



# UNIVERSITY TRANSPORTATION CENTER RESEARCH BRIEF

**PROJECT TITLE:** Field Evaluation of V2I Connected Vehicle Deployment in Ada County, Idaho - Validating Communication Architecture and Control Technology Readiness

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**INSTITUTION:** UNIVERSITY OF IDAHO

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## Background

Connected vehicle technologies aim to tackle some of the safety, mobility, and environment challenges our surface transportation system faces and have the potential to transform the way we travel through improved mobility and safety. However, the field implementation of connected vehicle technologies might face several barriers. They require an extensive communication network to support V2I data exchange and the installation of several field devices. Additionally, the legacy traffic control devices, currently running our traffic signal system throughout the nation need to be upgraded to allow for their integration with different connected vehicle applications. The primary objective of the project is to conduct a field evaluation of a V2I connected vehicle deployment in Ada County, Idaho focusing on validating the communication architecture and control technology readiness for such implementations. This objective help accelerate the deployment of V2I technologies at intersections throughout the northwest and the nation. The primary focus of the project will be on validating the SDRC data exchange between vehicles, roadside units, and traffic controllers. The project will demonstrate the potential benefits of V2I technology at signalized intersections and identify potential technological and institutional obstacles that might face the deployment of such systems.



## Research Project

Ada County Highway District (ACHD), the primary agency responsible for operating the Greater Boise Area traffic network is planning to implement vehicle to infrastructure (V2I) technology at 20 intersections as part of the FHWA's SPAT challenge. This V2I interface has two elements of connected-vehicle V2I traffic signal system applications: 1) priority for heavy vehicles at signalized intersection approaches and 2) traffic signal system V2I and I2V data exchange. For the heavy vehicle priority application, some selected heavy vehicles, will be equipped with on-board DSRC units, cable of communicating with Road Side Units (RSUs) that are connected to the traffic signal controller at the intersection. Traffic controllers on a segment of the road will have the capability to send timing info (SPAT) and MAP messages to vehicles. The proposed implementation will involve the installation of Dedicated Short Range Communications (DSRC) radios and an interface device in some test vehicles. The project activities will include a review of control technology and communication resources and other resources needed to facilitate the connected vehicle V2I implementation, a hardware-in-the-loop pre-deployment testing and validation at the UI NIATT's traffic controller lab, and field evaluation of the two connected-vehicle V2I application in Boise, Idaho.