

<b>UTC Project Information</b>	
Project Title	Development of a Connected Smart Vest for Improved Roadside Work Zone Safety
University	Virginia Tech
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Funding Source(s) and Amounts Provided (by each agency or organization)	Safe-D (Federal): \$292,302 VTI match: \$279,642 TTI match: \$20,000
Total Project Cost	\$591,945
Agency ID or Contract Number	Grant No: 69A3551747115 Project: 04-104
Start and End Dates	3/10/19 – 5/31/20
Brief Description of Research Project	<p>Roadside work zones (WZs) present imminent safety hazards for roadway workers as well as passing motorists. In 2016, 764 fatalities occurred in work zones in the United States due to motor vehicle traffic crashes. A number of factors (aging highway infrastructure, increased road work, increased levels of traffic and more nighttime WZs) have led to an increase in WZ crashes in the past few years. Consequently, WZs are becoming increasingly dangerous for workers as well as passing motorists. The standard work zone safety signage and personal protective equipment (PPE) worn by workers at roadside WZs have not been completely effective in controlling work zone crashes. A viable solution to this problem is to design a wearable device to accurately localize, monitor, and predict potential collisions between WZ actors based on their movements and activities, and communicate potential collisions to workers, passing drivers, and connected and automated vehicles (CAVs). This project aims to develop a wearable worker localization and communication device (i.e., Smart Vest) that utilizes the previously developed Threat Detection Algorithm (Safe-D project 03-050) to communicate workers' locations to passing CAVs and proactively warn workers and passing motorists of potential collisions. As a result, this research is expected to significantly improve the safety conditions of roadside WZs through prompt detection and communication of hazardous situations to workers and drivers.</p>

<p>Describe Implementation of Research Outcomes (or why not implemented)</p> <p>Place Any Photos Here</p>	<ul style="list-style-type: none"> <li>• Final Report</li> <li>• Final data delivery</li> <li>• EWD plan <ul style="list-style-type: none"> <li>○ Conference article/presentation</li> <li>○ Demonstrations/training for industry partners</li> </ul> </li> <li>• T2 plan <ul style="list-style-type: none"> <li>○ Design clinics and/or user surveys</li> <li>○ On-road demo</li> <li>○ Journal article</li> </ul> </li> </ul>
<p>Impacts/Benefits of Implementation (actual, not anticipated)</p>	<p>The overarching goal of this research is to design and develop a smart wearable device that increases roadway workers' situational awareness and to inform workers and CAVs about detected hazardous situations to avoid imminent safety hazards. To this end, this research will utilize current and emerging transformative technologies that will work in conjunction with CAVs to minimize the increasing safety risks associated with roadside WZs. Equipping roadway workers with the technology to ultimately communicate with approaching CAVs can help eliminate imminent safety hazards associated with passing CAVs before they occur and reduce the occurrence of accidents by alerting workers about unsafe exposures.</p>
<p>Web Links</p> <ul style="list-style-type: none"> <li>• Reports</li> <li>• Project website</li> </ul>	<p><a href="https://www.vtti.vt.edu/utc/safe-d/index.php/projects/development-of-a-connected-smart-vest-for-improved-roadside-work-zone-safety/">https://www.vtti.vt.edu/utc/safe-d/index.php/projects/development-of-a-connected-smart-vest-for-improved-roadside-work-zone-safety/</a></p>