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| **Roadside Safety Pooled Fund Program****Problem Statement/Research Proposal** | State:Texas 2015 – **TX-88** |
| Title:ITS Technology Application for Approaching Vehicle Notification |
| Problem Statement: Crashes caused by wrong way drivers do not occur often, but when they do, they typically result in deaths or serious injuries. In a study that examined 60 wrong way crashes in Ohio, between January 2011 and April 2013, 31 people died and 85 suffered injuries. Fifty eight percent of the wrong way drivers were suspected of being impaired. Wrong-way drivers typically fall into two groups, “confused elderly drivers, and alcohol or drug impaired drivers.” The study also reported drunken drivers caused 100 percent of the wrong way crashes that occurred during the summer and 57 percent of those that occurred during the winter. Also, more than four out of five wrong-way crashes occurred during nighttime hours. Data has shown that wrong way driving crashes are a problem for states. Finding a solution to decrease the number of wrong way driving crashes will lead to a decrease in fatalities, injuries, and ultimately decrease the cost to public agencies. According to the Highway Safety Manual 2009, the amount of a fatality injury severity level crash is $4,008,900, for a disabling injury severity level crash $216,000, for an evident injury severity level crash $79,000, for a possible injury of $44,900, and for a crash with property damage only $7,400. Based on the average fatal wrong way collisions reported by NTSB, the cost of wrong way driving crashes is approximately $1,042,314,000 every year.Despite over forty years of highway design, marking, and signing improvements at freeway interchanges, the problem of wrong-way driving continues. The majority of previous studies have been focused in signage, surveying, pavement markings, and making improvements and modifications to the design of interchanges. Alerting a wrong way driver might not be an efficient mean when the driver is impaired. Also, alerting police officers or external operators is certainly good practice, might the arrival of the police officers at the scene will take time, and during that time the wrong way driver might have easily already drove a few miles along the highway, in the wrong direction, increasing the chance for causing accidents.It is not uncommon for accidents to occur between emergency vehicles (ambulances, firefighters trucks, police cars, etc…) and other vehicles, especially at intersections. Emergency vehicles are preferred to be given the right of way when they are in an emergency call, but recognition of an upcoming emergency vehicle might not be simple in some situations. Especially on busy roads and at traffic lights, it is not rare to see emergency vehicles trying to overpass other vehicles and cross intersections even when they have a “red’ light. The opposing traffic might not be in the ideal situation to clearly see and/or hear the emergency vehicle coming (this can be due to limited visibility, driver not able to hear the sirens until the last moment, distraction of the driver, etc…). On a similar note, the law requires motorists to yield the right-of-way to school buses. If a motorist approaches a school bus from either direction and the bus is displaying alternately flashing red lights, the motorist is required to stop and not to pass the bus until the school bus has resumed motion, the school bus has signalized the driver to proceed, or the red lights are no longer flashing. Intelligent Transportation System (ITS) technology can be used as a quick and efficient notification method for the presence of approaching vehicles, such as vehicles proceeding in the wrong way direction and vehicles approaching with the right-of-way.  |
| Objectives of the Study: The objectives of this project are:PHASE I:1. Investigate technology and means to alert drivers of upcoming wrong way drivers and vehicles with right-of-way;
2. Develop a guidance on the best way to communicate to the drivers of the upcoming vehicle (use of signs? If so, which one, where to place it?; messages transmitted to the vehicle: through dashboard, what type of messages?)

PHASE II:1. Repurpose of existing ITS technology to alert drivers of the upcoming vehicle. Capability of the technology to identify the upcoming vehicle will be verified as well as its ability to send messages to properly position signs installed on relevant location. These signs need to be able to timingly and properly display alerting messages to the other drivers, to make them aware of the possible presence of the upcoming vehicle.
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| Expected Benefits:The results of this study will provide with an initial understanding of the feasibility and effectiveness of use of V2V and I2V technology with respect to communication to other motorists of upcoming presence of vehicles (in wrong way direction or with right-of-way).   |
| Description of the Proposed Feature to be Tested: *(Be as detailed as possible. Include drawings and/or plans, if available.)* |
| Estimated Cost *(of the feature per linear foot installed):*$xx,000 | Total Estimated Cost of Crash Test:$xx,000 |
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