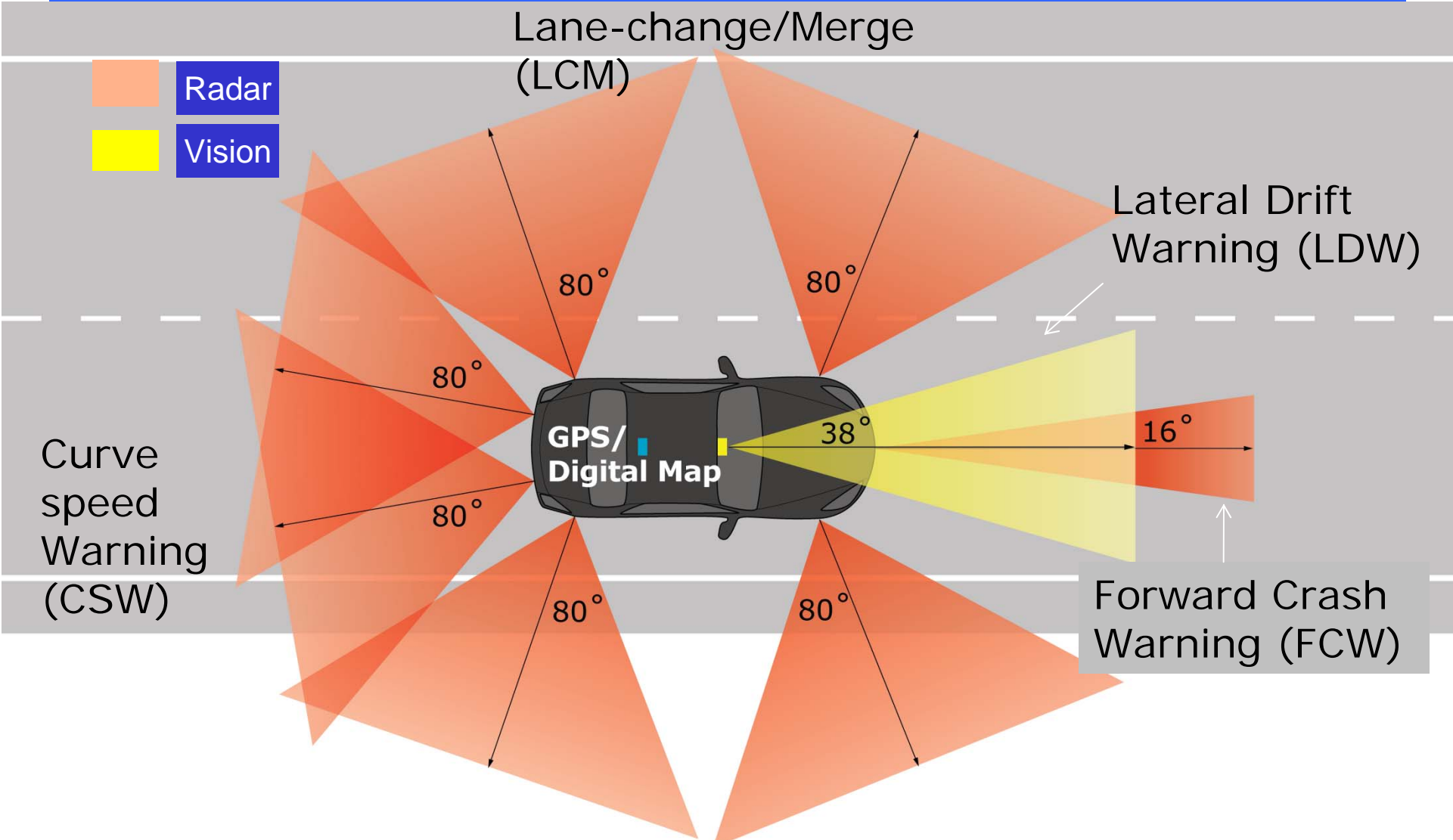


Light Vehicle Platform

Tim Tiernan
Visteon Corporation



Integrated Safety System



- Radar
- Vision

Lane-change/Merge (LCM)

Lateral Drift Warning (LDW)

Curve speed Warning (CSW)

GPS/Digital Map

Forward Crash Warning (FCW)

80°

80°

80°

80°

80°

80°

38°

16°

LCM Description



- Blind-spot detection (BSD): LED in side mirrors indicate threats in the blind spot

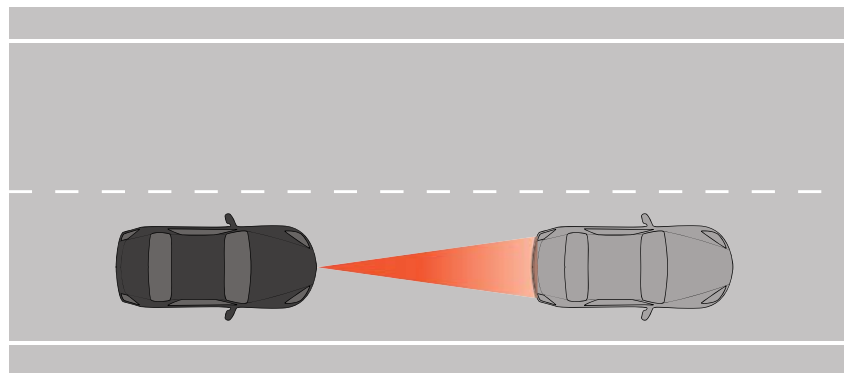


- LCM alerts are intended to help drivers avoid side or rear crashes during INTENTIONAL lane changes
 - Blind-spot zone alerts
 - Closing zone alerts (overtaking vehicles)
 - Integrated display: Audio/visual alert is same as LDW/occupied
 - Transparent to driver: LCM active when driver is signaling (otherwise, LDW acts)



FCW Description

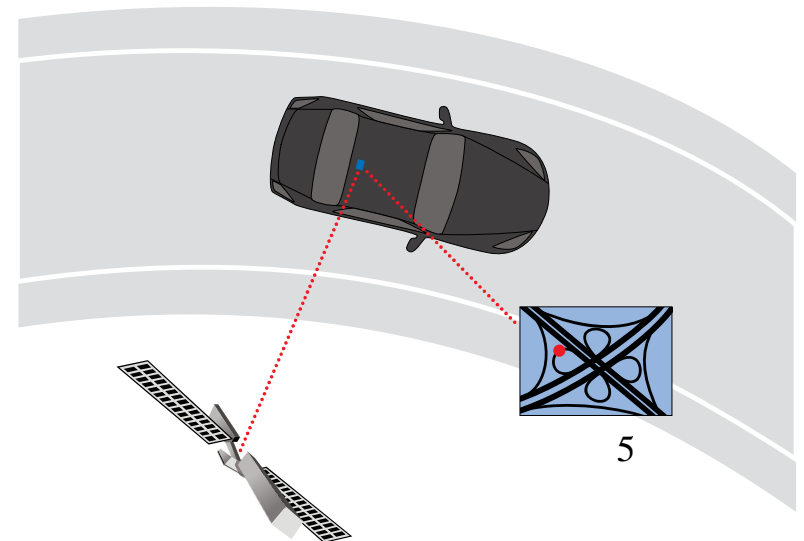
- FCW alerts are intended to help drivers avoid striking the rear-end of another vehicle.
- Features:
 - False alarm database
 - Advanced path prediction including CSW map & radar scene-tracking information



CSW Description



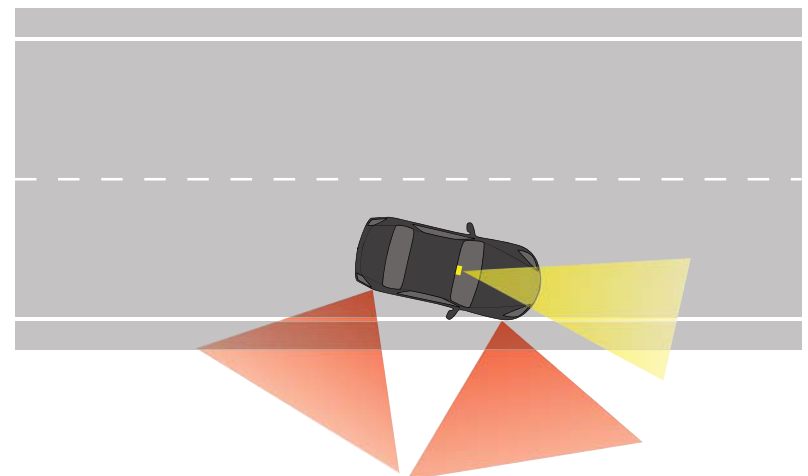
- Alert the driver if significant braking is needed to avoid too-fast travel through an upcoming curve
- Features:
 - Advanced curvature estimation techniques
 - Use of LDW boundary types
 - False Alarm Database (FADB)



LDW Description



- LDW alerts are intended to help drivers avoid unintentional lane drifts
 - Cautionary: Adjacent space not occupied (haptic/visual)
 - Imminent: Adjacent space occupied (audible/visual)
 - Turn signal or driver braking disables alert
- Features:
 - Improved imaging & tracking
 - False alert suppression

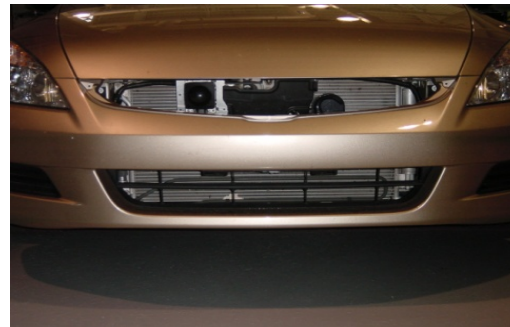




DVI Description

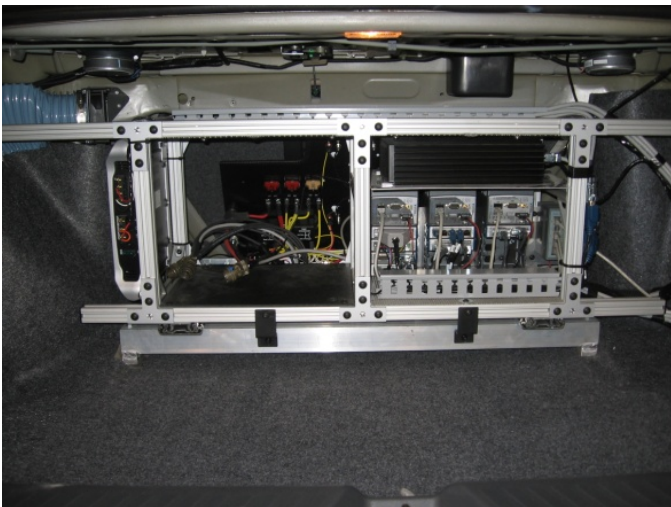
	Forward Alerts		Lateral Alerts		
	FCW	CSW	LCM	LDW Imminent	LDW Cautionary
Auditory	Tone 1		(L) (R) Tone 2		—
Haptic	Brake Pulse	—	—		Haptic Seat L/R
Visual	—		Blind/Closing Zone: Yellow		—
Warning Text	Hazard Ahead	Sharp Curve	Left/Right Hazard		Left/Right Drift
Availability	—	—	—	—	—
System Disabled	IVBSS OFF				
Service	IVBSS Service Required with Tone 3				
Other Service Messages	Clean Front Grill	—	Clean Front/Rear Bumper	Clean Windshield	

Vehicle Integration



Light Vehicle Build Status

FOT Fleet 100 % complete



FOT Readiness



- Verified system performance on road
- Standardized LDW camera calibration, LRR alignment, SRR alignment
- Cold room testing revealed recoverable hard-drive boot issue on CSW module
 - Boots after temperature rises, on next ignition cycle
 - Alternative solid state devices are being investigated
- Ignition Cycling test passed without incident
- Extended pilot results are positive

Pilot and FOT Support



- Collaborate with UMTRI/Volpe to develop subjective instrument
- Listen to debriefs
- Analyze anomalies being reported via cell phone data and determine if corrective action should be taken (vehicle brought in for repair)
- Analyze DAS data to verify valid and nuisance alerts
- 24/7 support for any required repairs/diagnostics
- Two spares of all major hardware components are on hand and will be provided to UMTRI for FOT deployment