

Date of Last Update (edit each time): **11/08/2012**

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| <b>UTC Project Information</b>  |   |
| Project Title   | Private 5G Technology and Implementation Testing  |
| University  | Virginia Tech   |
| Principal Investigator  | Jean Paul Talledo Vilela  |
| PI Contact Information  | <a href="mailto:jtalledovilela@vtti.vt.edu">jtalledovilela@vtti.vt.edu</a>  |
| Funding Source(s) and Amounts Provided (by each agency or organization) | Safe-D (Federal): \$55.950<br>Matching Fund (Non-Federal):<br>NEC: \$113.285  |
| Total Project Cost  | \$169.235   |
| Agency ID or Contract Number  | Project: VTTI-06-006  |
| Start and End Dates   | 11/01/2021 – 10/31/2022   |
| Brief Description of Research Project                                   | <p>The automotive sector is considered to be one of the most prominent verticals that will benefit from the capabilities of the upcoming 5G cellular networks. Vehicular applications cover a wide range of use cases and thus a large set of associated requirements. Examples include very high data rates and timely service delivery, while also considering ultra-low communication latencies, just to mention a few. Complex scenarios where vehicles communicate among themselves and also with nearby road infrastructure, road users, clouds, etc. also known as vehicle-to-everything (V2X) communications will not only leverage the 5G network but will play a key role in its design.</p> <p>VTTI and Sponsor will deploy a Private 5G network supporting video analytics using camera sensors that will be installed at the VTTI Smart Road intersection. This implementation includes the road infrastructure and the backend required 5G hardware.</p> <p>The project will analyze the technical and non-technical issues brought by the Private 5G and the interface with V2X systems including RSUs and OBUs.</p> |

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| <p>Describe Implementation of Research Outcomes (or why not implemented)</p> <p>Place Any Photos Here</p> | <p>VTTI will design and execute five use case scenarios using private 5G and C-V2X communications:</p> <ul style="list-style-type: none"> <li>• Vehicle to pedestrian collision prediction</li> <li>• Street parking vehicle</li> <li>• Traffic accident detection</li> <li>• Pedestrian detection at a crosswalk</li> <li>• Vehicle turning (left/right) alert</li> <li>• Overspeed detection</li> </ul> |
| <p>Impacts/Benefits of Implementation (actual, not anticipated)</p>                                       | <ul style="list-style-type: none"> <li>• Low latency smart sensor data processing using EDGE computing</li> <li>• Secured communications between vehicle, pedestrian and infrastructure using C-V2X technology</li> <li>• Safety alerting pedestrians and vehicles around intersection using C-V2X and 5G Technologies</li> </ul>   |
| <p>Web Links</p> <ul style="list-style-type: none"> <li>• Reports</li> <li>- Project website</li> </ul>   | <p><a href="https://safed.vtti.vt.edu/projects/private-5g-technology-and-implementation-testing-i/">https://safed.vtti.vt.edu/projects/private-5g-technology-and-implementation-testing-i/</a></p>  |