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16 . ABSTRACT

The number of collisions at urban and rural intersections has been on the rise in spite of technological innovations and advancements for vehicle safety. It has been reported that nearly a third of all reported crashes occur in such areas. Consequently, there is a need for a reliable-real time warning system that can alert drivers of a potential collision. Most collision avoidance systems currently being researched are based on road-vehicle or inter-vehicle communication. Such systems are vehicle dependent, thus limiting its applicability to vehicles that are equipped with the proper technologies.

In this project, an intersection collision warning (ICW) system based solely on infrastructure communication was developed and tested. ICW utilizes wireless sensor networks (WSN) for detecting and transferring warning information to drivers to prevent accidents. The system is deployed into intersection roadways and supports real time prevention by monitoring approaching traffic and providing a warning system to motorists when there is a high probability of collision.

The ICW system has been tested at the University of Oklahoma Tulsa campus. For the purpose of evaluation, different collision scenarios have been emulated in a lab setup while the system performance and detection accuracy are evaluated. Results confirm the ability of the system to provide a warning signal in high probability collision situations.

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