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Where's My Bus?

Vision

Anyone who consistently rides King County Metro buses has experienced delays in bus arrival times. An app called OneBusAway mitigates these problems for riders by using bus location data to estimate and report when buses will actually arrive at stops. Yet, when unusual circumstances arise, OneBusAway cannot always provide an accurate estimate of when a bus will arrive. For instance, if a tire on a bus is blown or if the trolley wheel of an electrically-powered bus comes off the overhead cable, OneBusAway may estimate the bus is ten minutes away based on location data and report that arrival time to users. However, given the situation, the bus will not actually move until the trolley wheel is reconnected to the cable or, in the case of the blown tire, the bus will likely not come at all. Without this information, OneBusAway users often become frustrated as they repeatedly check the app and see the bus will reportedly arrive in ten minutes when it actually will not come until much later.

With *Where's My Bus?*, we aim to inform riders about such unusual circumstances to help them understand why a bus may be stalled and better enable them to decide if they should delay their plans or find an alternate means of transportation. Riders can use *Where's My Bus?* to communicate about their experiences on the bus. For example, someone riding a 70 bus to Downtown Seattle Fairview whose tire was blown could search for that bus on *Where's My Bus?* by using the sample UI shown in Figure 1, click on that bus name, and post about the issue. Then, people waiting for that bus who have noticed an extended delay can check the same page to see if there are any potential problems with the bus and read the post about the blown tire. Alternatively, people waiting for a delayed bus can post a question on *Where's My Bus?* and other users can respond with information. Moreover, transit services like King County Metro can use *Where's My Bus?* to communicate with riders and post any alerts about certain routes, like if any buses will be rerouted due to construction, sporting events, or other reasons. With this information from *Where's My Bus?*, riders can then inform their employers or people they plan to meet that they will be late due to an extended bus delay or simply decide to look for alternate transportation.

No alternatives really exist that allow riders to find information about problems with their buses in the way we plan to do. OneBusAway estimates when buses will arrive at stops, but it does not offer users any information about unusual situations with buses and often does not give accurate estimates about bus arrival times in these cases. Transit services like King County Metro also have websites where they post alerts about bus routes. However, the information can be difficult to find on their websites, and typically these alerts only address issues foreseen ahead of time, like bus reroutes due to construction on major streets. Although King County Metro also provides a service for riders to sign up for email or text alerts about issues with specific bus routes, people do not necessarily want this information whenever King County Metro sends out an alert if they are not currently waiting for a bus. Furthermore, people who do not usually take a certain route cannot receive these alerts because they did not sign up for the service ahead of time. Finally, even though the aforementioned services do offer riders some information, they do not allow riders to communicate with each other, which may be the easiest way for people to learn about problems if transit services cannot release an alert or statement immediately.

Software Architecture

We plan to build *Where's My Bus?* as a mobile app. This way, people waiting for a bus can look at their phones to find relevant information posted on our app, and riders who have experienced an issue on the bus can post about the problem right after it happens. Ideally, we would hope to support all major mobile platforms, but due to the time and resource constraints of this course, we will develop for Android. The Android app will serve as the front-end of our system and will allow riders to post alerts and see them as well. For the back-end we will create a web API for submitting and retrieving the alerts and also for any other data that we need to use in our application. Finally, we will integrate with OneBusAway's API to get information about bus routes and other relevant information. This follows the MVC architecture in that our web API and the OneBusAway API function as the model for storing and retrieving data. Then, the Android app acts as both the view for presenting the data to the user and the controller by facilitating the interaction between the model and view.

Challenges and Risks

Although we would like to include transit services to provide official alerts and updates about problems, these services may not be interested in working with us. In these cases, we can focus on information obtained from users and try to incorporate alerts transit services already provide, like the alerts King County Metro communicates via their website and email or text subscriptions. In addition, users may post unwanted messages on *Where's My Bus?*, such as inventing information about problems that have not actually occurred or posting messages that do not remotely pertain to issues with buses. To encourage people to post genuine information, we can provide features where people can report if a message was helpful or if it was spam. Figure 2 shows a sample UI where a rider has posted that the 44 bus to Ballard has experienced a blown tire; eight users have given this comment a thumbs up to indicate the post was genuine and helpful, and no one has given it a thumbs down to show it is invalid. In addition, we may allow users to block messages they no longer wish to see to improve their experience with *Where's My Bus?*.
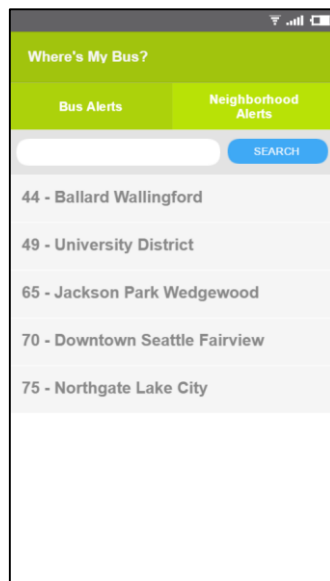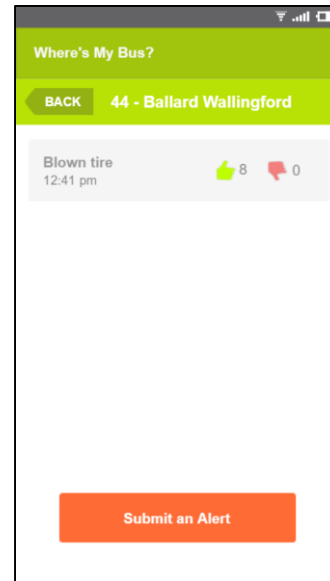

Figure 1.

Figure 2.