UTC Project Information	
Project Title	MPC 431- Connected Vehicle Weather Data for Operation of Rural Variable Speed Limit Corridors
University	University of Wyoming
Principal Investigator	Rhonda Young
PI Contact Information	Department of Civil and Architectural Engineering 1000 E University Ave Laramie, WY 82071 rkyoung@uwyo.edu (307) 766-2184
Funding Agencies	USDOT, Research and Innovative Technology Administration
Agency ID or Contract Number	DTRT12-G-UTC08, Modification No. 1
Project Cost	$204,507
Start and End Dates	January 1, 2013- December 31, 2013
Project Duration	1 Year
Brief Description of Research Project	The term Connected Vehicle refers to the federal initiative to develop and deploy a fully connected transportation system where data is shared between different vehicles and between vehicles and the transportation infrastructure which shows promise for addressing mobility and safety issues (RITA, 2012). With respect to impacts to the transportation system due to weather events there is an area of Connected Vehicle applications specific to road weather where weather data can be collected from existing on-board vehicle systems to support the operations of the roadway segments during weather events (FHWA, 2011a). Vehicle data could then be shared among other travelers or to the roadway agency operating the road. Weather data that can be collected from on-board vehicle systems include the barometric pressure, windshield wiper settings, air temperature, ABS Brake Status, traction and stability control, and differential wheel speeds (Drobot, 2009). The hope is that eventually vehicle manufacturers will begin integrating technology into their cars at the factory that will allow transmission to roadside data receivers but until this happens the vehicle system data must be read through a Can-bus reader. This raw data can then be processed into weather data useful for roadway operations through the use of a Vehicle Data Translator or VDT (Drobot et al, 2011). Variable speed limits (VSL) are an intelligent

	transportation system (ITS) application where regulatory speed limits are posted based on real-time conditions in an effort to improve roadway capacity and/or safety. Rural applications of VSL are primarily focused on improving safety and are typically weather based to address safety concerns due to hazardous weather conditions. The Wyoming Department of Transportation began implementing VSL systems to address weather safety concerns in February of 2009 and currently have five VSL corridors in the state (Buddemeyer et al., 2010). Four of these corridors are located along Interstate 80 that runs along the southern edge of the state and the latest VSL implemented in October of 2012 is located on a two-lane rural highway that runs across the Wind River Range called South Pass. VSL corridors operate by reacting to real time conditions to post regulatory speed limits so they rely heavily on real time data. A VSL control strategy can be implemented to collect and analyze data to develop suggested speed limits to be implemented by the roadway operator. For weather based control strategies, the weather data is typically collected from roadway weather information systems (RWIS). RWIS are a common technology deployed by DOTs to collect weather and pavement condition data and are located in close proximity to roadway segments. Currently the FHWA Clarus Initiative shows 2,253 RWIS stations in the U.S. and western Canada (FHWA, 2011b). While the deployment of RWIS stations has seen a large increase in recent years they are still snapshots of weather conditions. When the first WYDOT VSL system was implemented in February of 2012 the 35 mile corridor between the towns of Rawlins and Laramie had a single RWIS station. Since that time the 12 additional RWIS stations were installed when the corridor was lengthened to 52 miles in order provide better coverage of the roadway but that still leaves on average 5 miles between weather stations. Research into the development of a control strategy for the WYDOT VSL corridors is ongoing but a weather and speed based strategy is currently being tested on the Elk Mountain corridor. Through this research, extensive monitoring of weather variables for three and half winters has been performed. The proposed research would look at the applicability of integrating Connected Vehicle weather data from the Vehicle Data Translator into this control strategy for the Elk Mountain VSL corridor to see if the VSL operations could be improved. The hope is that the continuous data from the VDT would supplement the RWIS data along the corridor to provide a more complete picture of road conditions. The more accurate and reliable the VSL control strategy can become the higher the likelihood of good

	speed compliance would be. Better speed compliance and lower speed deviations are surrogate measures for improved safety of the corridor. **Research Objectives:** The objective of this research work is to investigate the applicability integrating Connected Vehicle weather data into the existing weather-based control strategy for a rural VSL corridor in an effort to improve the control strategy and increase safety along the corridor.
Describe Implementation of Research Outcomes (or why not implemented) Place Any Photos Here	
Impacts/Benefits of Implementation (actual, not anticipated)	

Web Links • Reports • Project Website	