



Connected Vehicles Deployment Benefits

Connected Vehicle deployments can have both short-term and long-term benefits to our transportation systems and to the public. These benefits are largely touted as being for safety, mobility, and the environment. We are generally familiar with the NHTSA statement that connected vehicle technology “could eliminate or mitigate the severity of up to 80 percent of non-impaired crashes.” A 2014 NHTSA study concluded that with just two V2V applications—Left Turn Assist and Intersection Movement Assist—between 121,000 and 174,000 crashes could be prevented after 10 years of implementation. But, how do we bring those benefits closer to home and into the near-term? Some examples might be helpful.

The Utah DOT deployed a Dedicated Short Range Communications-based transit signal priority system along one 11-mile, urban corridor in 2017. Initial studies indicated that equipped buses on this corridor had an improvement in schedule reliability by about 6 percent. A second study that focused on the criteria for triggering priority requests concluded that on-time performance of these buses is improved up to 2.5 percent, schedule deviation is improved by up to 20 seconds, and travel times are improved at 72 percent of the timepoints along the route. A second corridor was equipped in 2018—a bus rapid transit corridor—and similar results were found for these buses. Small-scale deployments can yield immediate results, and these benefits can be expanded with further deployments.

The Utah Department of Transportation (UDOT) is currently deploying another connected vehicle system, with a focus on a Spot Weather Impact Warning (SWIW) application. The concept behind this application is that vehicles will sense adverse road-weather conditions— like ice and packed snow on the pavement—and report those conditions to the connected vehicle system. The system will then warn subsequent vehicles of this hazardous condition in advance of them encountering it, allowing the driver to slow down or take other evasive action. In addition, this information will allow Transportation Operations Center operators to post general warnings and dispatch maintenance crews to mitigate the hazard.

An internal 2018 study indicated that a SWIW system installed along 159 miles of weather-crash-prone Utah roads would yield a 20-year savings of \$97.7 million, assuming that all vehicles are eventually equipped. The system is projected to prevent 1,654 crashes, including five deaths and 47 serious injuries. While these benefits are not immediate, UDOT believes that implementation needs to begin now to reap the ultimate benefit; especially considering that some major automakers have announced connected vehicle equipment will be on new vehicles starting in 2022. UDOT has installed roadside units on Interstate 80 east of Salt Lake City and on several state roads near the Park City area as part of this development.

Connected vehicle benefits can be realized on a small scale in the short term, but we also must focus on beginning to create the infrastructure needed for larger, longer-term benefits.

How ITE Can Help

The ITE CAV Standing Committee within the Transportation Systems Management & Operations Council has been actively and periodically circulating key updates on activities in the CAV world. The committee represents ITE on key issues that will determine the future of emerging technologies in saving lives and improving mobility. Activities include responding to proposed changes in 5.9 gigahertz (GHz) spectrum allocation by the Federal Communication Commission, reviewing United States Department of Transportation guidelines and publications, circulating the key information among the members at large, and collaboration with other organizations on CAV issues.