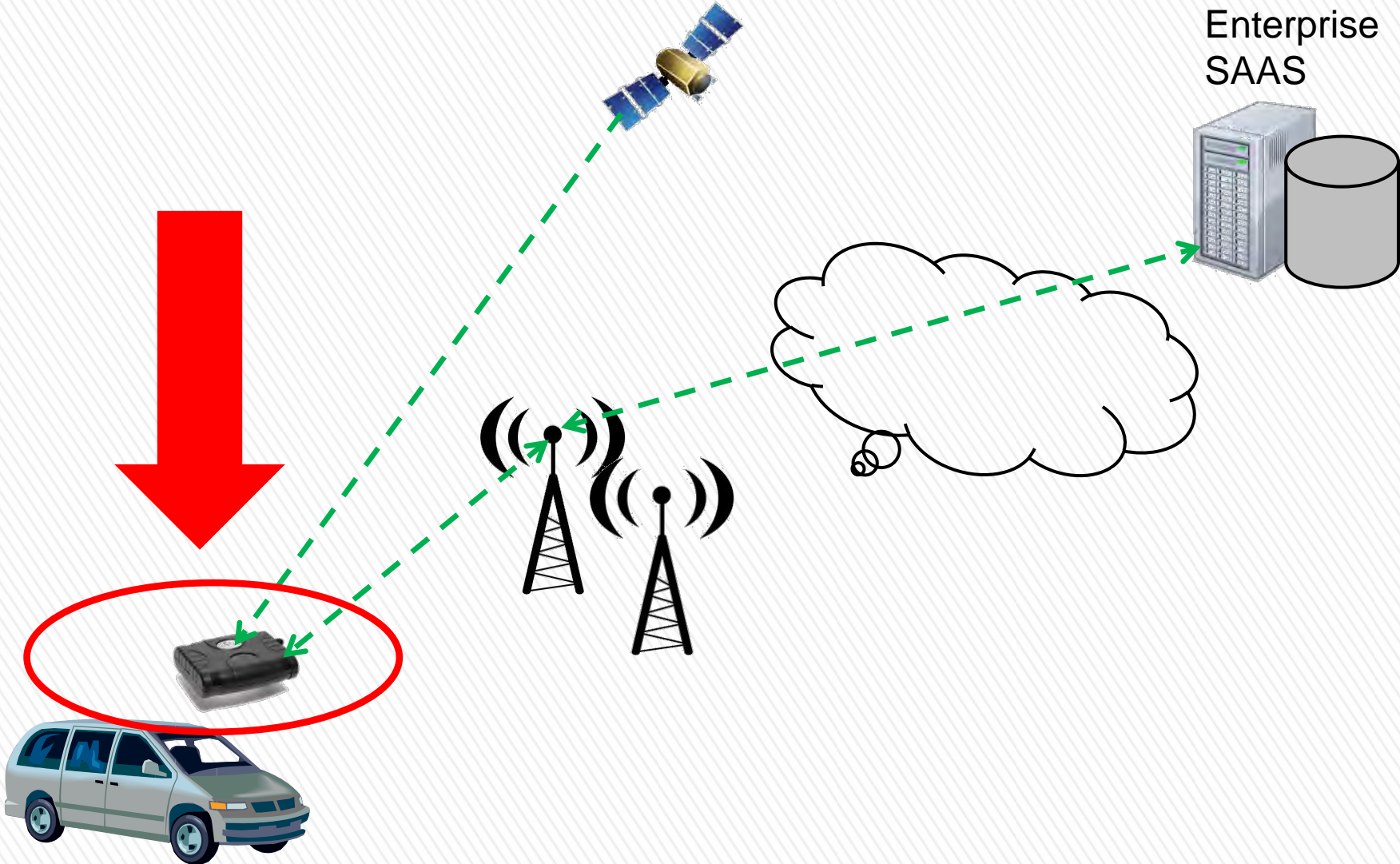


# Legacy Vehicle Telematics



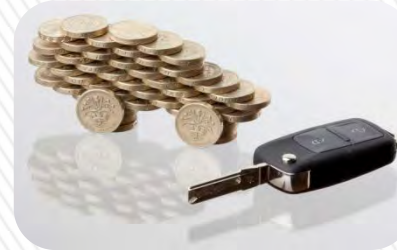
# Applications Review



Safe driving  
E-Call



Security &  
anti fraud



Eco driving



Car sharing



Fleet  
management



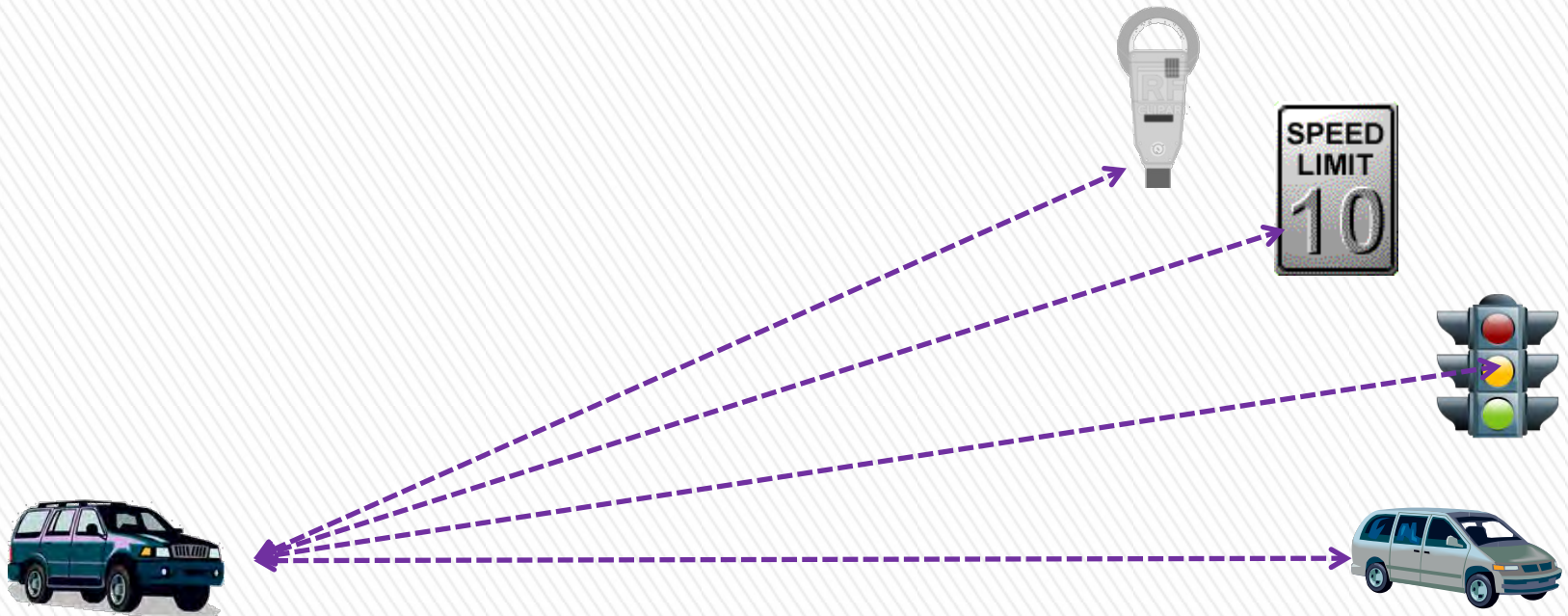
Diagnostics &  
prognostics



Cargo & reefer



# V2X = V2I & V2V



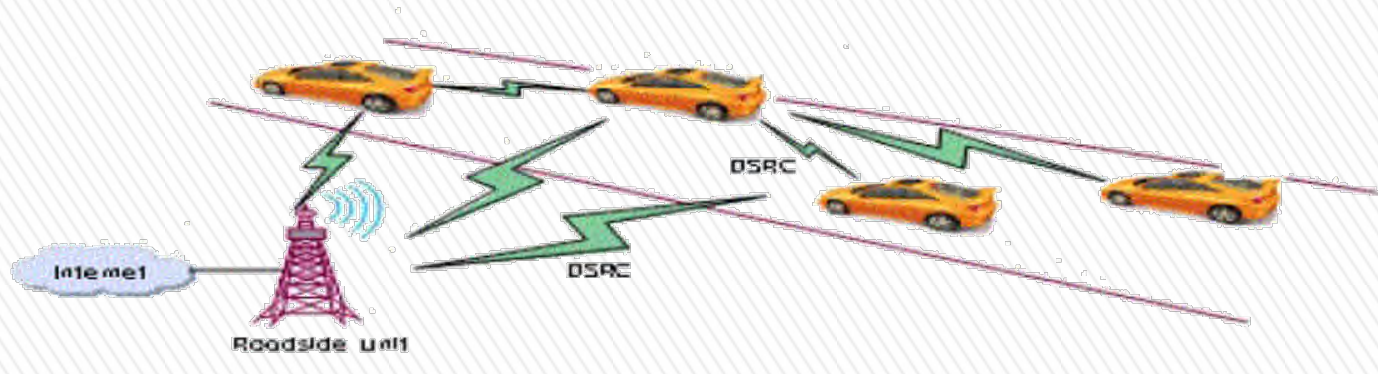
# V2V Basic Warnings

- Emergency break light warning
- Forward collision warning
- Intersection movement assist
- Blind Spot lane change warning
- Control loss warning
- Do not pass warning
- Vehicle stabilization activation
- Weather information

- Vehicle to traffic light
- Vehicle to road sign
- Toll highway detection
- Railway intersection
- Electronic parking (on/off road)
- Garage door opener
- Auto fueling

# DSRC vs. Cellular V2X

## DSRC protocol



## Cellular V2X

### Network communications

V2N on "Uu" interface operates in traditional mobile broadband licensed spectrum

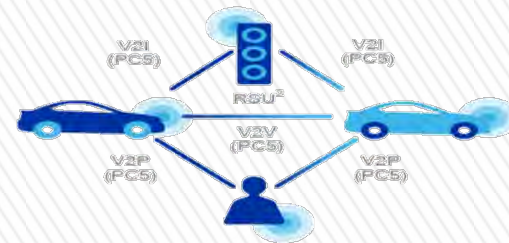
Uu interface  
e.g. accident 2 kilometer ahead



### Direct communications

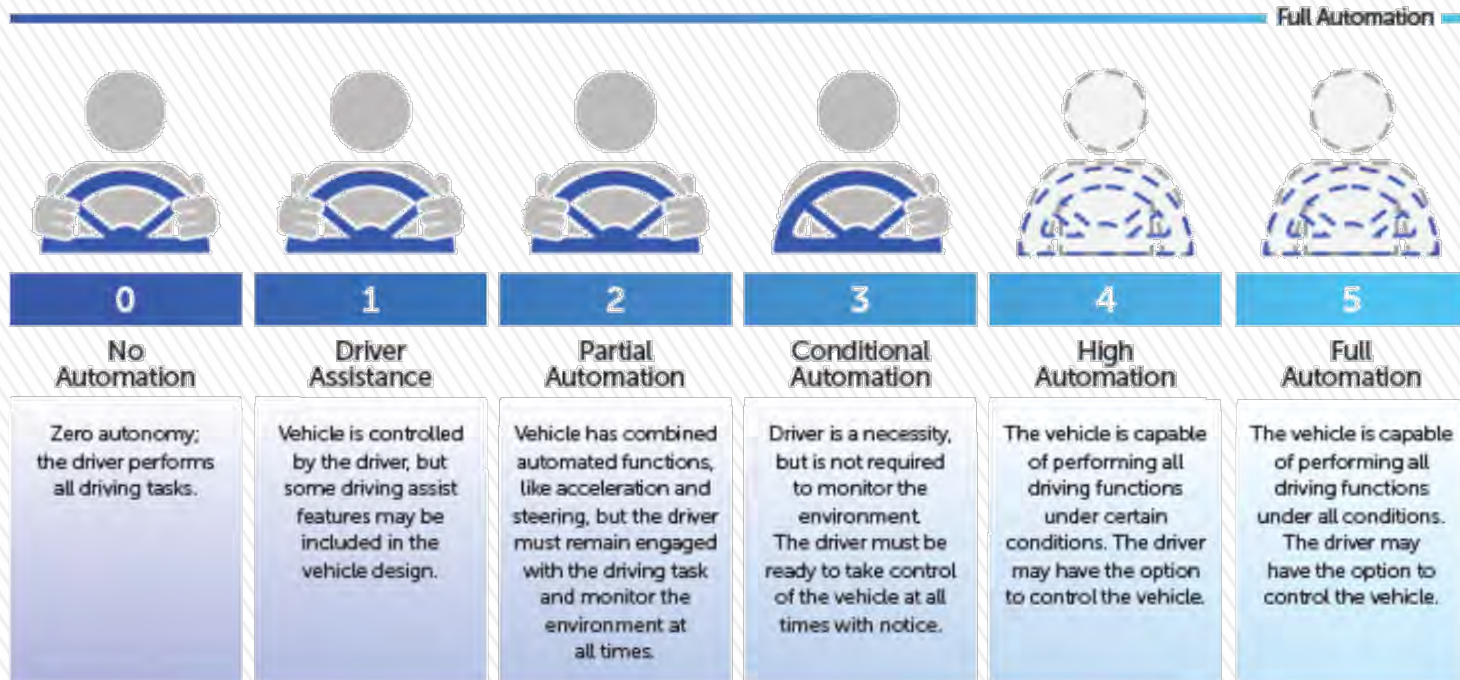
V2V, V2I, and V2P on "PC5" interface<sup>1</sup>, operating in ITS bands (e.g. ITS 5.9 GHz) independent of cellular network

PC5 interface  
e.g. location, speed



# 6 Levels of Autonomous Driving

## SAE AUTOMATION LEVELS



\* Source: Vision for Safety 2.0 (NHTSA)

# Autonomous Technologies



Radar, Lidar  
Ultrasonic



Image processing



HD maps



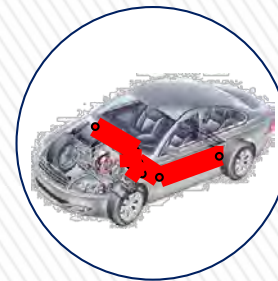
AI  
machine learning



V2X



GPS/GNSS



In - vehicle  
computing & NW



Actuators



# Thank You

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