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Assessment of the Infrastructure Readiness for Connected Vehicle to Infrastructure Applications on Arterial Streets

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Current Situation

Connected vehicles (CV) are the future.

To be safe, modern CVs must communicate with the infrastructure around them. Therefore, the Florida Department of Transportation (FDOT) needs to establish requirements for CV applications used in conjunction with roadside equipment (RSE) like signal controllers. Setting requirements for CV applications could improve communication between RSEs and CVs, ultimately leading to more dependable information being communicated to drivers through their CV's onboard unit (OBU).

The requirements should ensure that messages from RSEs to CVs are received, properly encoded, complete, and correct.



This connected vehicle-to-infrastructure applications environment setup tested wireless and wired connections for several CV applications.

Research Objectives

This project developed requirements for CV applications and a testing plan for these applications. The requirements focused on setting message level parameters, which are needed to ensure the messages generated by the CV's on-board unit are synced with the RSE.

Project Activities

Following a review of the state of practice for using and testing CV applications and a review of the current applications, researchers at the Florida International University (FIU) developed message-level requirements for three CV applications that signal the driver to drive cautiously: Red Light Violation Warning, Emergency Vehicle Preemption (EVP), and a combined Work Zone Warning (WZW) and Reduced Zone Warning and Lane Closure (RSZW/LC).

The research team then developed test plans to verify that the messaging produced by the RSE was complete, correct, and properly received by the CV's OBU.

Last, the team tested the applications to verify continuity in messaging using different data capturing methods, e.g., wired connection using an ethernet cable and wireless connection.

Project Conclusions and Benefits

All three applications passed the requirements and demonstrated successful communication between CV applications and RSEs. This study showed that by improving the compatibility between these systems, CV messaging can be more dependable for Florida travelers and ultimately reduce the risk of crashes.

For more information, please see fdot.gov/research.