

Rural Connected Vehicles in Eastern Idaho

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BACKGROUND

The US Department of Energy operates a large research facility (about 1000 sq miles) in rural eastern Idaho ("Idaho National Laboratory") that employs a staff of approximately 6,500-7,000 engaged in research of nuclear power generation and other scientific fields. The employees work for 4 prime contractors at the INL. Most of the employees live along the I-15/US-20 corridor between Pocatello, ID and Rexburg, ID and commute daily 60 to 70 miles one way to/from the remote INL facility. The primary INL site contractor provides transit service (103 buses) for three of the four primary contractor employees, which originate from Pocatello, Blackfoot, Idaho Falls, Rigby, Rexburg, and Mackay. There are also van pools and private vehicles that transport employees to and from the facility. Over the years there have been issues with traveling during winter conditions and incidents attributed to slick roads, limited visibility, and animal-vehicle collisions. The rural commuter routes currently have limited ITS deployments (RWIS, DMS) using 3G commercial cellular service. The INL is required to comply with Executive Order 13514 relative to reducing fossil fuel consumption and Green House Gas emissions.

The Idaho Transportation Department (ITD) is charged with maintaining the statewide highway system including the commuter routes used daily by INL. The challenges for road maintenance include significant winter storm events, reduced visibility from blowing snow and blowing dust, and difficult weather forecasting in this region. Road closures, when they become necessary for safety, are initiated and terminated by ITD.

The Idaho State Police (ISP) is charged with law enforcement and incident response statewide, including on the INL commuter routes. Road closures are coordinated with ITD.

The Idaho Health and Welfare EMS Bureau is charged with operating the ITS network and the 511 data input statewide.

All four agencies are very interested in having the tools available to significantly improve their mission performances.

THE PROJECT

A Concept of Operations was developed and is being finalized at this time. The Elements of the project are:

- The Connected Vehicle fleets will consist of the INL transit buses, the INL van pool, ISP patrol cars, ITD snow plows, private vehicles, and ITD maintenance vehicles.
- All vehicles will be outfitted with GPS receivers, DSRC/cellular communications, road conditions sensors, webcams, and mobile data terminals.
- Some vehicles will have additional on-board equipment installed, including vehicle monitoring telemetry and pavement monitoring sensors.
- Approximately 50 DSRC roadside units will be installed.
- Backhaul communications will consist of fiber optics and cellular to the server center.
- A server center will be developed in Idaho Falls to host the server group.
- The server center will be networked with the ITD district offices, ITD HQ, and the State Communications Center (EMS + ISP).

- The applications that will be developed include:
 - Expanded real-time traveler information dissemination;
 - Enhanced weather alerts and road conditions reporting;
 - Additional road weather forecasting and monitoring;
 - Incident detection and mayday relays;
 - Fleet management and emissions monitoring/reporting;
 - Pavement condition data collection and reporting;
 - Vehicle-to-vehicle and roadside-to-vehicle safety alerts;
 - Improved transit dispatch and detour routing;
 - Curve speed warnings;
 - Animal incursion alerts and avoidance warnings; and
 - Broadcast of video snapshots from in-vehicle dashboard cameras.