

Testing the Beta B/LV App with B/LV and Typical-Vision Individuals

Three B/LV individuals and three typical-vision individuals tested the B/LV app on Saturday, February 1, 2025. The test and interviews with the participants were conducted at the George Bush Drive and Penberthy Boulevard intersection on a sunny, warm afternoon. The script for the interviews is provided in a separate file. Two of the B/LV individuals had participated in the earlier online interviews. The third volunteered to participate after hearing about the test from one of the initial test participants. The other three individuals were TTI staff not involved in the project who volunteered to participate.

Each participant tested the app individually while standing on the sidewalk next to one end of the intersection's signalized crosswalk. Ambient roadway traffic was present on both of the intersecting roads throughout the testing process. TTI researchers at the traffic signal cabinet activated the illumination of the bus sign and the audible announcement when notified by the TTI researchers conducting the interviews. The following steps were taken in conducting the test of the beta app:

- TTI researchers explained the features of the app and the process for the test.
- The participant was handed an iPhone with the app activated.
- In the first case, the signal was activated simulating the entrance of a bus into the intersection. The simulated bus activated both the phone app (vibration and verbal announcement) and the bus sign and verbal announcement.
- In the second case, the signal was activated simulating the entrance of a bus into the intersection, but the verbal announcement was not activated. The simulated bus activated the phone app (vibration and verbal announcement) and the bus sign.
- Participants were able to repeat either of the test cases.
- TTI researchers walked the participants back to the parking area and asked questions about their experience of the app. Appendix C provides the questions used in the interviews.

Overall, feedback on the app was positive. Participants had similar comments about the aspects they found most and least helpful. All of the B/LV participants and two of the three typical-vision participants said that this type of app would provide useful

information and make them feel safer at intersections. The following comments were made by B/LV participants:

- My phone is my main navigational aid when I walk. The less I have to rely on my own senses to detect hazards, the more I can focus on my main task, which is getting where I need to go.
- The app is helpful as an additional tool for navigating my way while on foot. Not all people recognize what the white cane means, so drivers may not know that I cannot see them approach.
- In general, there is excitement over new apps that can help the B/LV community—there are other apps like Oko and smart glasses that use AI that can help differentiate intersections and crossings. As the app stands now, it would be less helpful for me because it does not indicate when it is safe to cross and when the bus is gone.

Comments from typical-vision participants included the following:

- I walk a lot, and intersections can be scary for pedestrians. Having this additional warning would improve my safety when I am crossing the road.
- I am a bicyclist, and I would like to have something like this app.
- I do not think this type of warning would be as necessary for me.

Participants generally found the verbal warning from the phone app difficult to hear over the ambient traffic noise and especially when the audible warning at the intersection itself was activated. The three B/LV participants had the following comments about the audible warning:

- Any verbal or audible warnings from an app like this should be coordinated to ensure that they do not interfere with the verbal instructions provided by navigation apps (similar to how music or other apps pause or fade out so that a driver can hear verbal instructions from a GPS navigation app).
- Rather than the verbal warning, a loud distinctive sound (an example is the alarm that comes from your phone during an Amber Alert or similar emergency alert) would be easier to hear in a noisy environment like a traffic intersection.
- The audible warning from both the phone and intersection was easier to comprehend. The warning only from the phone was harder to hear with the traffic noises, so having the audible alert on the phone and the intersection pole was helpful.

All the B/LV and typical-vision participants liked the haptic/vibration warning. Participants provided the following comments on this feature:

- The vibration felt very familiar, very much like what I would expect to get from Google Maps or Waze to let me know a new message or direction is coming.
- The vibration is the best alert for me and minimizes confusion.
- It would be helpful to have adjustable levels of vibration for people who carry their phone in a pocket or backpack while they are walking.

Participants provided the following additional suggestions about the app format and additional integration:

- An Apple Watch version of this app would be helpful.
- Could this warning be integrated into an existing navigation app for pedestrians so that you do not have to have two apps running at once and have to try to pay attention to both of them?
- To reach as many people as possible with an app like this, you could make it available for free download and subscription, like the Maroon Alerts.
- On campus, it would be good to integrate these warnings with the Texas A&M University transit and map apps.
- Any app, to be truly compliant, would need to consider the deaf and blind community as well.
- It would be beneficial for the app to tell me when it is safe to start crossing the intersection.
- Providing information on how much time is available to cross the intersection, like the countdown available on the pedestrian sign, would be beneficial.
- Identifying when the bus has cleared the intersection, in addition to how much time is left to cross, is important. If you indicate that a bus is turning, the B/LV pedestrian would then need a message to indicate when it is safe to cross, or they will not cross.
- Providing information on other hazards at the intersection would be beneficial.