UTC Project Information	
Project Title	MPC-698 – Connected Vehicle Winter Safety Improvement with Infrared Thermography Technology
University	University of Utah
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Funding Source(s) and Amounts Provided (by each agency or organization)	USDOT, Office of the Assistant Secretary for Research and Technology $40,000 Utah Department of Transportation $50,000
Total Project Cost	$90,000
Agency ID or Contract Number	69A3551747108
Start and End Dates	October 13, 2022 to July 31, 2024
Brief Description of Research Project	Safety is the principal concern of highway transportation. Slippery roads can pose high risks of traffic collisions in snowy regions, which cover about 70 percent of road networks and population in the U.S. Icy/snowy roads can significantly reduce tire frictions, lengthen vehicle braking distance, and thereby induce high risks of car crashing. Hence, if early warning could be provided to drivers before they enter hazardous locations, potential crash risks could be significantly reduced. Conventionally, state DOTs use warning signage to alert drivers of hazardous road segments. However, slippery spots are usually hard to predict, and their locations could be changing overtime. Placing warning devices would then have limitations in addressing such dynamic situations. Recent advancements of connected vehicle or CV technology offers a new and effective solution to tackle this issue. For example, in the work with Panasonic, UDOT has already developed a Spot Weather Impact Warning application, which uses data from RWIS stations and CV information to determine the existence of potentially slippery road surfaces and then send a message to oncoming CVs. The current Spot Weather Impact Warning application relies on ITS roadway equipment (RWIS) and partially on information from Connected Vehicles to detect the road surface temperature, moisture, icing, and other metrics to detect road slippery conditions, where the adopted sensors typically provide single-spot measurements. This project could fill the gap in augmenting or complementing the road slippery detection algorithm.

Describe Implementation of Research Outcomes (or why not implemented) Place Any Photos Here	The system has been installed by the I-80 and Park City RWIS locations and monitored the roadway slippery conditions over the past two winter seasons.
Impacts/Benefits of Implementation (actual, not anticipated)	The developed technology can potentially conduct multi-lane roadway ice/snow coverage estimation, which is superior to the state-of-the-art single-spot measurements.
Web Links • Reports • Project Website	• MPC Final Report – Winter Safety Improvement with Computer Vision and Transfer Learning