

| UTC Project Information | |
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| Project Title | MPC-547 – Infrastructure Safety Support System for Smart Cities with Autonomous Vehicles |
| University | North Dakota State University |
| Principal Investigator | Ying Huang Pan Lu Raj Bridgelall |
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| Funding Source(s) and Amounts Provided (by each agency or organization) | <p>USDOT, Research and Innovative Technology Administration \$282,450</p> <p>North Dakota State University \$282,450</p> |
| Total Project Cost | \$564,900 |
| Agency ID or Contract Number | 69A3551747108 |
| Start and End Dates | November 20, 2017 to July 31, 2022 |
| Brief Description of Research Project | <p>Driverless vehicles must be self-aware to make learned and ethical decisions to avoid crashes in multimodal and diverse settings. This proposed effort will develop an Infrastructure Safety Support System by embedding V2I enabled sensor networks into the transportation infrastructure to provide autonomous vehicles and human drivers with inputs to improve their decision making when obvious decisions may not be possible. In addition to the four research objectives of this project, the team will use the results from this development to enhance curricula that would engage and mentor students in the practice of developing safe smart cities. This project will involve</p> |

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| | <p>three graduate students and several undergraduate students. The trainings through this project will prepare students for potential careers in smart city developments.</p> |
| <p>Describe Implementation of Research Outcomes (or why not implemented)</p> <p>Place Any Photos Here</p> | <p>In this research, the infrastructure safety supporting system was designed, built, and validated. The car-following model for the autonomous vehicles considering the implementation of the system was developed and calibrated using microsimulation tools. Due to the lack of autonomous vehicle at NDSU, field testing used traditional vehicles with smart phones to assess the developed system. In the future, if allowed, research collaborators can be found to further test the system in an autonomous vehicle testing sites.</p> |
| <p>Impacts/Benefits of Implementation (actual, not anticipated)</p> | <p>This research will potentially contribute toward the existing knowledge of vehicle and highway automation where it uses the intelligent transportation system (ITS) application and implements it in a simulation platform. Effective communication between vehicles using the sensors embedded in the road infrastructure will ensure the safety of drivers by reducing the number of conflicts and crashes, improve travel times for different routes, and provide a tool for managing traffic congestion and traffic flows.</p> |
| <p>Web Links</p> <ul style="list-style-type: none"> • Reports • Project Website | <ul style="list-style-type: none"> • MPC Research Report |