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For our user testing, we asked users to run through various use cases of our app. These included viewing the routes that stop at a bus stop on the map, viewing the location of a bus on the map, viewing alerts for a route and for a neighborhood, and posting an alert. The first user was also asked to initially explore the app as he normally would after downloading a new app before completing the aforementioned use cases.

The first user is a junior at the University of Washington majoring in Civil Engineering. He has no background in computer science and uses the King County Metro System sporadically. When using the app with Android Studio's emulator, he successfully completed all previously mentioned use cases. There was some difficulty using the maps on the emulator which somewhat hindered the test, but another user test was conducted on an android phone which was able to handle the map correctly. The only couple of bugs noticed were previously known and included in our issue tracker, and were minor layout problems like buttons being squished to the edge. He did discover a previously unknown settings button which no one on the team had run into before, as it was a default feature provided by Android Studio. He also suggested we change the color of some of the map markers to distinguish between bus stops and bus locations. Overall, this user liked the design of Where's My Bus, thought it was "pretty intuitive," and enjoyed using it. He would download and use this app (if he had an android phone).

The second user is also a junior at the University of Washington, studying microbiology. She has no background in computer science, with programming experience limited to using MATLAB in an applied mathematics course. She is a frequent user of the King County Metro System. She also tested Where's My Bus using Android Studio's emulator. She was asked to complete the same use cases as the first user, without the initially exploration of the app. She successfully viewed the routes that stop at bus stops near her apartment using the map view and viewed the location of one of those buses. She was also able to view the alerts for both routes and neighborhoods, and posted an alert about animals escaping the zoo. She noticed the same unused settings button as the first user, since this had not been changed between the tests. She liked the app, and said though she probably wouldn't post alerts very often, she would use it to view alerts others had posted. Like the first user, she does not have an android device.

The third tester is a 20 year old college student who frequently rides busses via the King Country Metro System. While he has some programming knowledge, it is limited and he didn't understand what was happening below the surface. The app was first introduced briefly as "a forum to post and view alerts that would cause buses to be late." Then the user was asked to use the app to cover the main use cases: post a route alert, view an Alert for the Ballard Neighborhood and leave a comment, favorite several routes and view by favorites only, and explore the map and find bus locations of Route 44. After covering the main use cases, the user was allowed to freely explore the app and, if possible, try to break it. This user suggested that if there are no alerts, have it display a message that says so, instead of a blank screen. He also

noticed that the help screen is very slow, and the settings in the top right menu doesn't do anything. He thought that having to exit the phone keyboard to submit a comment/alert was a little inconvenient, and we should consider having the enter button on keyboard submit. He also thought it was slightly confusing how the markers for a bus's location is the same as the markers for bus stops. However, he said all the above points were pretty minor issues, and he didn't see any major issues. Overall, he said the app was well designed and felt intuitive to use. He said he would give a 5/5 rating and he would probably download and use the app if people actually used it and posted alerts regularly.

Through conducting these user tests, we learned that our app had a settings button we were unaware of, but we had more reported issues than any testers of the app noticed. We learned that potential users like our app, and found it easy to use. They said they would get and use this app (if possible), and thought it has a good design. We also learned that user testing is best done on the actual target device, i.e., using an android phone provided a much better user experience than the Android Studio emulator, especially when it comes to maps. User evaluations are helpful to get feedback on product design and performance; it's a great way to find out what users really care about, and which features and bugs they don't care about or notice. It helped us reprioritize what needed to change before our next release.

After asking friends to test Where's My Bus, we found a few things to change. At the suggestion of our users, we changed the color of the markers for bus stops on our map so that they are different from the markers for bus locations. Bus location markers remained purple, matching the color of the button to view bus locations, and the bus stop markers were changed from purple to blue to match the color of the marker in the picture on the map button of the route page. All of our users noticed the settings button on the drop down menu in the upper right-hand corner which did nothing upon being clicked. Since discovering the existence of this menu option, we decided to replace settings with our help button. We then removed the navigation drawer (side menu), where help was previously housed on the main page. This menu was not accessible from most pages in the app, so was of less help than the near-ubiquitous dropdown menu with the settings option we edited. Thus, Where's My Bus is now more user-friendly since help can be accessed from most pages, and no longer has a confusing, unused settings option. We also changed the alert forum for a route or neighborhood to display a message saying no alerts have been submitted yet, rather than being blank when there are no alerts. This was a helpful suggestion from our users, and something that had confused us in testing as well, since it could be hard to tell if the page hadn't finished loading or if there were no alerts.