

Chemtronics V2X Solution for Connected vehicles

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Overall Information

- ✓ Establishment : Oct. 1983
- ✓ Office : Korea (HQ, 3 Factory), China / Vietnam, US, Europe
- ✓ Revenue : US\$ 299M (18Y)
- ✓ Main Biz : Automotive / Chemical / Electronics

Automotive Business

- ✓ Customers



SSANGYONG MOTOR



삼성전자

- ✓ Partners



车载信息服务产业应用联盟
Telematics Industry Application Alliance



Summary of Automotive Biz history

History

2013	2014	2015	2016	2017	2018	2019
Start mass-production of VGA SVM ECU, Camera for OEMs 	Completion of self-development of V2X technology 	Completion of development of HD SVM and DAS 	AUTOMOTIVE WORLD 2016  MOBILE WORLD CONGRESS BARCELONA 22-25 FEB 2016  2016 MELBOURNE its 2016 World Congress on ITS  CES Consumer Technology Association 	Start mass-production of HD SVM ECU, Camera  Supply V2X System to Autonomous shuttle 	Award from Renault Samsung and Chinese OEM 	Supply V2X System to Sejong Autonomous shuttle 

Basic Core Technology

- ✓ V2X SW Stack / HW / Applications / Manufacture
- ✓ Vision signal processing SW / Image processing algorithms / HW Design
- ✓ Reliability Test and Validation process

V2X : Vehicle to Everything, SVM : Surround View Monitoring System

What is V2X ?

Connect Vehicles with Everything On the Road

What is V2X (Vehicle to Everything)?

Comprehensive
vehicle and traffic
safety

Accelerates
autonomous driving

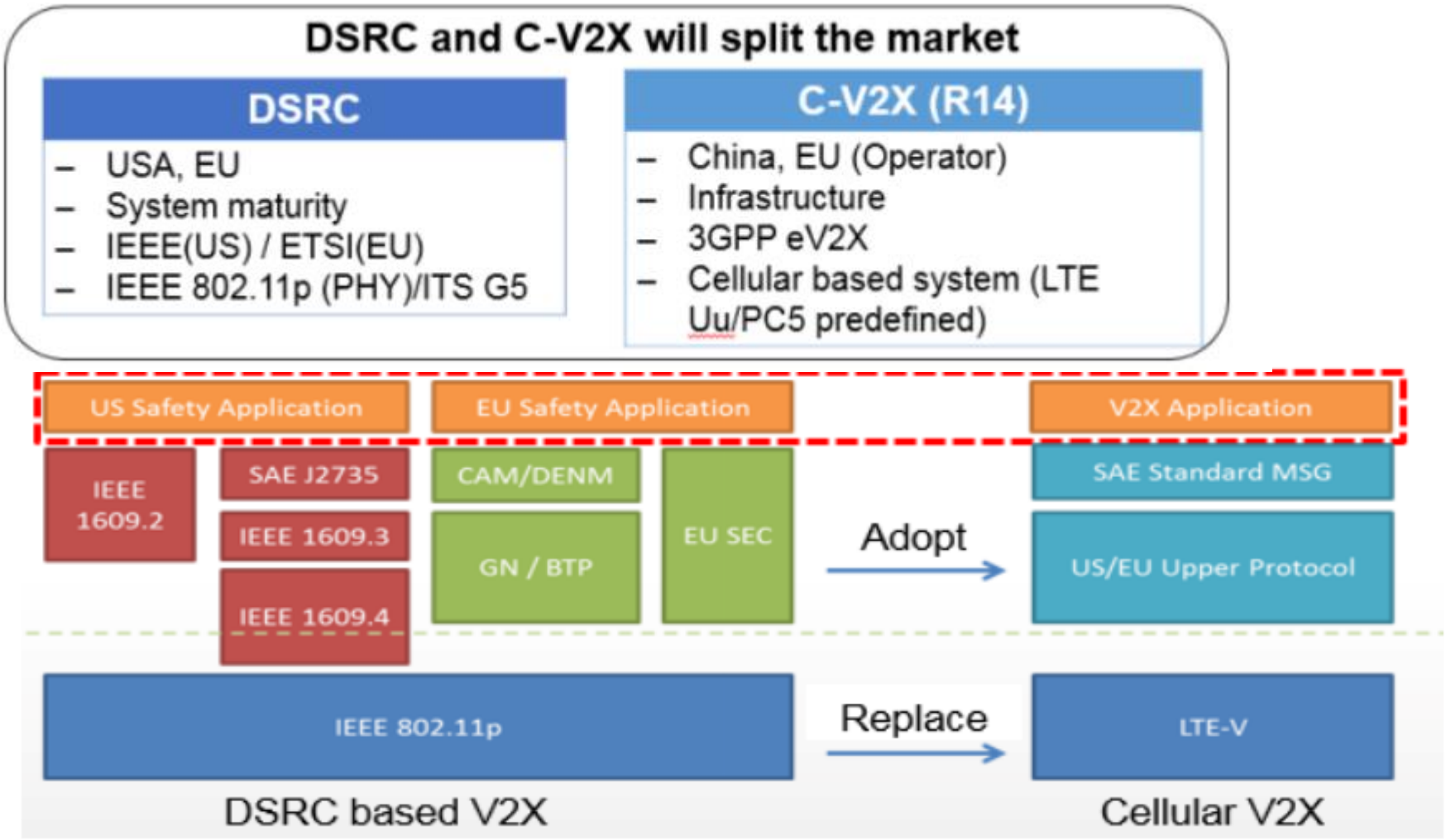
Allows vehicles to
communicate with
each other **V2V**
and the wider
transport ecosystem
V2N, V2P, V2I



Source

Global V2X Standards

DSRC Standards vs. C-V2X Standards








DSRC : Dedicated Short Range Communication, LTE : Long Term Evolution,
C-V2X : Cellular V2X, 3GPP : 3rd Generation Program,

Source : 5GAA

Why V2X : Euro NCAP/Robust Connected Automated Car

For more safe vehicles and more stable automated vehicles

On Board Sensor Capability			LIDAR	Camera	RADAR	V2X & Cellular*	Map & Location
							
Detection Performance	traffic objects	Car / Trucks	☆☆	☆	☆☆☆	☆	
		Motorcycle	☆☆	☆	☆☆	☆	
		Bicycle	☆☆	☆	☆	☆	
		Pedestrian	☆☆☆	☆	☆	☆	
		Animal	☆☆	☆			
		Debris	☆☆	☆			
	infrastructure traffic constraints	Road marking	☆	☆☆			☆☆
		Traffic signs		☆☆			☆☆☆
		Traffic lights		☆☆		☆☆☆	☆
	path / road structure	Curve	☆	☆			
Guard rails		☆☆		☆☆			
Wall/obstacle		☆☆	Dynamic		☆☆	Static	
Robustness		Rain / Snow	☆☆	☆	☆☆☆	☆☆☆	☆☆☆
		Fog			☆☆☆	☆☆☆	☆☆☆
		Night	☆☆☆		☆☆☆	☆☆☆	☆☆☆

*depends on coverage

Communication only based on first ideas

Proposal to release updates out of phase with overall rating

Chemtronics V2X Solution

For more safe vehicles and more stable automated vehicles

**DSRC+LTE Hybrid
OBU**



US/Korea Standard
s compliance

**DSRC+C-V2X
Hybrid OBU**



3GPP / China
Standards
compliance

**DSRC+LTE
Hybrid RSU**



US/Korea
Standards
compliance

**Integrated Hybrid
OBU**

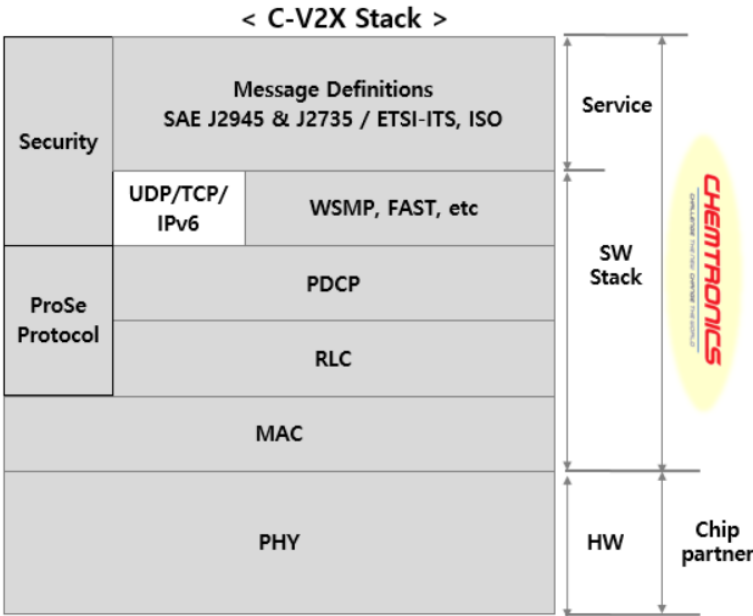
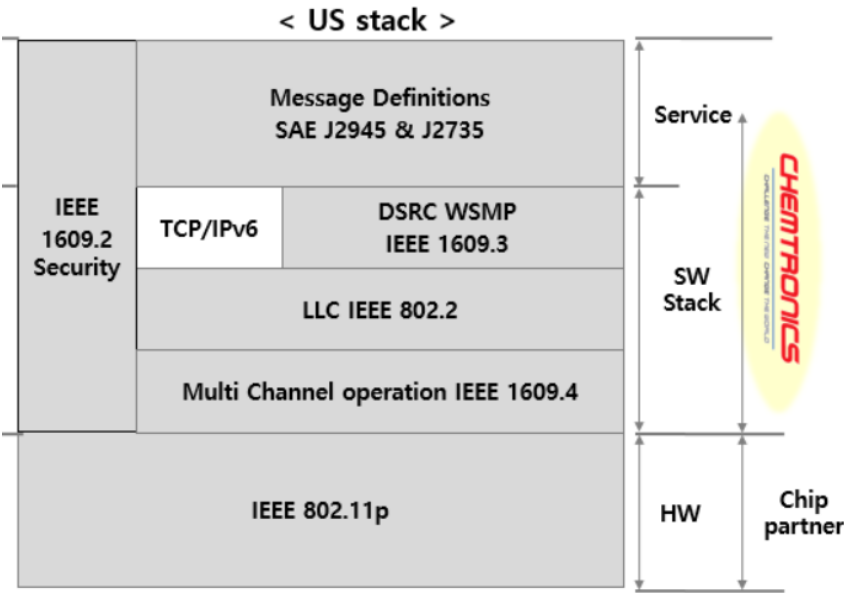


V2X / Broadcasting
integration

*DSRC : Dedicated Short Range Communication, LTE : Long Term Evolution, OBU : On Board Unit,
C-V2X : Cellular V2X, 3GPP : 3rd Generation Partnership Project, RSU : Road Side Unit*

Chemtronics V2X Solution

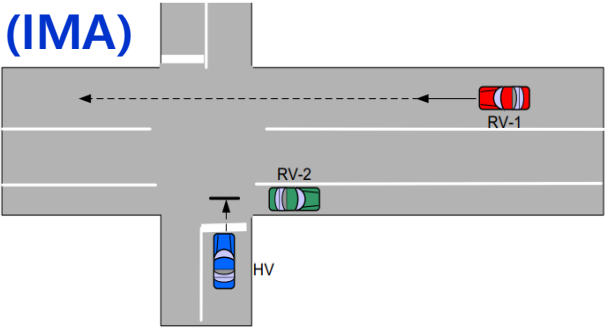
All solutions to meet Global V2X standards



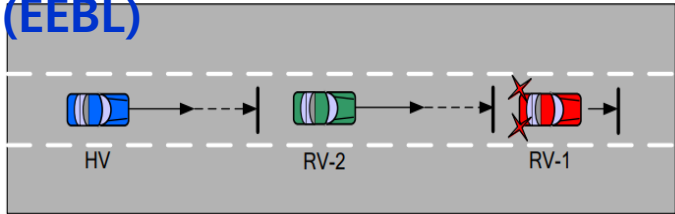
Chemtronics V2X Solution

Applications to make vehicles and people be more safe

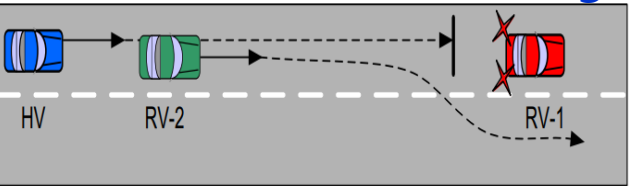
Intersection Movement Assist (IMA)



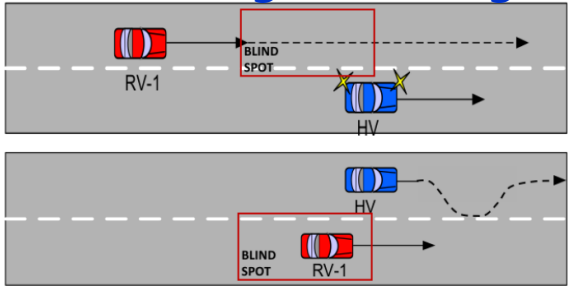
Electronic Emergency Brake Light (EEBL)



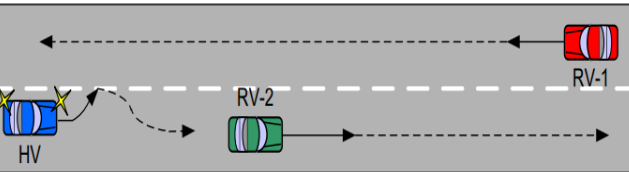
Forward Collision Warning (FCW)



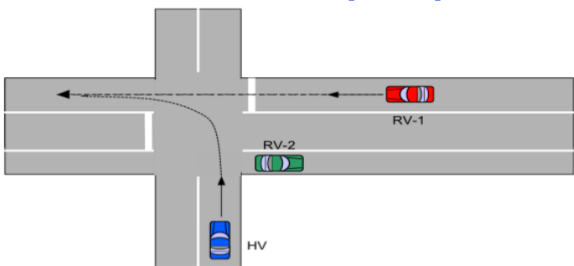
Blind Spot Warning (BSW) / Lane Change Warning (LCW)



Do Not Pass Warning (DNPW)



Left Turn Assist (LTA)

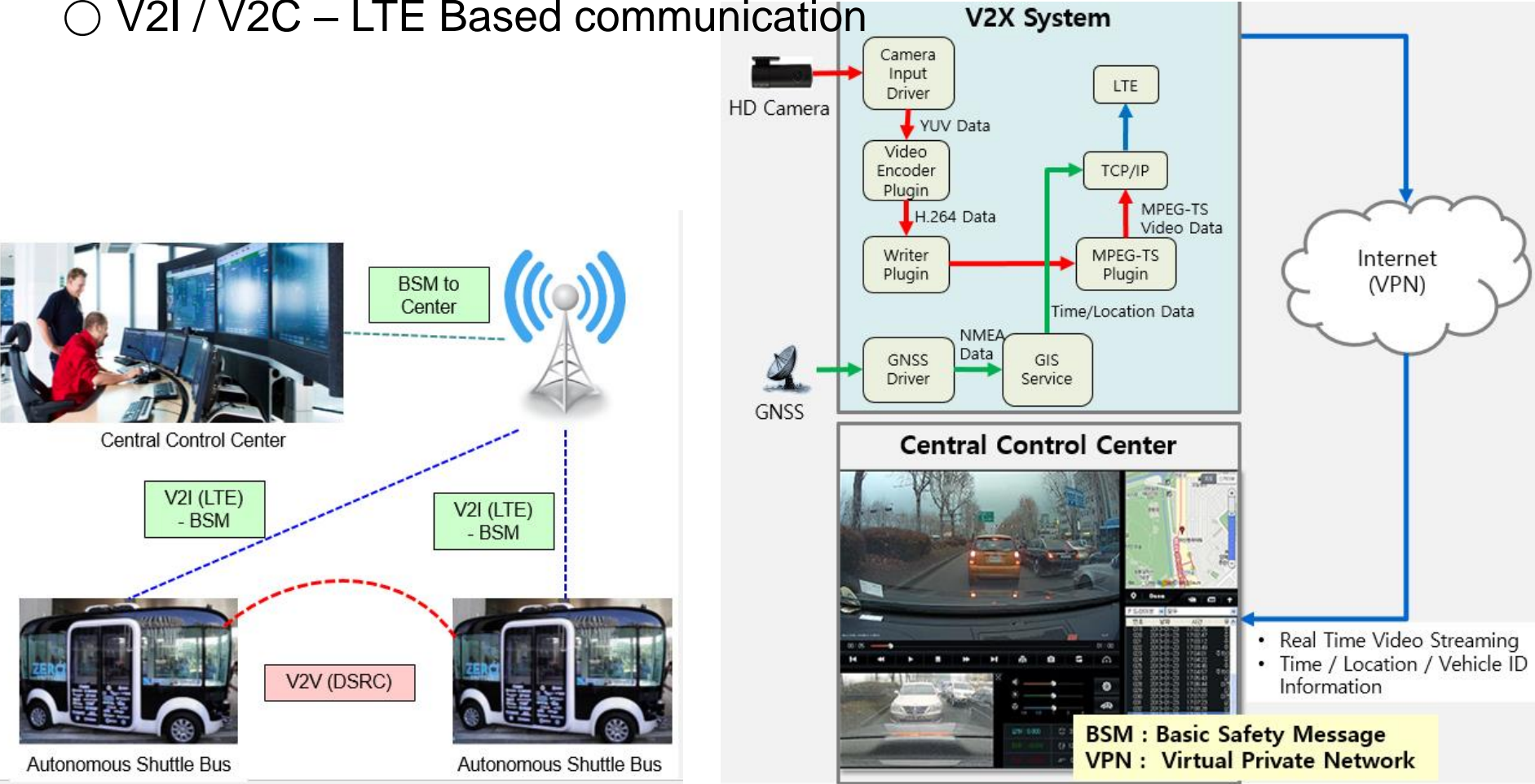


Source : 3GPP

Mass Production for autonomous shuttle bus

◆ Total System Operation Concept

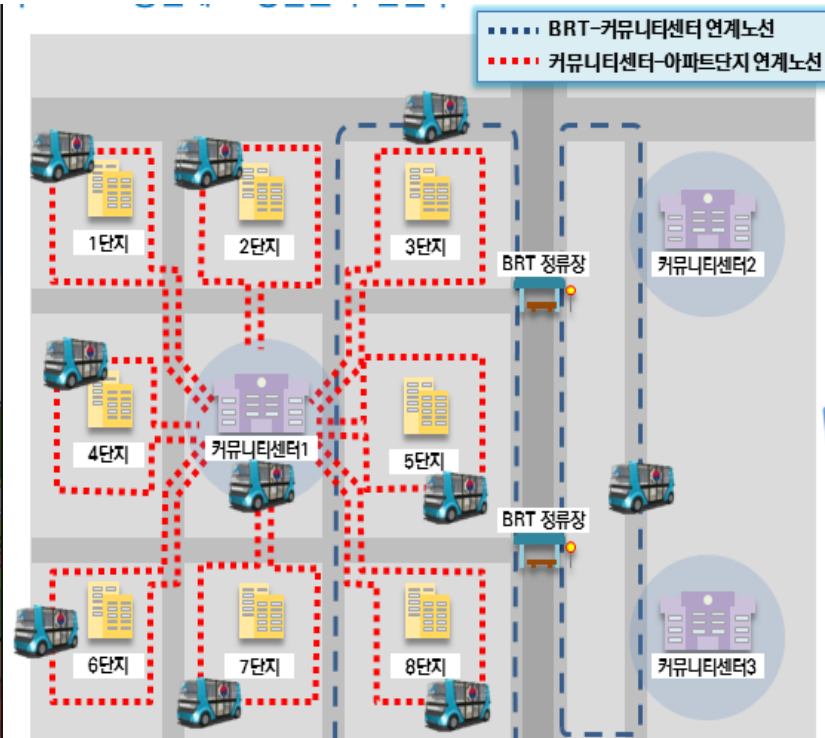
- V2V – DSRC Based communication
- V2I / V2C – LTE Based communication



Mass Production for autonomous shuttle bus

◆ Regulatory - Free Zone Project in Sejong

- Target : Test and demonstration with Autonomous shuttle could be executed under the condition of 4-year grace period of relevant law
- V2X : V2V / V2I linked with traffic infrastructures (WAVE / 4G / 5G)



Topics to be discussed

◆ Global Smart Cities Project

- ✓ V2X System for connectivity with infrastructure
- ✓ Advanced Traffic control system based on V2X Tech.

◆ Smart Highway Project

- ✓ V2X OBUs for Vehicles and V2X RSUs for Road Side
- ✓ Region-specified applications development

Thank You!