Vehicle Safety Communications – Applications (VSC-A) Project: Crash Scenarios and Safety Applications

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VSC-A System Development – Selection of Safety Applications

- Selection of the VSC-A safety applications based on a US DOT crash scenarios study[1]

- Selection process of the applications also considered:
  - Taking advantage of 5.9 GHz DSRC omnidirectionality & range to build system with set of safety applications running simultaneously
  - Including currently challenging scenarios (for radar & vision) such as intersecting and oncoming direction paths

- The VSC-A Team and USDOT are jointly "mapping" the proposed safety applications (from the VSC-A Technical Proposal) to the recommended crash scenarios

[1] *"VSC-A Applications_NHTSA - CAMP Comparison v2" document, USDOT, May 2 2007*

VSC-A Test Bed System Development
Mapping of applications to crash scenarios

	V2V Safety Applications / Crash Scenarios	EEBL	FCW	BSW	LCW	DNPW	IMA	CLW
1	Lead Vehicle Stopped		✓					
2	Control Loss without Prior Vehicle Action							✓
3	Vehicle(s) Turning at Non-Signalized Junctions						✓	
4	Straight Crossing Paths at Non-Signalized Junctions						✓	
5	Lead Vehicle Decelerating	✓	✓					
6	Vehicle(s) Not Making a Maneuver – Opposite Direction					✓		
7	Vehicle(s) Changing Lanes – Same Direction			✓	✓			
8	LTAP/OD at Non-Signalized Junctions						✓	

Note: Crash Scenario reference: "VSC-A Applications_NHTSA-CAMP Comparison v2" document, USDOT, May 2 2007. Selected based on 2004 General Estimates System (GES) data and Top Composite Ranking (High Freq., High Cost and High Functional Years lost).

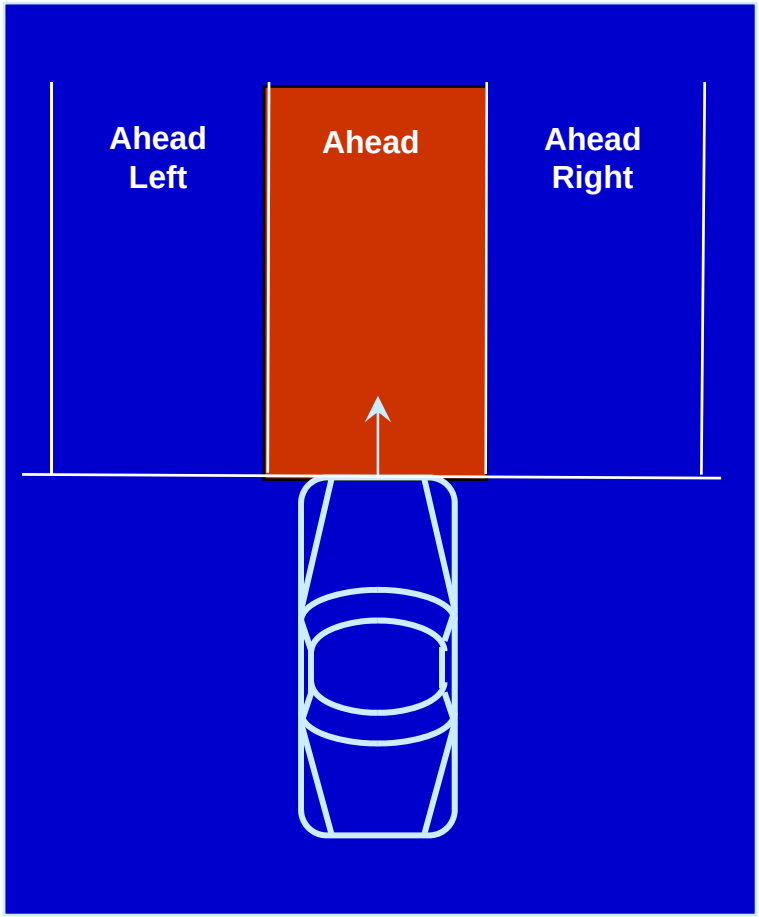
EEBL: Emergency Electronic Brake Lights
FCW: Forward Collision Warning
BSW: Blind Spot Warning
LCW: Lane Change Warning
IMA: Intersection Movement Assist
DNPW: Do Not Pass Warning

Forward Collision Warning (FCW) Application

Definition

Forward Collision Warning (FCW) is a vehicle-to-vehicle (V2V) communication based safety feature that issues a warning to the driver of the host vehicle in case of an impending rear-end collision with a vehicle ahead in traffic in the same lane and direction of travel.

FCW will help drivers in avoiding or mitigating rear-end vehicle collisions in the forward path of travel.

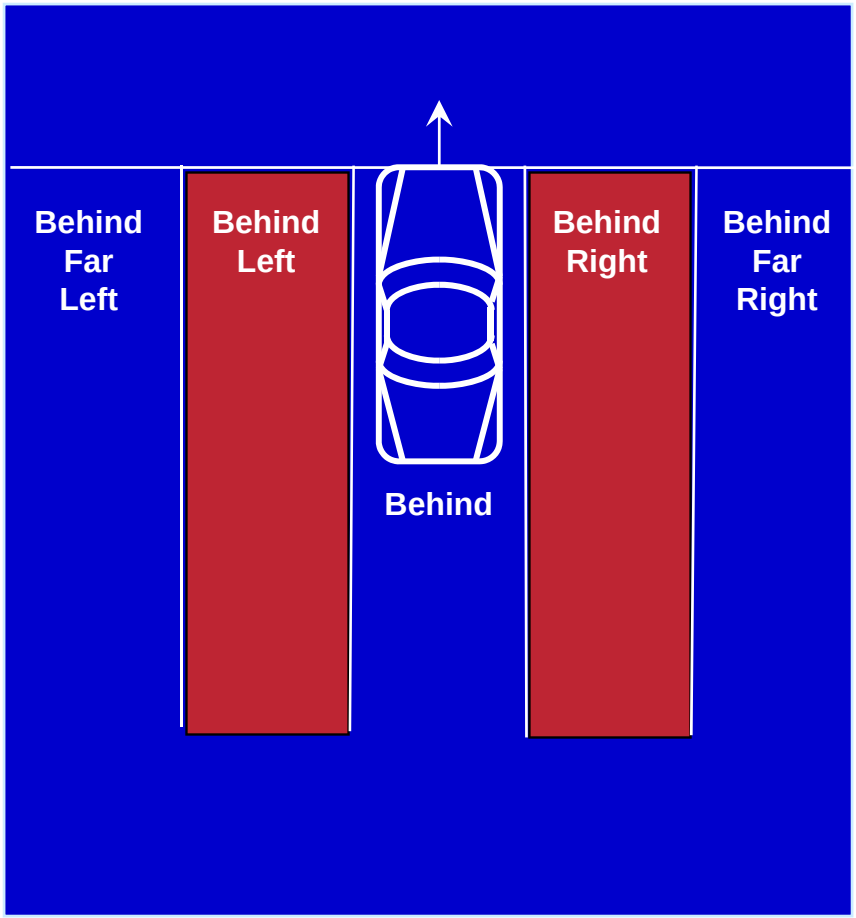


Blind Spot Warning / Lane Change Warning (BSW+LCW) Application

Definition

During a lane change attempt, the Blind Spot Warning / Lane Change Warning (BSW+LCW) application will warn the driver of the host vehicle if the blind spot zone into which the host vehicle intends to switch is, or will soon be, occupied by another vehicle traveling in the same direction

Secondly, the application will provide advisory information to the driver whenever a vehicle in an adjacent lane is positioned in a blind spot zone of the host vehicle

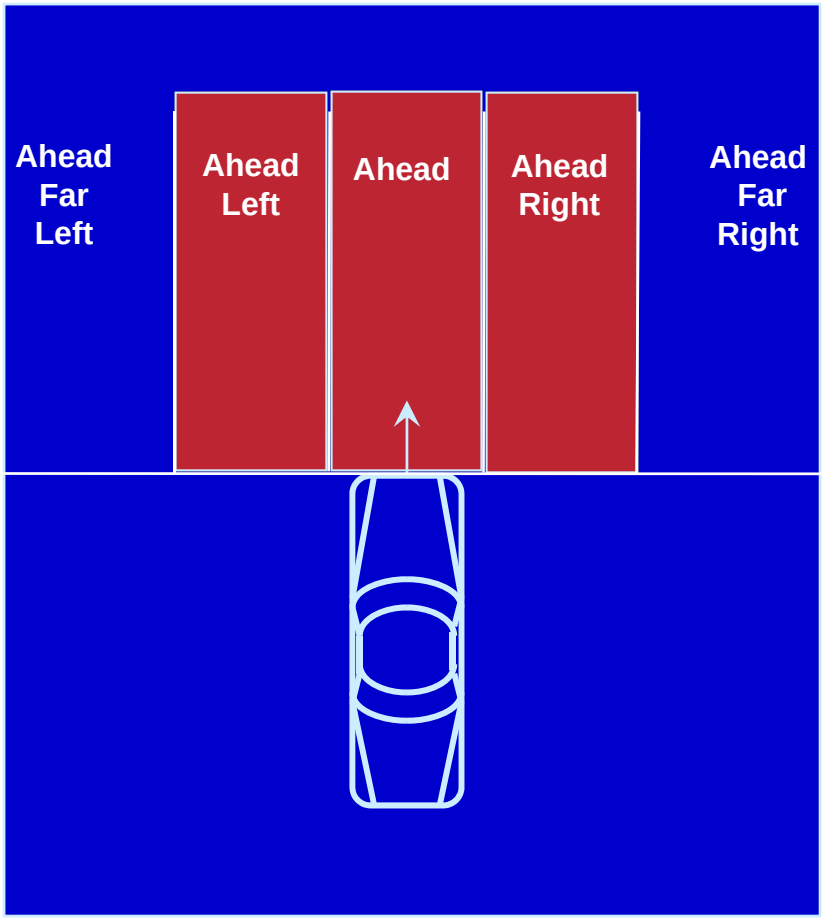


Emergency Electronic Brake Lights (EEBL) Application

Definition

The EEBL application enables a vehicle to broadcast a self-generated emergency brake event to the surrounding vehicles. Upon receiving such event information, the host vehicle determines the relevance of the event and then provides a warning to the driver if appropriate

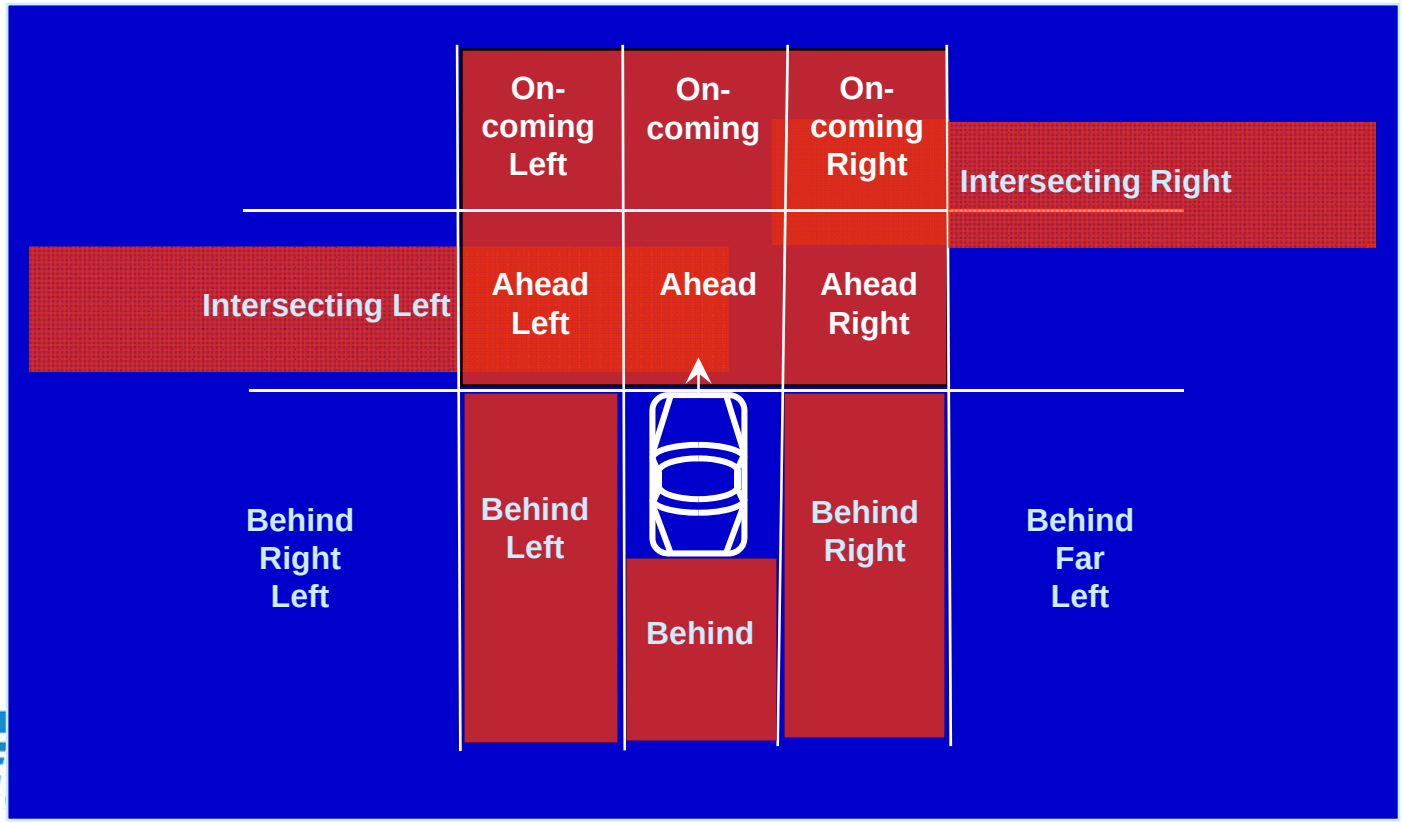
This application is particularly useful when the driver's line of sight is obstructed by other vehicles or bad weather conditions



Control Loss Warning (CLW) Application

Definition

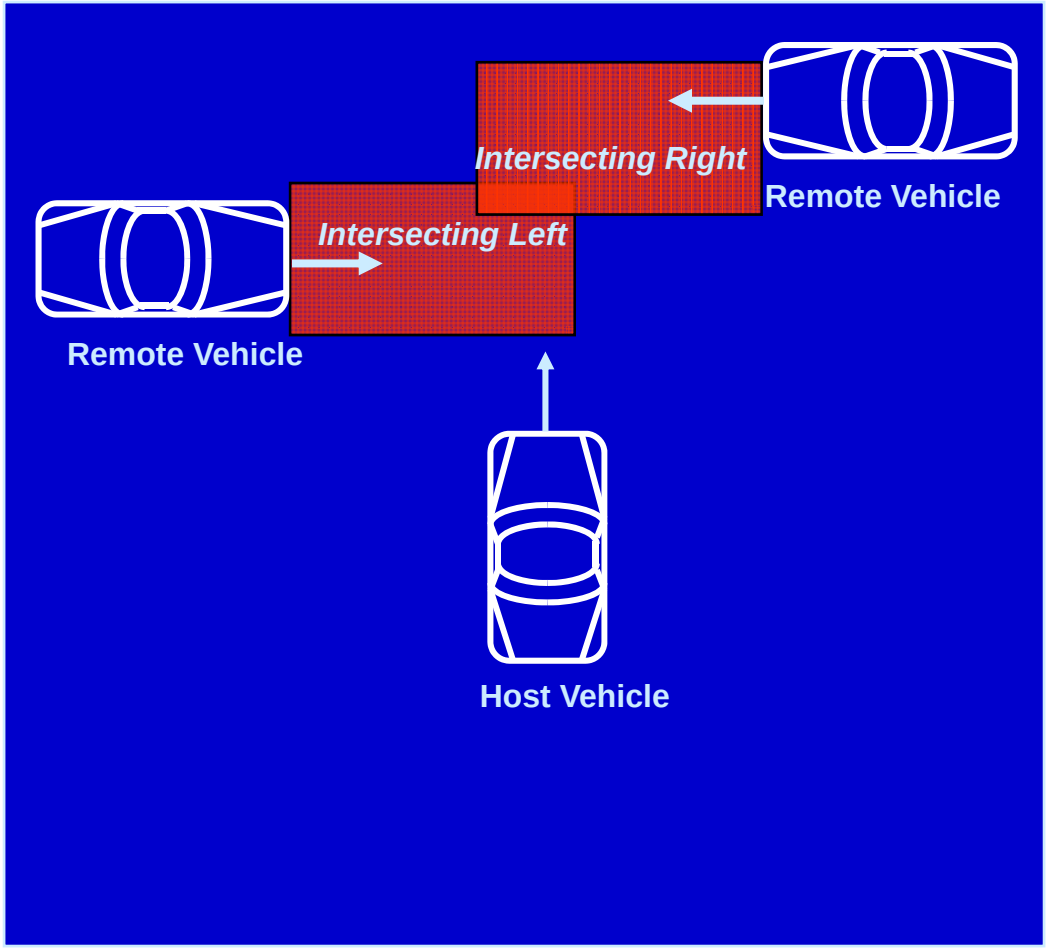
The CLW application enables a vehicle to broadcast a self-generated control loss event to the surrounding vehicles. Upon receiving such event information, the host vehicle determines the relevance of the event and then provides a warning to the driver if appropriate



Intersection Movement Assist (IMA) Application

Definition

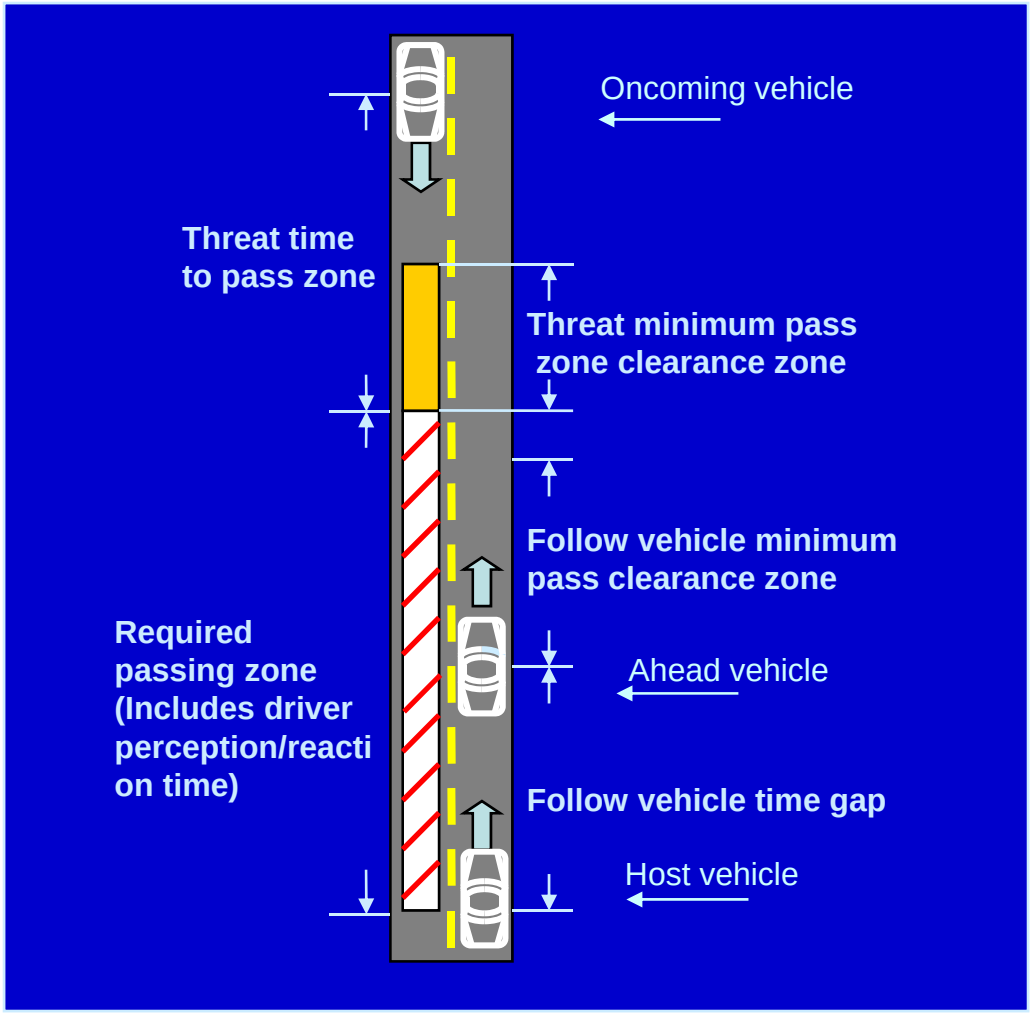
Intersection Movement Assist (IMA) warns the driver of a host vehicle when it is not safe to enter an intersection due to high collision probability with one or more remote vehicles in cross traffic



Do Not Pass Warning (DNPW) Application

Definition

Do Not Pass Warning (DNPW) warns the driver when a slower moving vehicle cannot be safely passed using a passing zone which is occupied by vehicles with the opposite direction of travel



Thank You