



# Internet of Cars Within the Internet of Everything

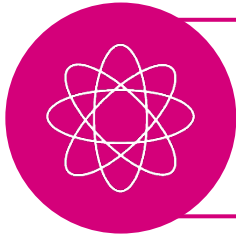
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SEMICON Taiwan 2015 MEMS Forum  
September 2, 2015

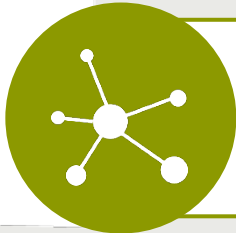


## Defining car technologies of the future



### Ubiquitous computing

- Intelligent environments
- Collaborative innovation networks



### Everything connected

- People, smart things, Vehicle to X
- Mobile technologies



### Societal changes

- Better traffic management
- Safer driving conditions
- Lower impact on the environment

### Smart World

Internet of Things

Smart Environments

Connected car

Wearable technologies

Secure world

## An ecosystem in continuous evolution

### Improving driving efficiency

- Map-assisted guidance
- Geo-localization
- Autonomous car

### Live data & Infotainment

- Satellite broadcasting radio
- Cloud connectivity

### Societal & behavioral changes

- Increased safety & comfort
- Energy saving, CO<sub>2</sub> reduction
- Mobility improvement

### New services

- Insurance & assistance
- Live monitoring maintenance
- Service update

### ST Offer

Infotainment &  
Telematics  
Radio, GNSS

Vehicle electrification  
Power & Smart power

Active safety  
Vision-based ASSP  
Radar

Digital processing  
8/32-bit MCU  
& Multi-core

Wireless Technology  
Vehicle to X

Powertrain & Engine  
Control Unit ASSP

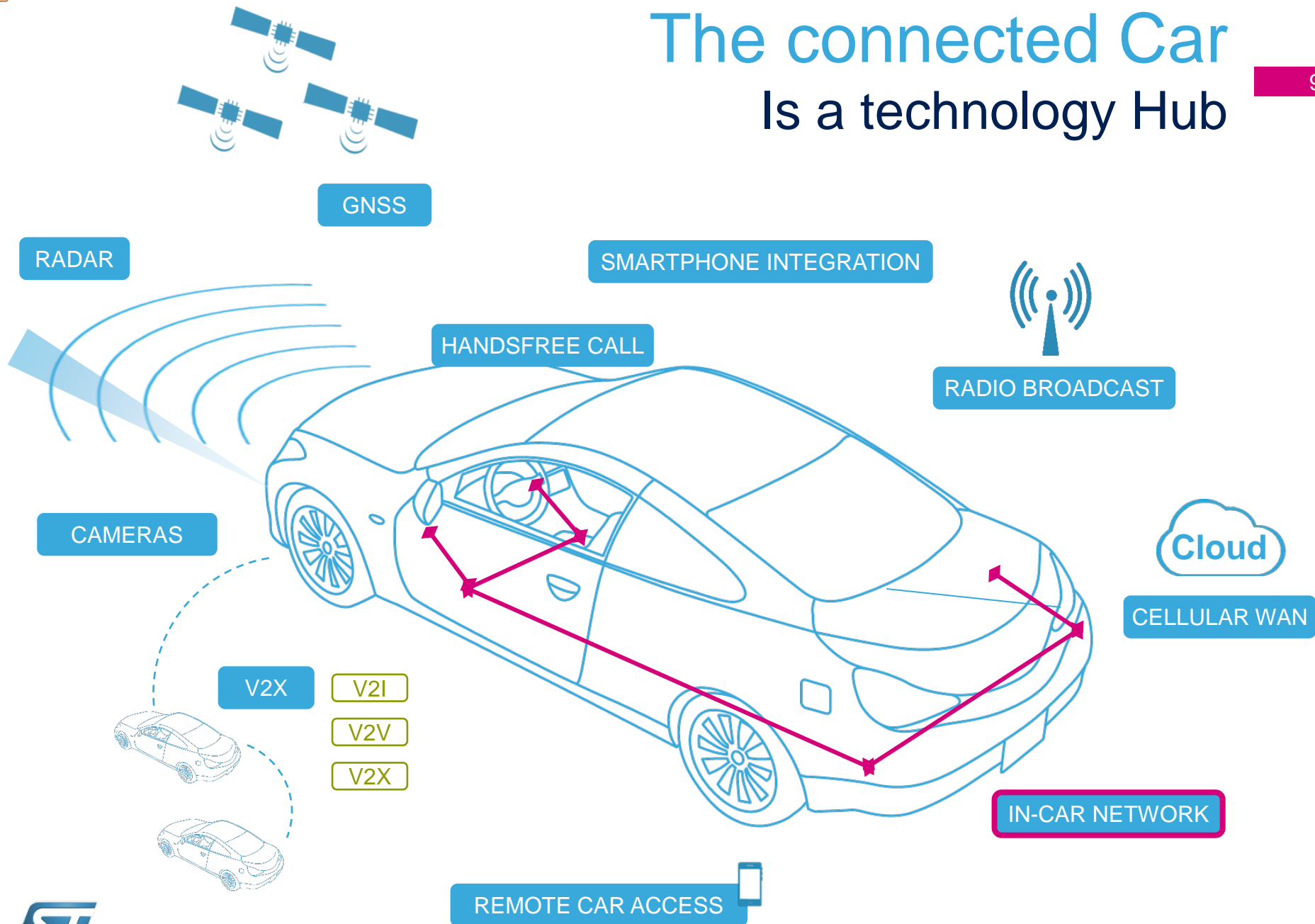
MEMS Sensor

Camera



# The connected Car Is a technology Hub

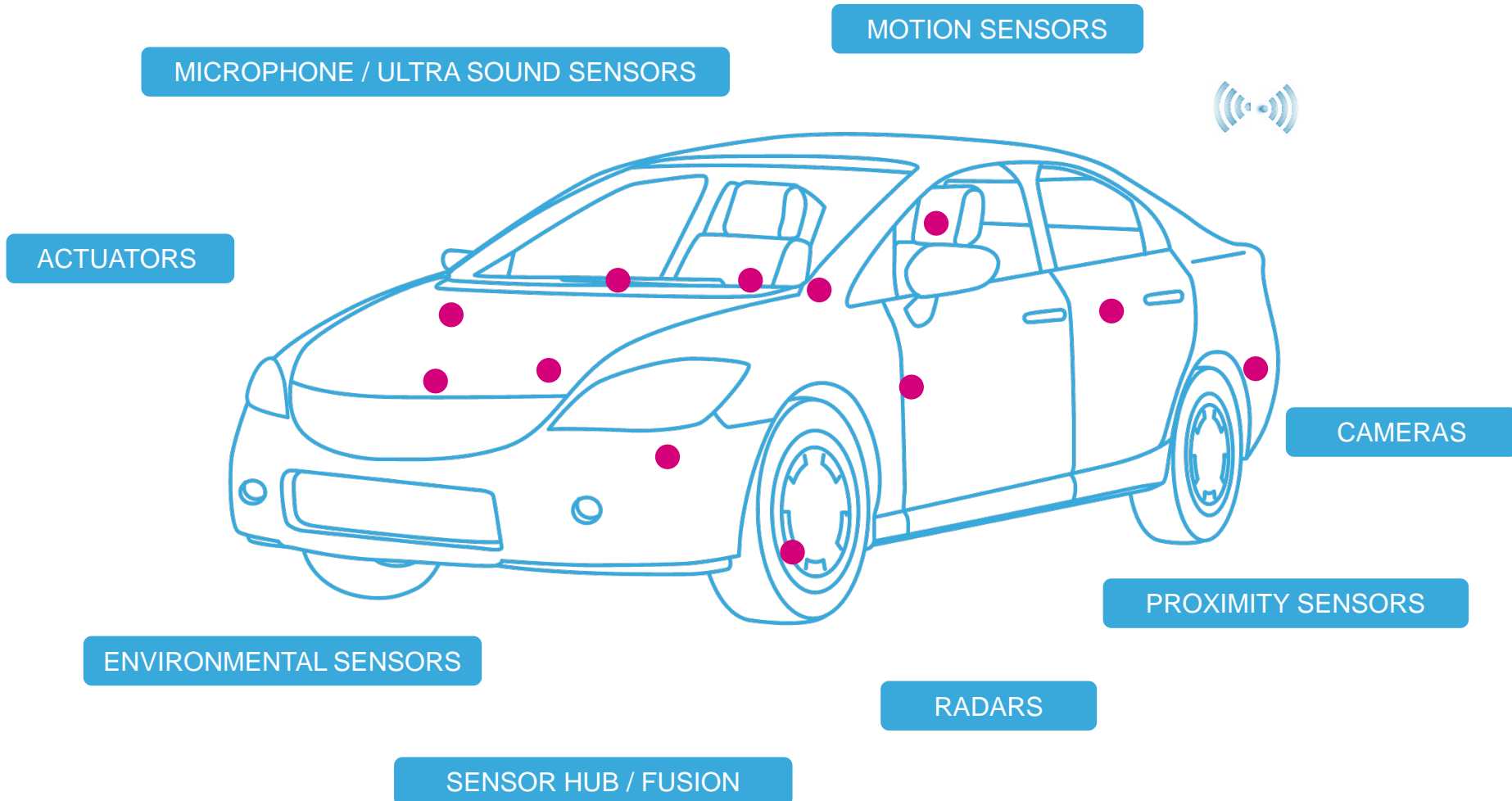
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# Sensor Technologies brings life to the Intelligent Car

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# Assembling the Jigsaw Puzzle

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## The intelligent car by application domain

- Automotive **satellite positioning** with multiple constellations for driving assistance and safety requirements
- **In-Car networks** such as CAN and Ethernet: the backbone of car electronics architecture
- **Cellular WAN** remote connections for OEM apps connected to servers in the cloud, offering free and premium services, including radio broadcasting
- **Remote car access** (keyless entry, remote starter, parking monitor, interactive content for a connected infotainment experience)
- **Engine Control Unit, Body Control Module, safety system monitoring activity**, enhancing car reliability and life, and improving safety
- **Sensor fusion and connected technologies**

## ST Offer

Analog & digital  
tuners

Driver & switches

Multi-constellation  
GNSS

Voltage regulator  
Alternator regulator

Vision based  
processor

Bus transceiver

24/77 GHz  
Transceivers

Motor controller

Super-integrated  
ASIC

8/16/32-bit  
Microcontrollers

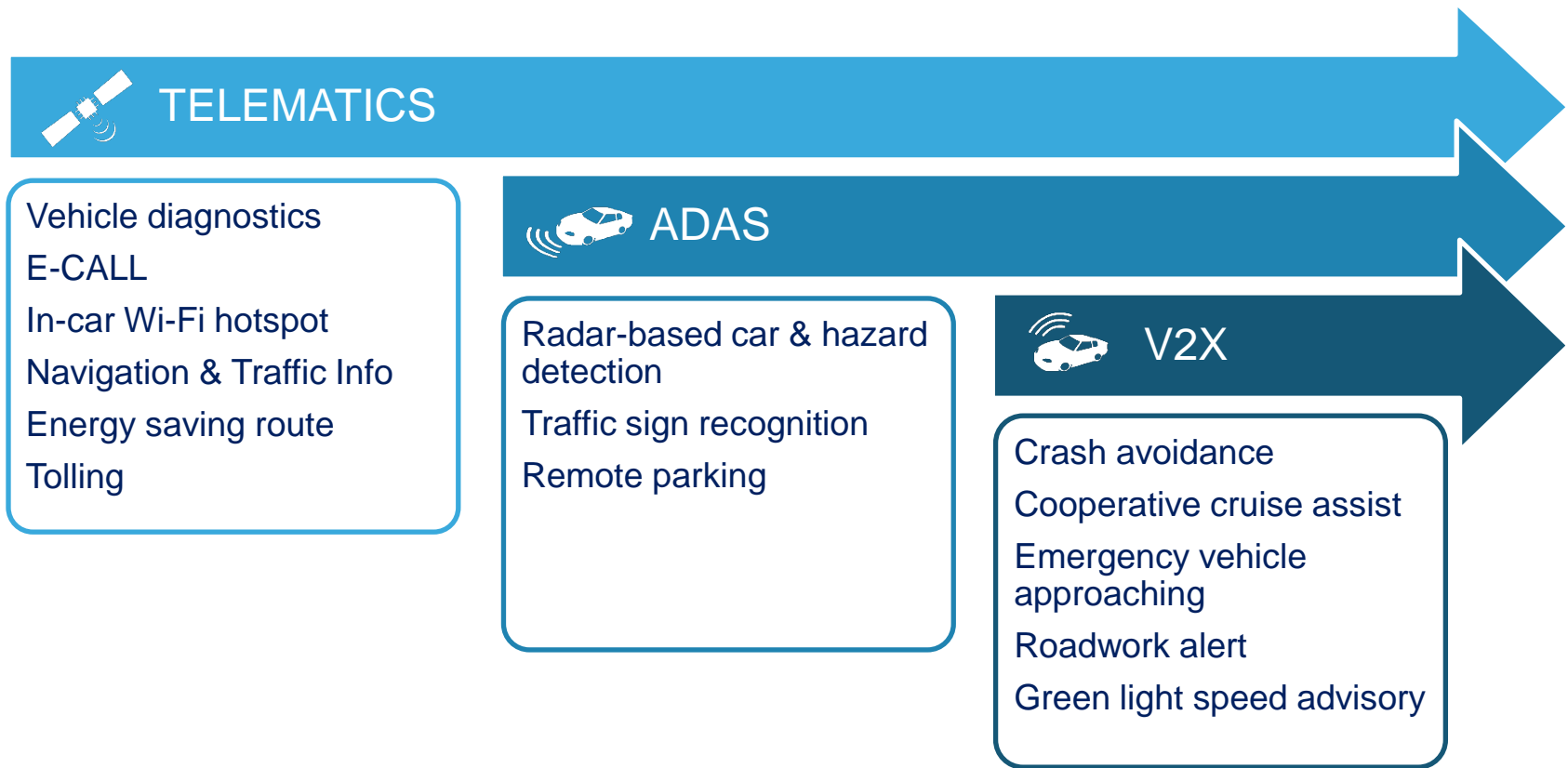
MEMS & Sensors

Cameras

# Safety Feature Proliferation Towards the autonomous Car

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The connected car is revolutionizing the world of transportation

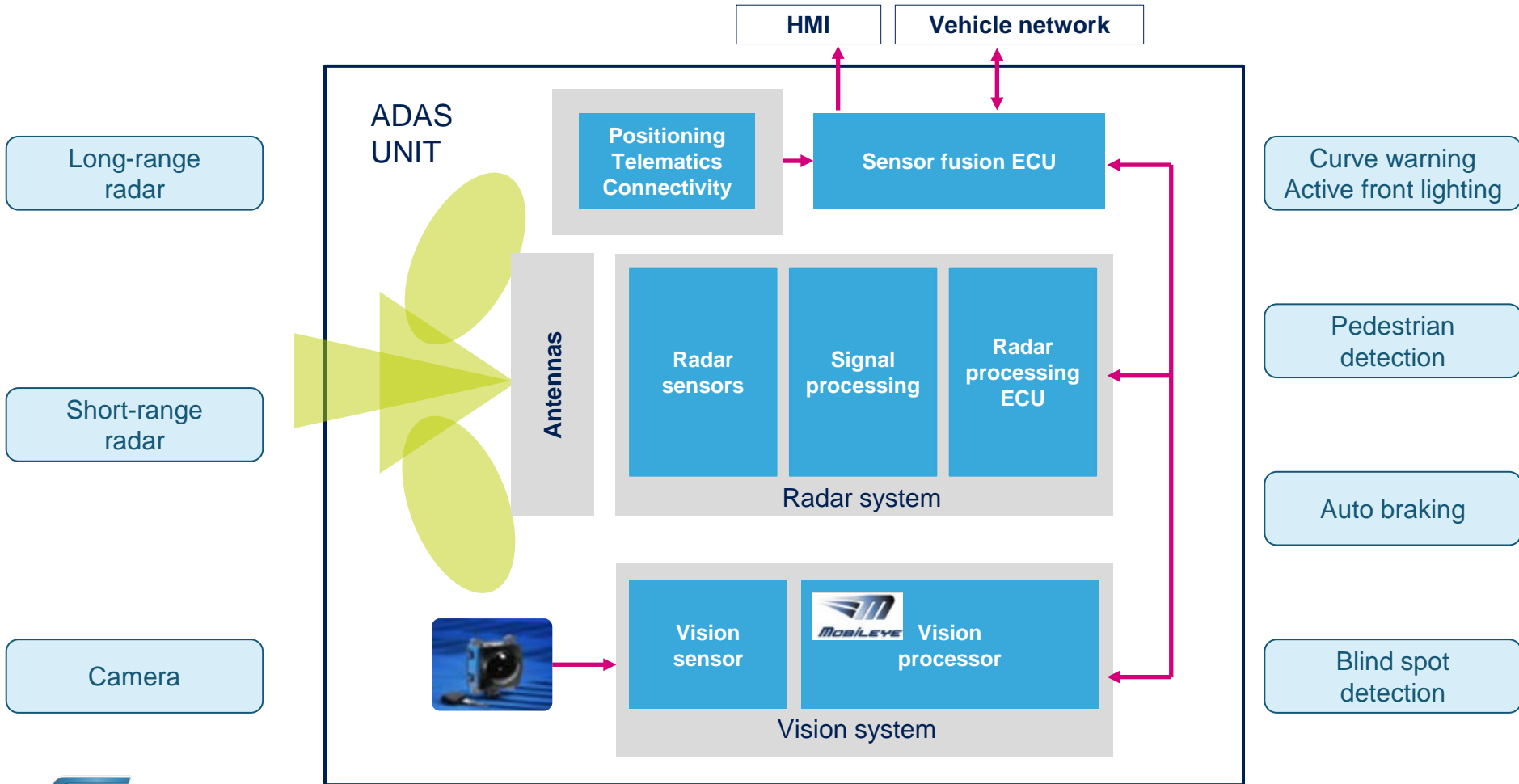




# ADAS System View

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Multiple technologies lead to enhanced safety

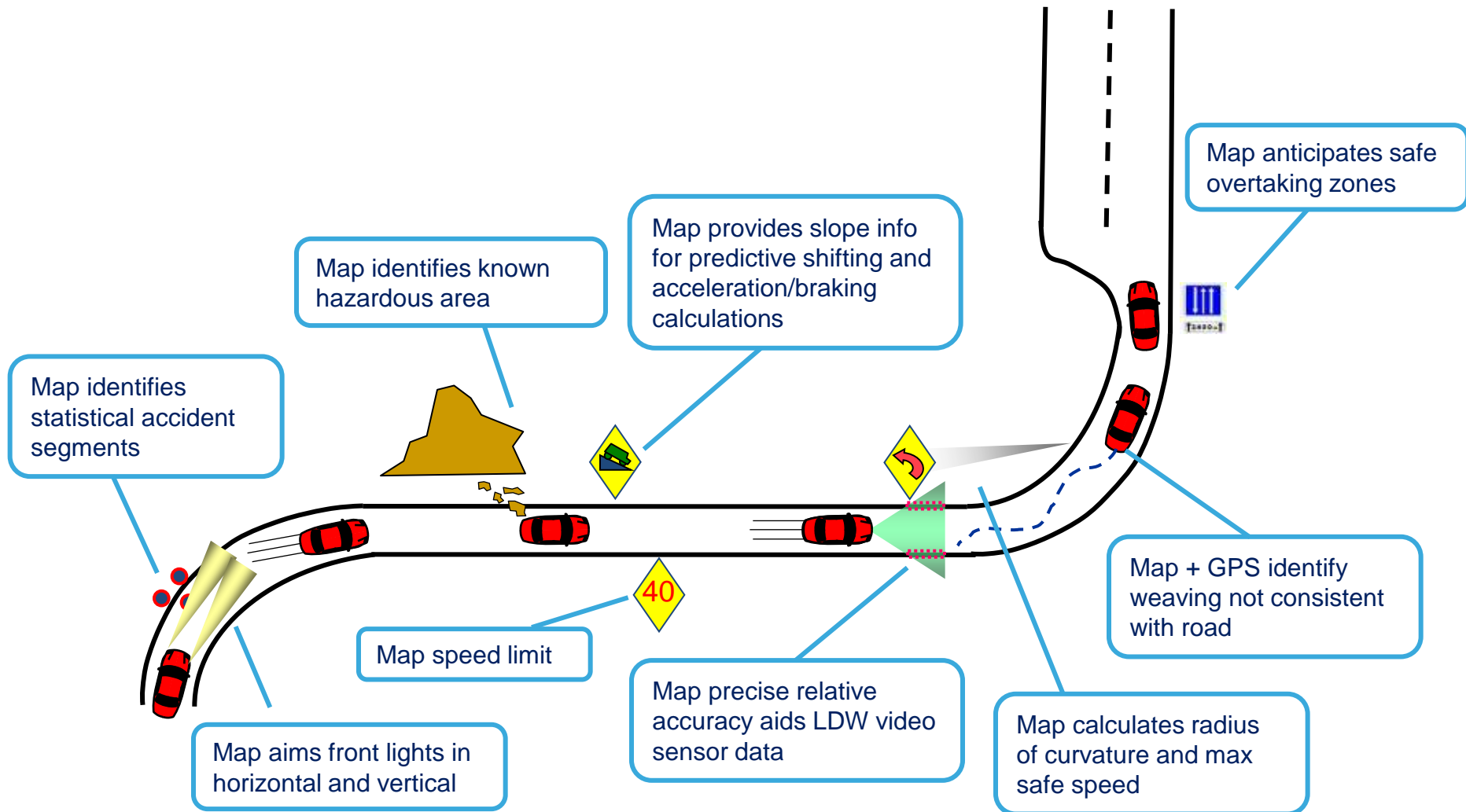




# Map-Based ADAS Applications

## Enhanced value from digital Maps

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# Examples of V2X Safety Functions

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- Blind spot detection, rear cross traffic alert

- Vehicles communicate their position and alert other vehicles of their arrival, also in non-line-of-sight conditions
- Alert space to the danger of a collision when changing lanes or exiting a parking



- Overtaking assist

- Vehicles relay data further along its path and warn other drivers not to overtake
- V2X system tells drivers when it is safe to overtake, estimating the distance between vehicles and their speed of travel

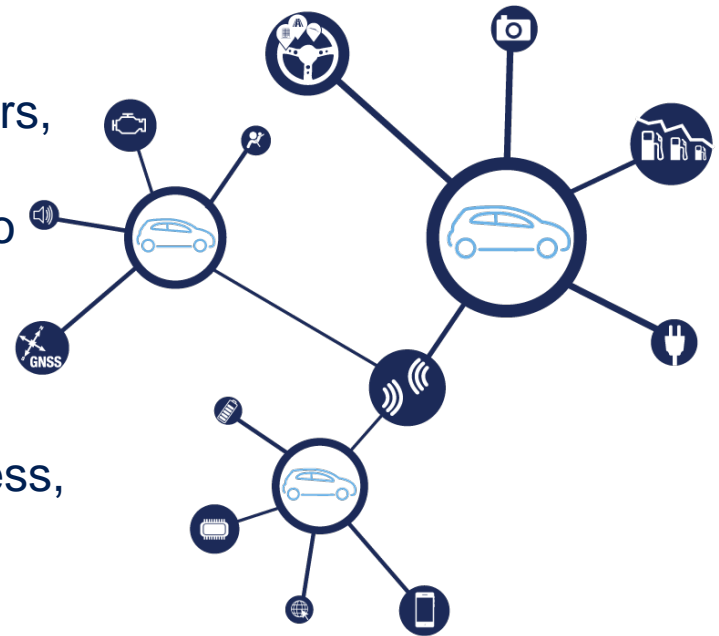


- Electronic brake light

- Driver can be alerted by the emergency braking of a vehicle beyond the driver's sight, hidden by the vehicle in front. The alert will give the driver additional time to react and take evasive action to prevent a collision



- **The car** is a Internet of Things system (a technology Hub) which interacts continuously with the environment, processes and exchanges information among its constituent parts
- **The car** is/will be a node in the Internet of Cars, always connected with the network and other nodes receiving and making available to others information and services
- **The car** is/will be a smart mobile device, connected to everything, enabling the seamless, always available, personal smart world
- Internet of Things and Internet of Cars, together with the technologies and applications involved, will change significantly the car concept and the way cars are used



# Thank You!

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Greener



Safer



More enjoyable