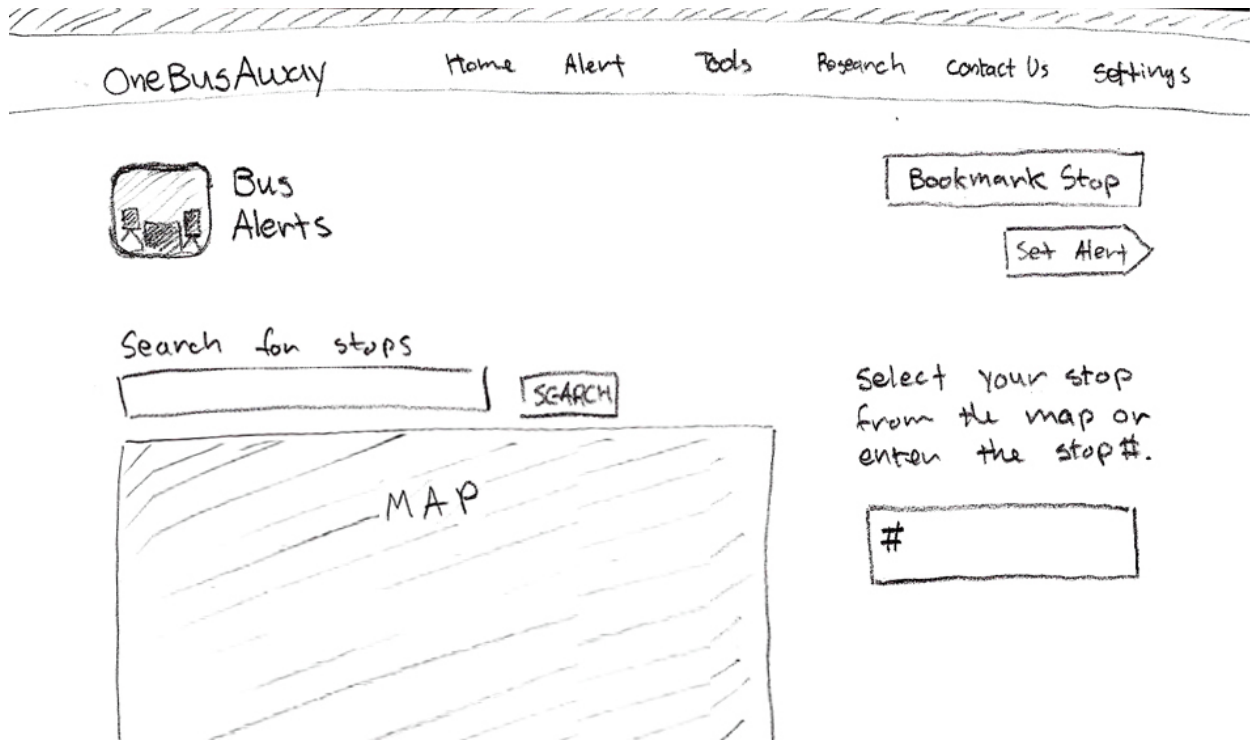
Fig3.3: Users can add various methods of notification

Fig3.4: Users can bookmark a stop, similar to the OneBusAway mobile app

OneBusAway   Home   Alert   Tools   Research   Contact Us   Settings

Bus Alerts

Add Alert

Setting up an alert allows you to receive notifications if your bus is early or late

| 72 | U-District |

Select your route and departure time.

| XX | Label Here |

00:00 am   00:00 am
00:00 am   00:00 am
00:00 pm   00:00 pm

☐ Alert me even if the bus is on time.

| XX | Label Here |

☐ Alert me with information about the next arriving bus.

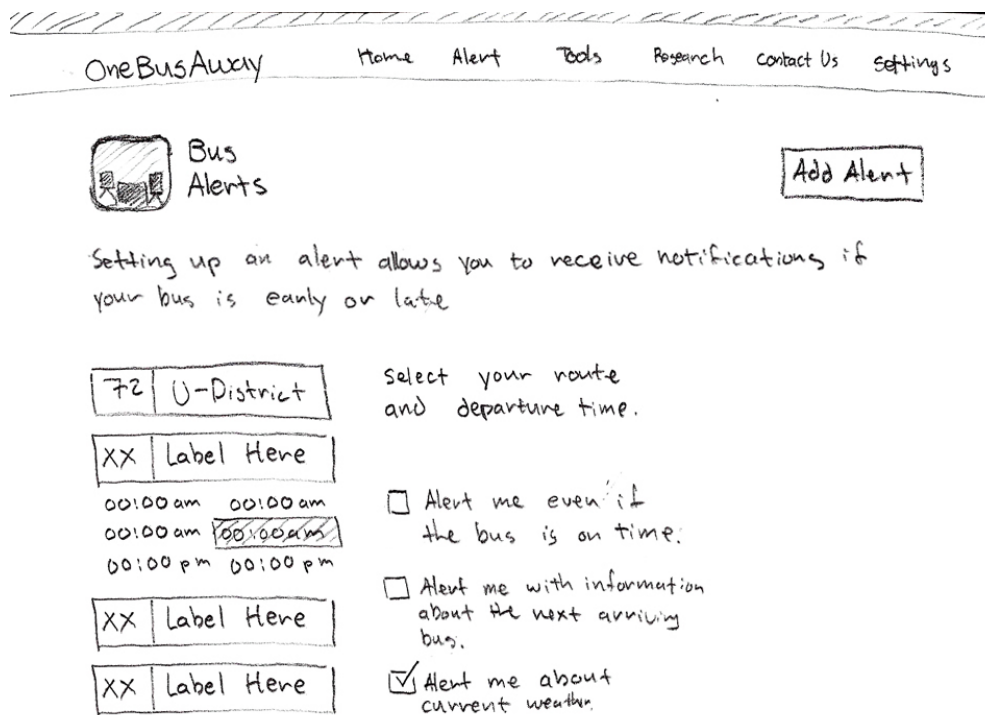| XX | Label Here |

☑ Alert me about current weather.

Fig3.5: Users can select a specific route and time as well as additional information to be alerted about