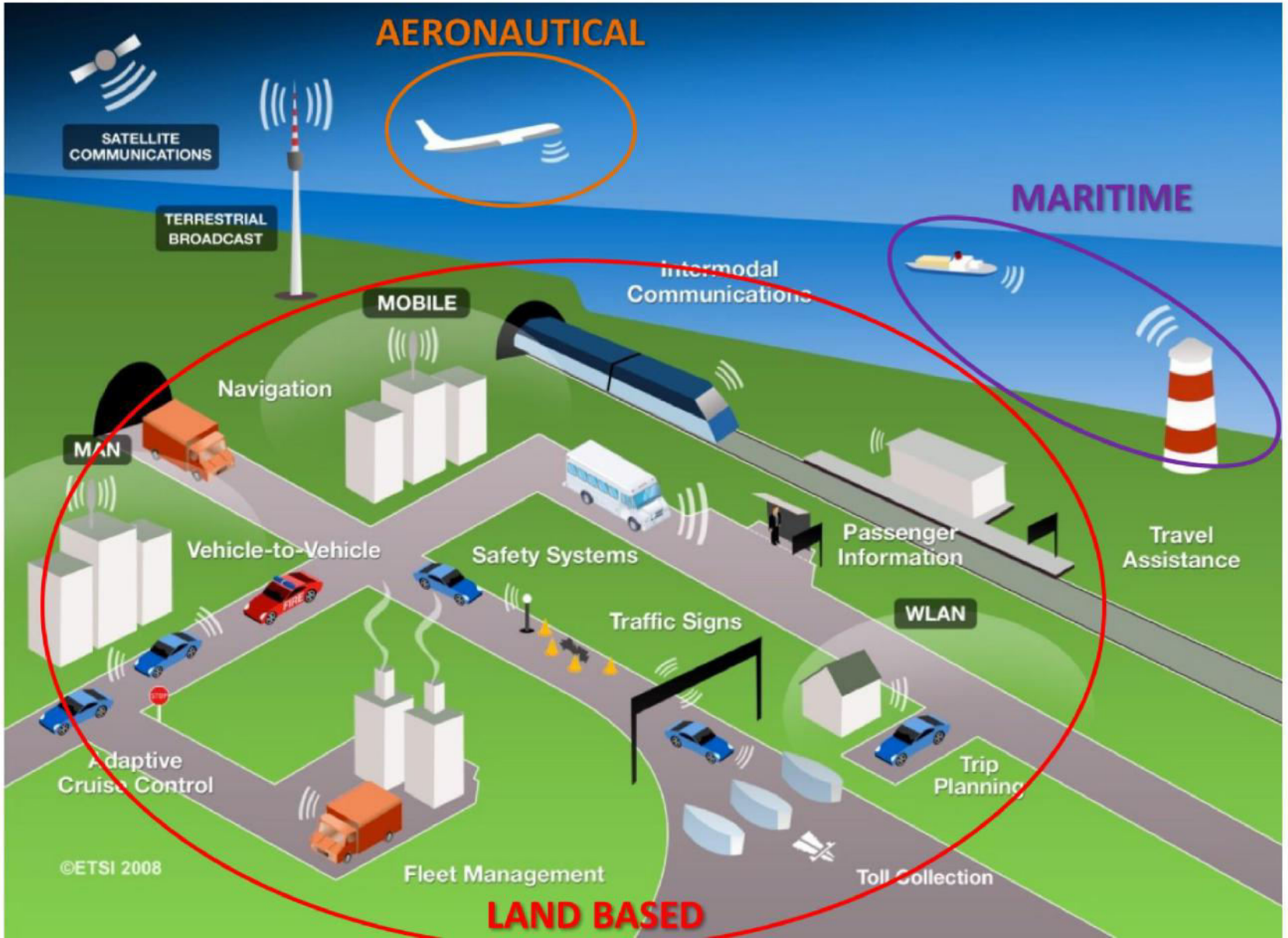
TRA هيئة تنظيم الاتصالات
TELECOMMUNICATIONS REGULATORY AUTHORITY

United Arab Emirates

Radio Spectrum for Future Mobility

@THEUAETRA
www.tra.gov.ae

Intelligent transportation systems need spectrum



TRA | Regulations

- Current Regulations covers part of ITS aspects:
  - Maritime
  - Aeronautical
- TRA future Regulations for Intelligent Transportation System

Connected | Cars

Communication

4G LTE / 5G	800, 1800, 2.6	Data, Voice

In Dash Infotainment

AM, FM	HF, VHF	Radio
DVBT2	470-690 MHz	Video
DAB+	VHF	Radio

Navigation

GPS	L Band	Navigation

Short range Devices

Bluetooth	2.4 GHz	Hands free
Keyless	315, 433 MHz	Remote
Salik / Toll	868 MHz	Toll Tag
Radar	24, 76 & 86 GHz	Sensors
Infrared	Above 300 GHz	Night vision

RAILtransportation

ETIHAD RAILWAYS
GSM-R

Dubai Metro

Al Sufouh
Tram

Abu Dhabi
Light Transit / Tram

Masdar
Rapid Transit System

On board | aircraft

الإتحاد ETIHAD Emirates

Automatic IdentificationSystem (AIS)

Global Maritime Distress & Safety System (GMDSS)

VesselManagement

Maritime

Port Control

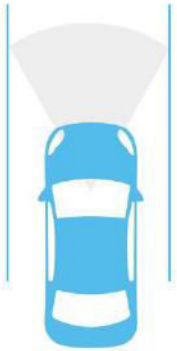
Coastal Stations

Buoys

ICTs | in a car

Estimating
braking
performance

Sensing
the position
of other vehicles
sensing obstacles

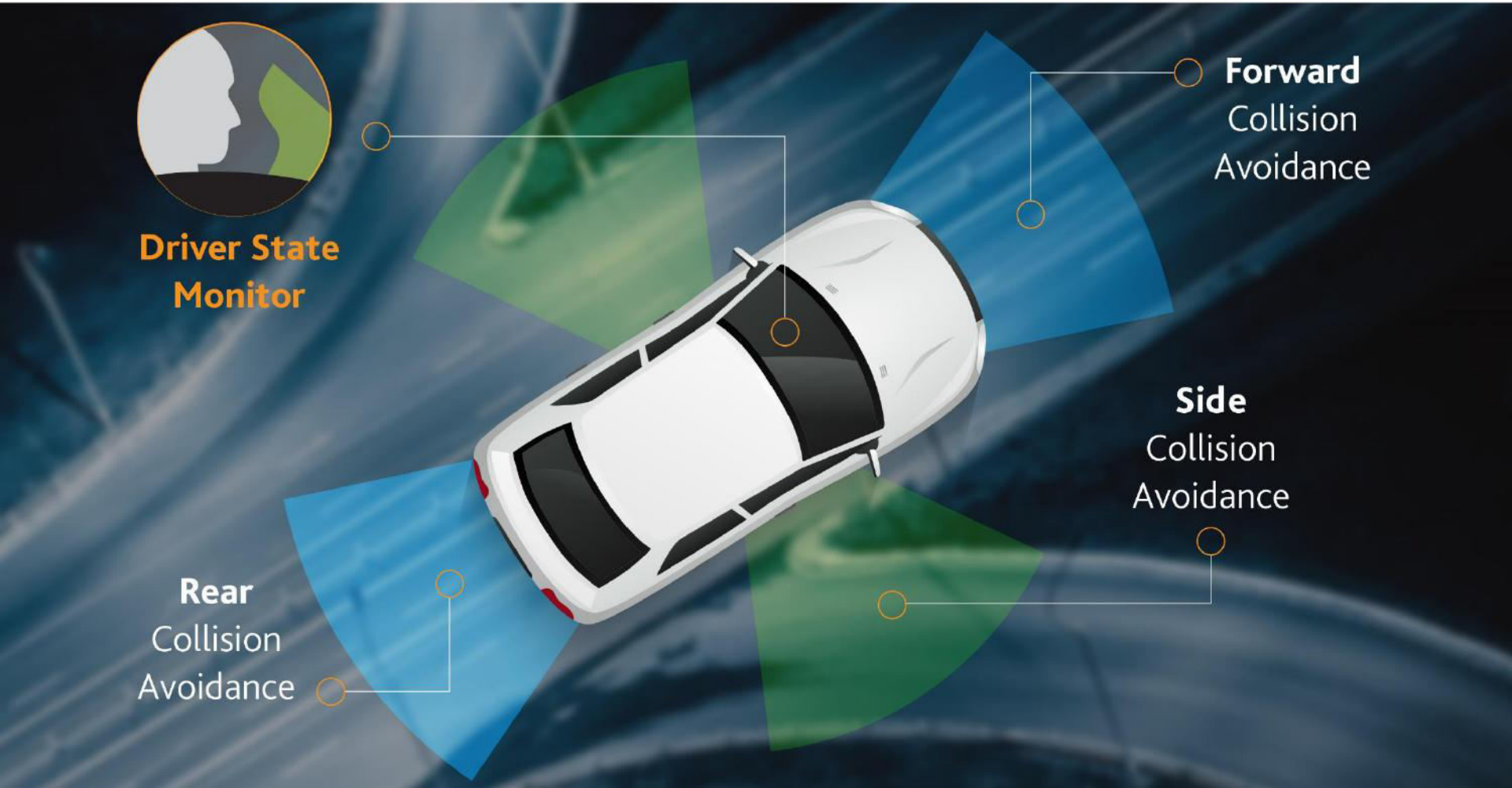


Sensing
the position
of the lane relative
to your own vehicle

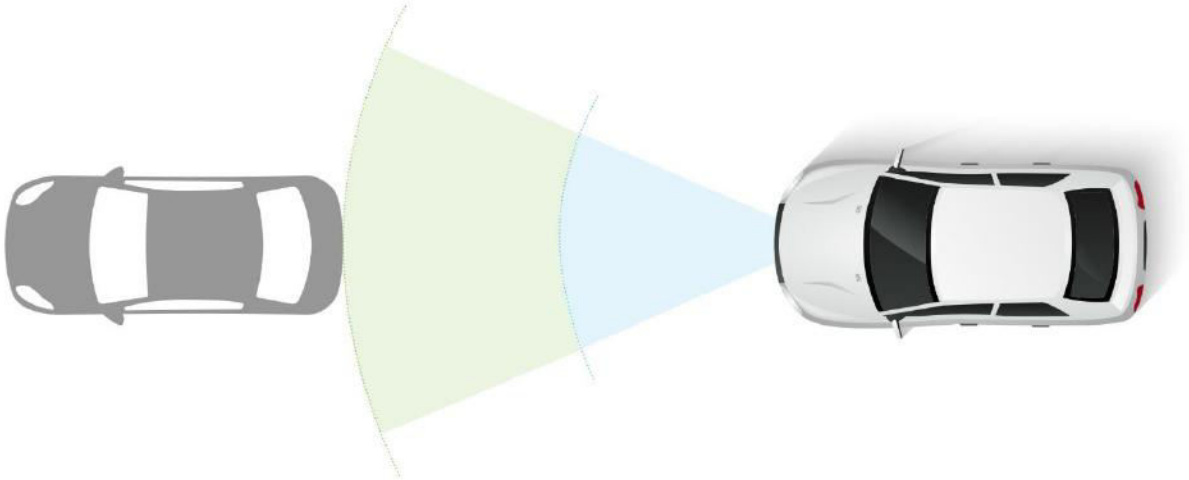
Navigation

- sensing vehicle position and motion
- communication
- RFID
- sensor-friendly vehicles and roadways

Active safety systems in car using | ICT



Adaptive | Cruise Control



- Adaptive Cruise Control (ACC) is a cruise control system, but can also help maintain the gap to the vehicle ahead by operating the throttle and brake systems. **ACC contains a radar** to measure the gap and closing speed to the vehicle ahead.

- Features such as Forward Collision Warning and Collision Mitigation by Braking also use a **radar.**

Advanced

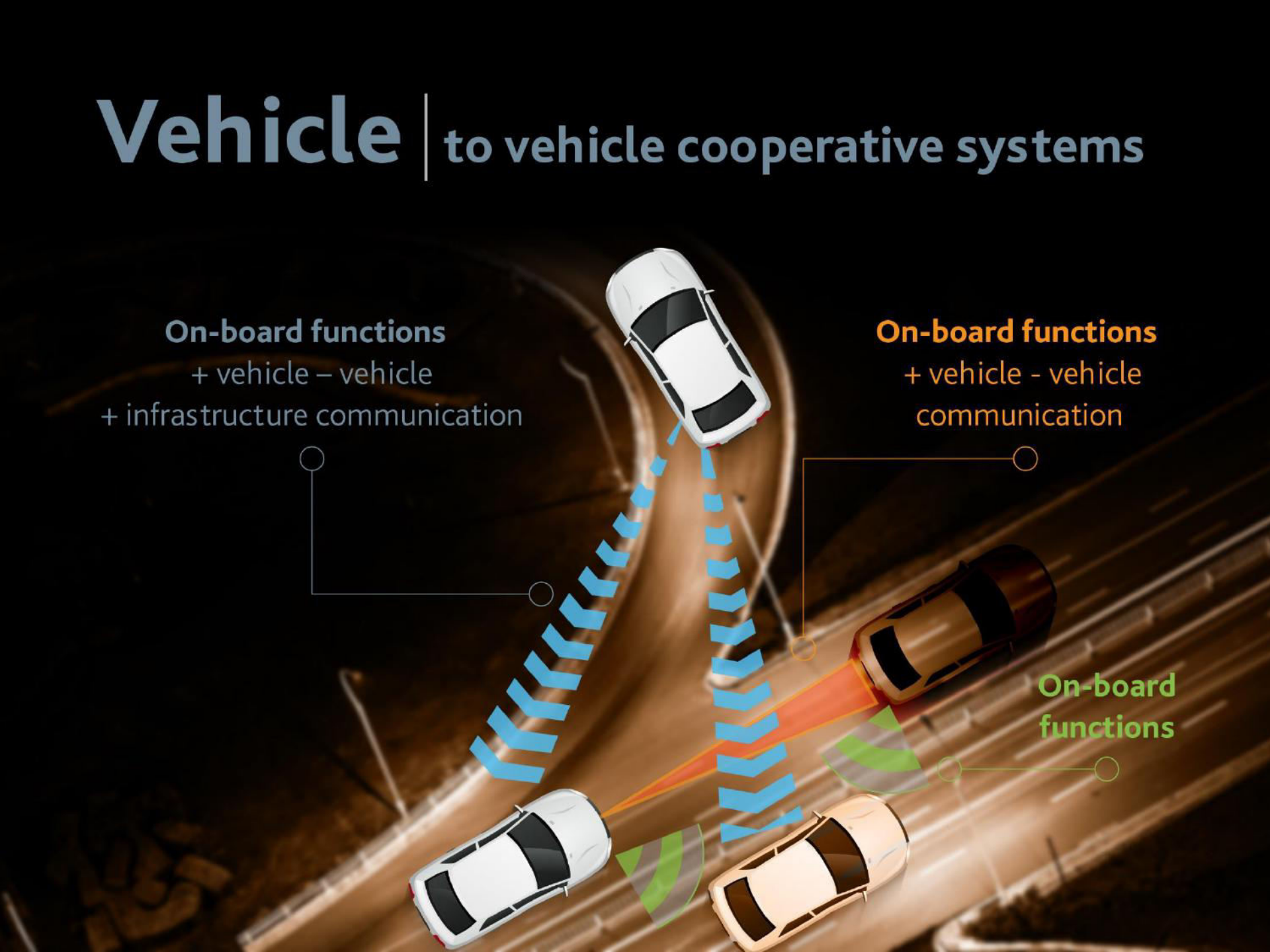
Driver Assistance Systems

- Blind-Spot monitoring system is now available on some cars.
- Lane departure warning system is also available on some cars.
- Collision Mitigation by Braking with automatic braking, for both moving and stopped vehicles.
- Wider field-of-view radar that will monitor multiple traffic lanes.
- Parking assistance.

Improving | Road Safety

- Collision avoidance radar can be used for lateral control with modified lane-marking tape.
- Frequency-dependent tape properties can provide distance and other information.
- Conventional lane marking tape (3M Corp.) punched with specific hole pattern to provide frequency-selective retro-reflection

Vehicle | to vehicle cooperative systems

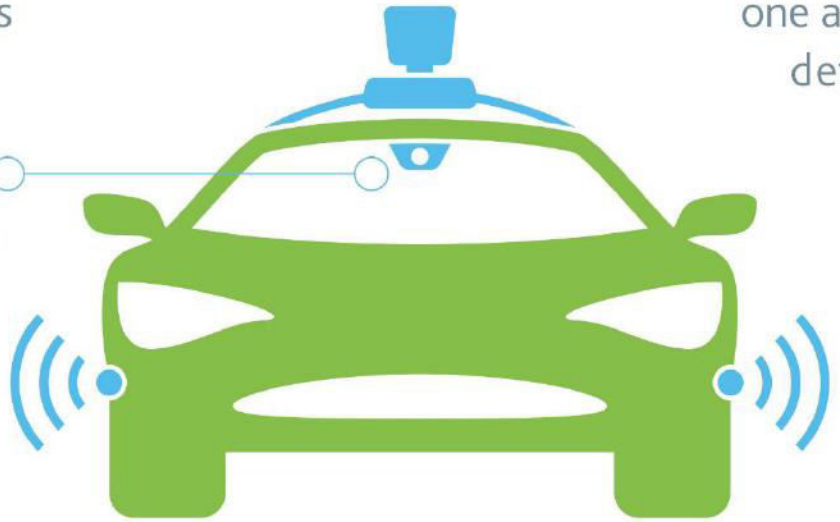


Intelligent | driverless cars

Rotating sensor on roof generates 3D map of surroundings

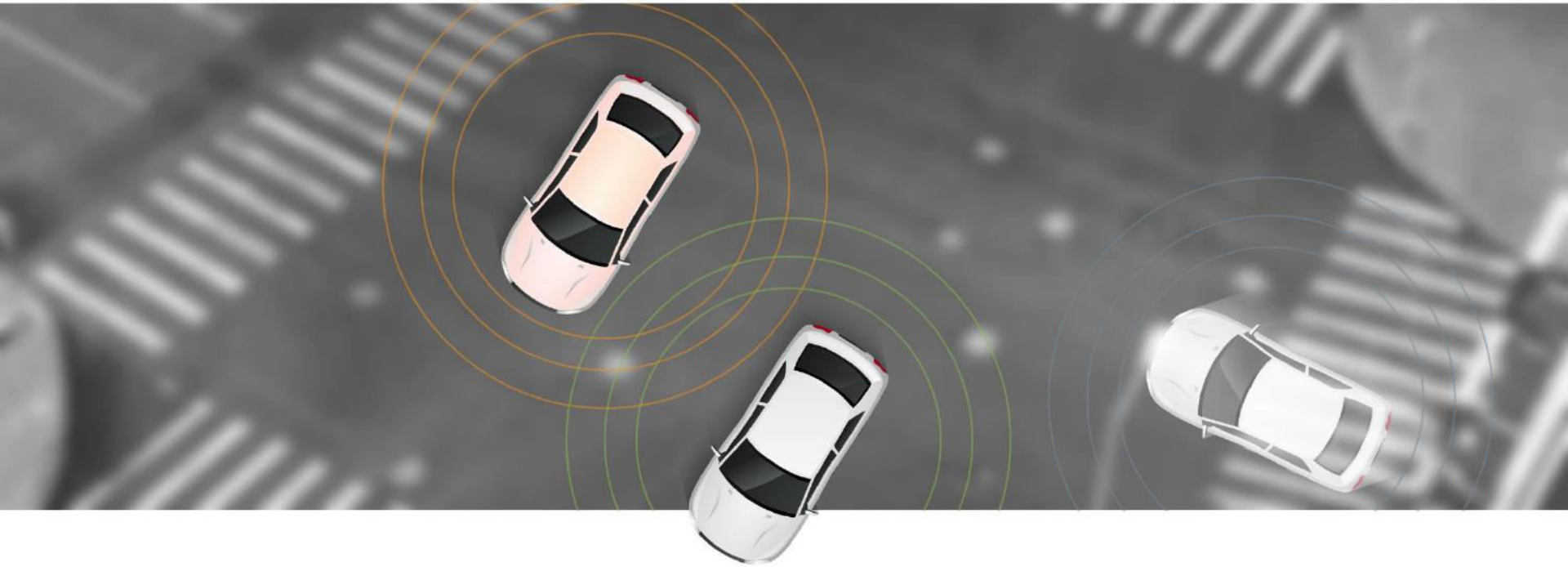
Video camera on windscreen detects traffic lights and moving traffic

Radar sensors - three at the front and one at the back - help determine position



Tow people in car - driver to take over in an emergency and engineer to monitor sotware

Intelligent Cars | Could Boost Highway Capacity by 273%



Tue, September 04, 2012 IEEE Spectrum Inside Technology

Highway Capacity Benefits from Using Vehicle-to-Vehicle Communication and Sensors for Collision Avoidance, by Patcharinee Tientrakool, Ya-Chi Ho, and Nicholas F. Maxemchuk from Columbia University, was presented last year at the IEEE Vehicular Technology Conference.