Photo Source: USDOT

CONNECTED VEHICLE APPLICATIONS:
SAFETY

LIMIT 35

Connected vehicle safety applications are designed to increase situational awareness and reduce or eliminate crashes through vehicle-to-infrastructure (V2I), vehicle-to-vehicle (V2V), and vehicle-to-pedestrian (V2P) data transmissions. Applications support advisories, warnings, and vehicle and/or infrastructure controls.

This resource includes a brief description for each connected vehicle safety application. In addition, the Connected Vehicle Reference Implementation Architecture website (http://www.iteris.com/cvria/html/applications/applications.html) provides more information about each application.

Photo Source: USDOT

V2I Applications

- **Curve Speed Warning:** Alerts drivers approaching a curve to slow down if their vehicle speed is too high to travel safely through the curve.

- **Oversize Vehicle Warning:** Alerts drivers if their vehicle cannot clear a bridge or tunnel.

- **Pedestrian in Signalized Crosswalk Warning:** Warns transit bus operators when pedestrians walking within the crosswalk of a signalized intersection are in the intended path of the bus.

- **Railroad Crossing Warning:** Alerts drivers approaching an at-grade railroad crossing if they are on a crash-imminent trajectory with a crossing or approaching train.

- **Red Light Violation Warning:** Broadcasts signal phase and timing (SPaT) and other data to the in-vehicle device, allowing warnings to drivers of impending red light violations.

- **Reduced Speed/Work Zone Warning:** Broadcasts alerts to drivers to reduce speed, change lanes, or come to a stop within reduced speed/work zones.

- **Restricted Lane Warning:** Provides drivers with restriction information about the travel lanes (e.g., high occupancy vehicles, transit only, or public safety vehicles only).

- **Smart Roadside - Wireless Inspection:** Utilizes roadside sensors to provide identification, hours of service, and sensor data directly from trucks to carriers and government agencies.

Photo Source: USDOT

U.S. Department of Transportation

- **Smart Roadside - Smart Truck:** Provides information such as hours-of-service constraints, location and supply of parking, travel conditions, and loading/unloading scheduling to allow commercial drivers to make advanced route planning decisions.

- **Spot Weather Impact Warning:** Warns drivers of local hazardous weather conditions by relaying weather data from the management center and other sources to roadside equipment, which then re-broadcasts to nearby vehicles.

- **Stop Sign Gap Assist Warning:** Uses traffic information broadcast from roadside equipment to warn drivers of potential collisions at stop-sign intersections.

- **Stop Sign Violation Warning:** Provides warnings to drivers approaching an unsignalized intersection when their speed and distance to the stop sign is such that they may not perform the required stop.

- **Warnings about Hazards in a Work Zone:** Provides warnings to maintenance personnel within a work zone about potential hazards within the work zone (e.g., a vehice traveling at a high speed or entering the work zone).

- **Warnings about Upcoming Work Zone:** Provides approaching vehicles with information about work zone activities, such as travel lane obstructions, lane closures, lane shifts, speed reductions, or vehicles entering/exiting the work zone.

V2V Applications

- **Blind Spot/Lane Change Warning:** Warns drivers attempting a lane change if there is a vehicle in their blind spot.

- **Control Loss Warning:** Enables a vehicle to broadcast a self-generated, control-loss event to surrounding vehicles.

- **Do Not Pass Warning:** Alerts drivers prior to a passing maneuver if there is a potential for a head-on collision.

- **Emergency Electronic Brake Lights:** Alerts downstream drivers to hard braking ahead, providing them additional reaction time.

- **Emergency Vehicle Alert:** Alerts surrounding drivers about the location and movement of public safety vehicles responding to an incident in the vicinity.

- **Forward Collision Warning:** Alerts drivers if there is a direct and imminent threat of collision ahead of the host vehicle. The application helps drivers avoid or mitigate the severity of rear-end crashes with the upstream vehicle.

- **Intersection Movement Assist:** Warns drivers when it is not safe to enter an intersection due to a high probability of collision with other vehicles.

- **Left Turn Assist:** Alerts drivers attempting an unprotected left turn across traffic when there is a high probability of a collision with traffic from the opposite direction.

- **Pre-Crash Actions:** Enables a vehicle to mitigate injuries in a crash by activating in-vehicle countermeasures when a crash is about to happen.

- **Situational Awareness:** Determines whether the road conditions measured by other vehicles represent a potential safety hazard for the vehicle containing the application.

- **Tailgating Advisory:** Uses information from other vehicles to determine whether the vehicle is too close to the vehicle in front of it.

- **Transit Vehicle at Station/Stop Warning:** Informs nearby vehicles of the presence of a transit vehicle at a station or stop. The application also indicates the intention of the transit vehicle to pull into or out of a station/stop.

- **Vehicle Emergency Response:** Provides public safety vehicles with information from connected vehicles involved in a crash (e.g., HAZMAT data, air bag deployment, type of vehicle power systems).

- **Vehicle Turning Right in Front of Transit Vehicle Warning:** Warns transit bus operators of the presence of vehicles attempting to go around the bus as it leaves a stop.

V2P Application

- **Transit Pedestrian Indication:** Informs pedestrians at a station or stop of the presence of a transit vehicle. It also informs the transit vehicle operator of the presence of pedestrians nearby.

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