DEVELEPMENT AND EVALUATION OF AN ADVANCED LED WARNING SYSTEM FOR RURAL INTERSECTIONS: Phase-2 (ALERT-2)

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The ALERT system was developed to address the safety issues related to sight restrictions in rural through/stop intersections. The system consists of vehicle detectors that detect approaching or stopped vehicles, LED blinker signs, battery packs integrated with solar-panels, and wireless transceivers with microcontrollers.

In the first phase of the project, we found that the ALERT-1 system was effective at reducing vehicle speeds on the main approach, increasing the wait time, and altogether stopping roll-throughs for vehicles on the minor approaches when a conflict exists at the intersection. However, an increase in roll-throughs when no conflict exists at the intersection was observed. This problem is addressed in the ALERT-2 system by converting the two static STOP signs in the minor approaches to blinker STOP signs and then by adding vehicle detectors equipped with a remote actuator at the paired Stop Ahead sign. With this modification, a vehicle approaching the intersection from the minor approaches first sees a blinker STOP sign activated, as the vehicle passes through the Stop Ahead sign. The activated blinking is turned off as the vehicle arrives to the entrance of the intersection. At that moment, the motorist next sees advanced warning information through the VEHICLE APPROACHING blinker sign which is located on the other side of the intersection and activated by another vehicle that approaches from the major lane (through traffic). This sign activation sequence is designed for the motorists to feel as if the STOP sign and approaching vehicle information is personalized to them by dynamically responding to the crossing traffic. This new design (ALERT-2) is expected to reduce the roll-throughs while keeping the positive effects of the ALERT-1 system. The ALERT-2 system is fully implemented and operational, and in the process of data collection and evaluation.