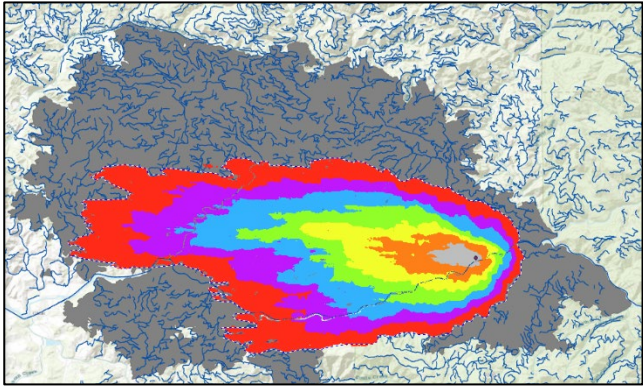| UTC Project Information	
Project Title	Mitigating wildfire impacts on mobility using GIS, fire simulation, and operations modeling.
University	Oregon State University
Principal Investigator	Joseph Louis
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Funding Source(s) and Amounts Provided (by each agency or organization)	University of Washington PacTrans $40,000 Oregon State University $ 40,000
Total Project Cost	$80,000
Agency ID or Contract Number	69A3551747110
Start and End Dates	March 16, 2021-October 15, 2022
Brief Description of Research Project	This research project completed the following tasks to enhance our understanding of the impact of wildfires on Oregon's transportation network: Task 1: Wildfire simulations to identify areas of damage: A dynamic fire simulation tool called FlamMap was used to create realistic simulations of wildfire spread through Oregon's forest under changing environmental conditions. Task 2: Debris spread and other damage estimation: The wildfire simulation combined with current vegetative cover in the forest were used to estimate the amount of debris created as well as the damage to transportation infrastructure. Task 3: Quantification of road clearance/travel times based on equipment availability: A network analysis framework was used to determine travel times to the impacted areas based on damage to roadways.

Describe Implementation of Research Outcomes (or why not implemented)	The research outcomes were implemented in the following manner: 1. <u>Wildfire simulation:</u> The wildfire simulation was conducted using the FlamMap software, which simulates the spread of wildfires by considering a variety of variables such as local topography, fuel availability, wind direction. It provides outputs in terms of the areas affected by the fire as it spreads. While not all of the variables were accurately used in the simulation, the results did generally track the real-world fire based on a GIS-based comparison using available data. 2. <u>Roadway impact:</u> Once the fire simulation was completed, the results obtained were overlaid upon the road network map in the affected area to identify which road segments were within the fire-affected areas. This process provided information relating to the length and location of damaged roadways, along with estimates of debris amount for clearance and hazard tree counts to be harvested. This was performed using ArcGIS. 3. <u>Quantification of road clearance/travel times:</u> Travel times for access to impacted areas were obtained by determining the shortest routes around fire-impacted regions. This was performed using the Network analyst tool in ArcGIS.
Place Any Photos Here	 *Figure 1 Overlay of simulated 2020 Archie Creek Fire on road network in Eastern Oregon*
Impacts/Benefits of Implementation (actual, or anticipated)	1. The results from the wildfire indicate that results from fire simulation can provide valuable information to decision-makers about fire-impacts, which can be utilized for emergency planning. 2. Results regarding the damages sustained by roadways and debris amounts can be used by transportation agencies to plan recovery operations after wildfires. 3. The shortest route selection using the Network Analyst tool can aid in guiding evacuees and first responders after fires in a safe and efficient manner.

Web Links	NA
• Reports • Project Website	