Smart Work Zone System

Introduction

Each year, approximately 124 roadside workers are killed due to the hazardous nature of their work. Workers are typically exposed to traffic that is not being slowed down or rerouted during work zone setup and dismantling, making this phase of the job especially dangerous. On top of this, roadside workers are at risk while operating in the work zone if inattentive or impaired drivers are nearby.

System Description

To combat these issues, VTTI is pushing the envelope for safer roadside conditions by creating the Smart Work Zone system, a dynamic and wireless system that provides alerts to work zone workers and passing motorists including connected and automated vehicles (CAVs) when a potential collision is imminent or when the wearer is about to cross a safe area geofence boundary. The system uses three components

- The SMART Vest devices connect workers to the virtual work zone. Workers wearing SMART Vests transmit GPS data to the Base Station and receive warnings when hazards are imminent or when workers approach or cross geofence boundaries. These warnings allow workers to be aware of potential risks ahead of time and to plan accordingly.
- The SMART Cones are traffic cones mounted with geo-plotting hardware and determine the size and geometry of the virtual work zone by transmitting GPS data to the Base Station. This technology creates a dynamic network, allowing workers to update work zone boundaries in real-time by simply moving the position of the cones.
- The C-V2X Base Station generates the work zone geofence and serves as the primary processing unit of all wireless communications. The Base Station shortens the work zone setup and tear-down time by consolidating the processing hardware into one unit

VTTI's smart work zone system brings together the capabilities of a smart vest for workers, a smart cone system, a base station, and the Work Zone Builder work zone design application to make the most accurate and timely data available to provide safety feedback to roadside workers while informing passing motorists aware of work zone hazards in real time.

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