interactIVe

Accident avoidance by active intervention for Intelligent Vehicles

www.interactIVe-ip.eu

interactIVe – Challenges

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Project overview: Facts

- Budget: EUR 30 Million
- European Commission: EUR 17 Million

- Duration: 42 months (January 2010 – June 2013)

- Coordinator: Aria Etemad, Ford Research and Advanced Engineering Europe

- 10 Countries: Czech Republic, Finland, France, Germany, Greece, Italy, Spain, Sweden, The Netherlands, UK

European Commission
Information Society and Media

EUCAR
EUROPEAN COUNCIL FOR AUTOMOTIVE R&D

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Consortium

- OEMs

- Suppliers

- Research

- SMEs

Mission

The interactIVe vision:
Accident-free traffic and active safety systems in all vehicles.

- **Overcome the obstacle of independent functions and high system costs:**
  - Integrated solutions
  - Affordable systems

- **Consider all vehicle classes:**
  - Build up seven demonstrator vehicles: six passenger cars & one truck
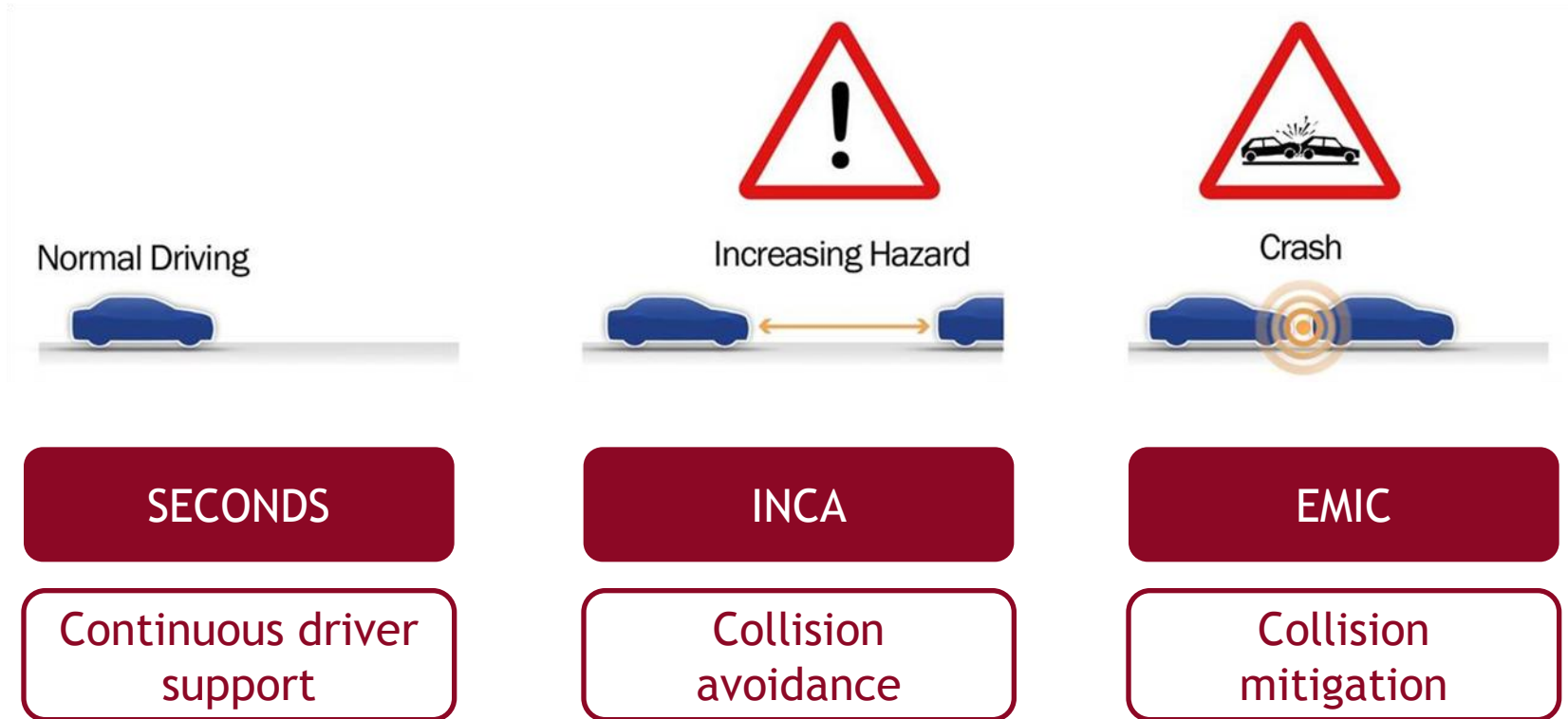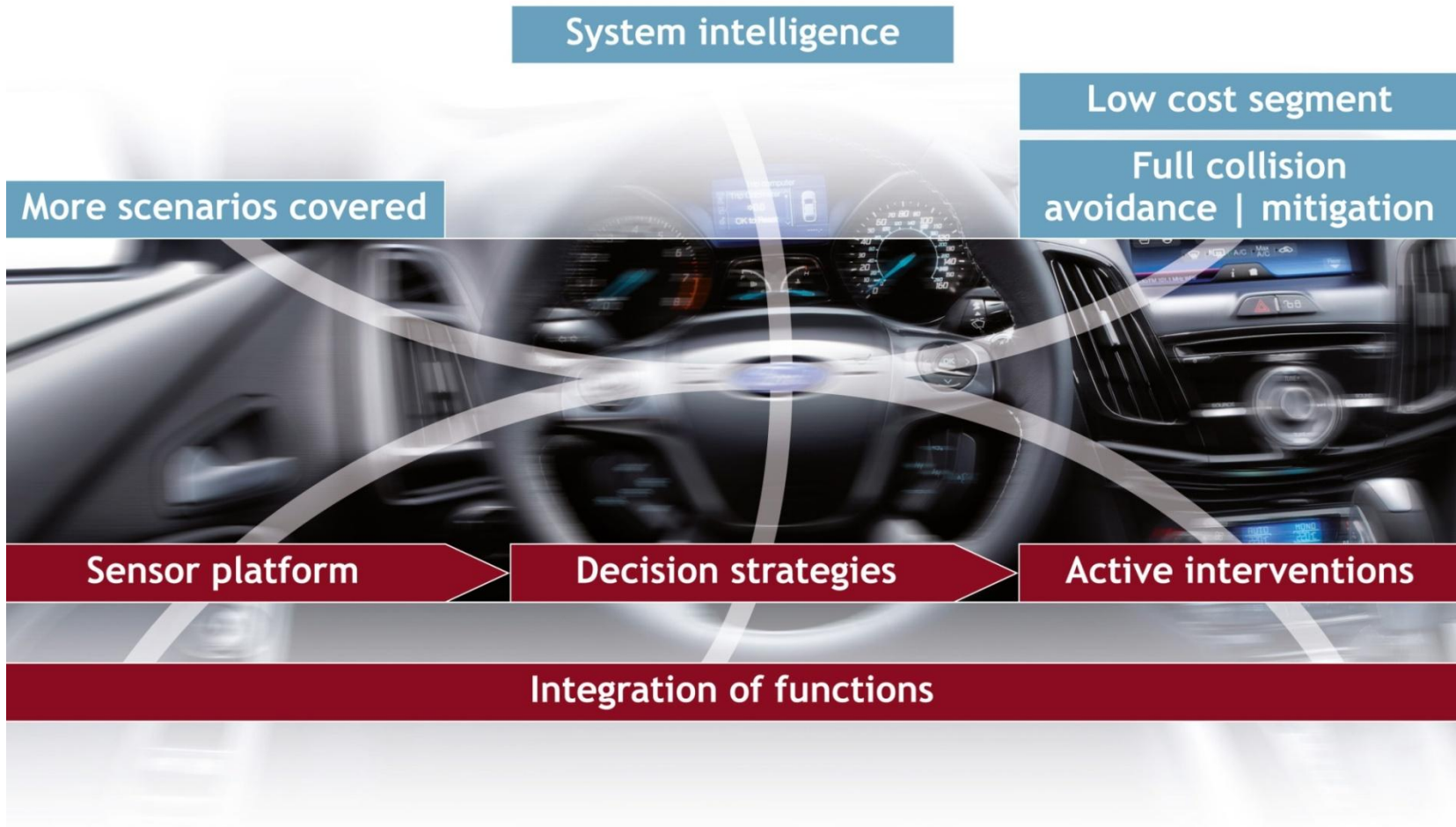
Causes of accidents

Human Error > 90%

Others
(e.g. surroundings, weather, …)

Source: GIDAS Database

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Research concept

Normal Driving

Increasing Hazard

Crash

SECONDS

INCA

EMIC

Continuous driver support

Collision avoidance

Collision mitigation

Objectives

System intelligence

Low cost segment

Full collision avoidance | mitigation

More scenarios covered

Sensor platform → Decision strategies → Active interventions

Integration of functions

Project structure

Sub-project 1: **Integrated project (IP) management**

Integrated advanced driver assistance systems (ADAS) for continuous support and emergency intervention

Sub-project 2: **Perception**
Specifications for sensor interfaces and fusion modules

Sub-project 3: **Information, warning and intervention (IWI) strategies**
Definition of use cases and requirements | Specifications for IWI strategies

Sub-project 4: **SECONDS**
Safety enhancement through continuous driver support

Sub-project 5: **INCA**
Integrated collision avoidance and vehicle path control

Sub-project 6: **EMIC**
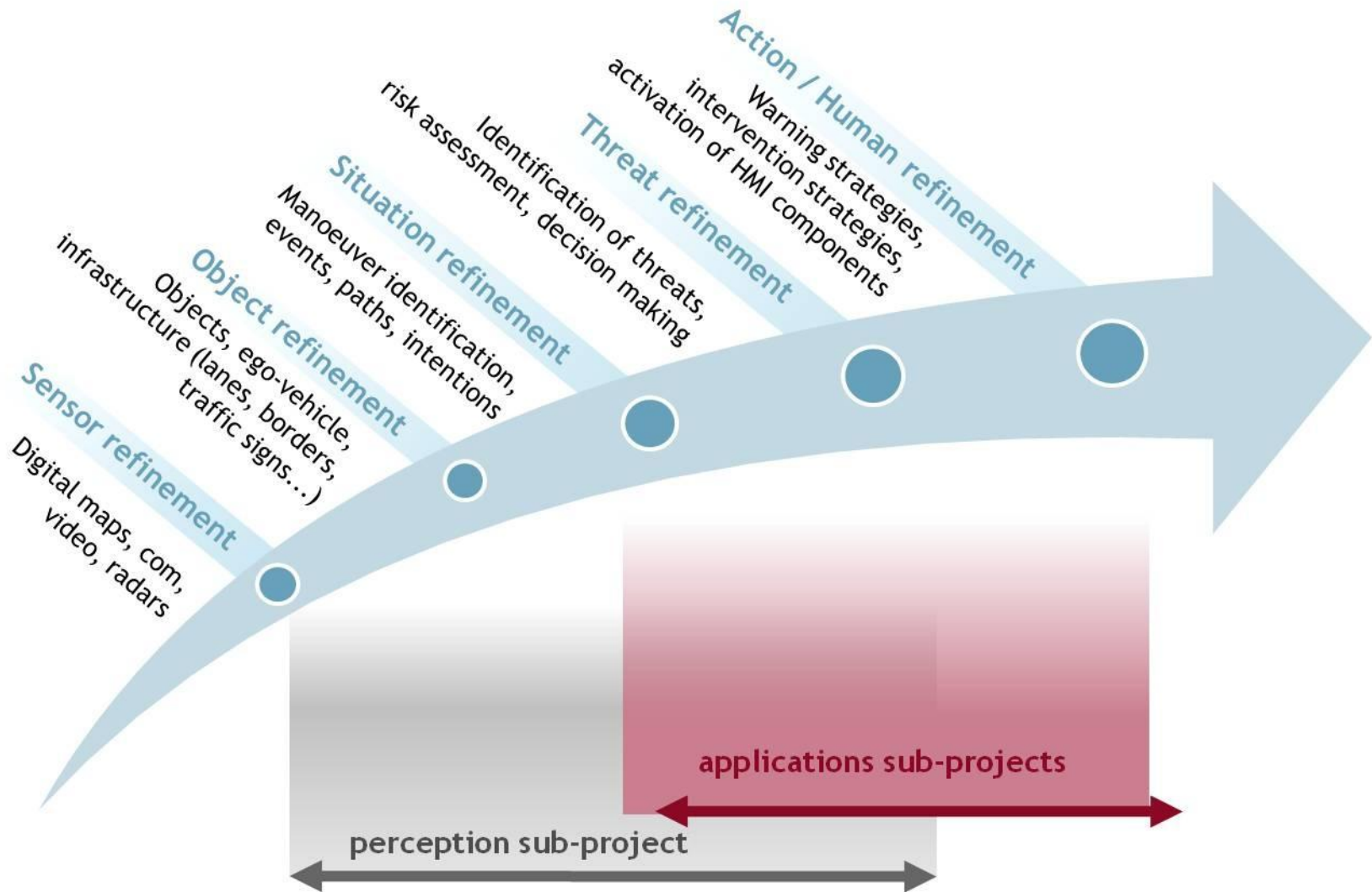Cost-efficient emergency intervention for collision mitigation

Seven demonstrator vehicles: six passenger cars and one truck

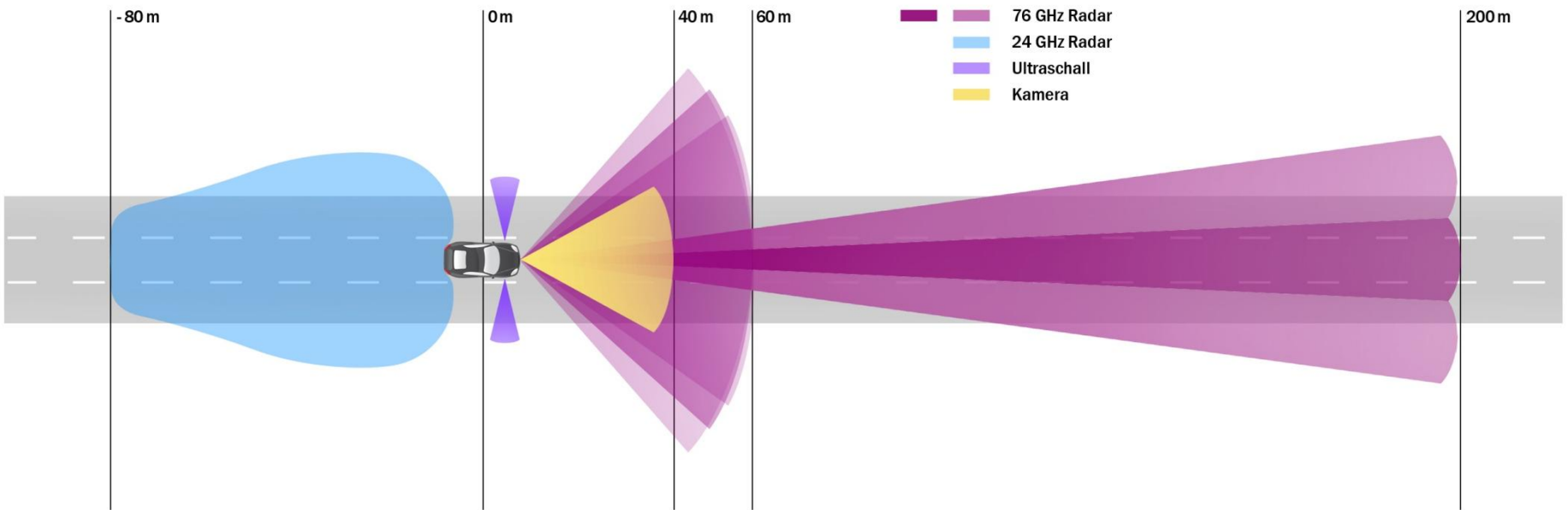Sub-project 7: **Evaluation and legal aspects**
Test and evaluation framework for interactIVe applications | Analysis of legal aspects
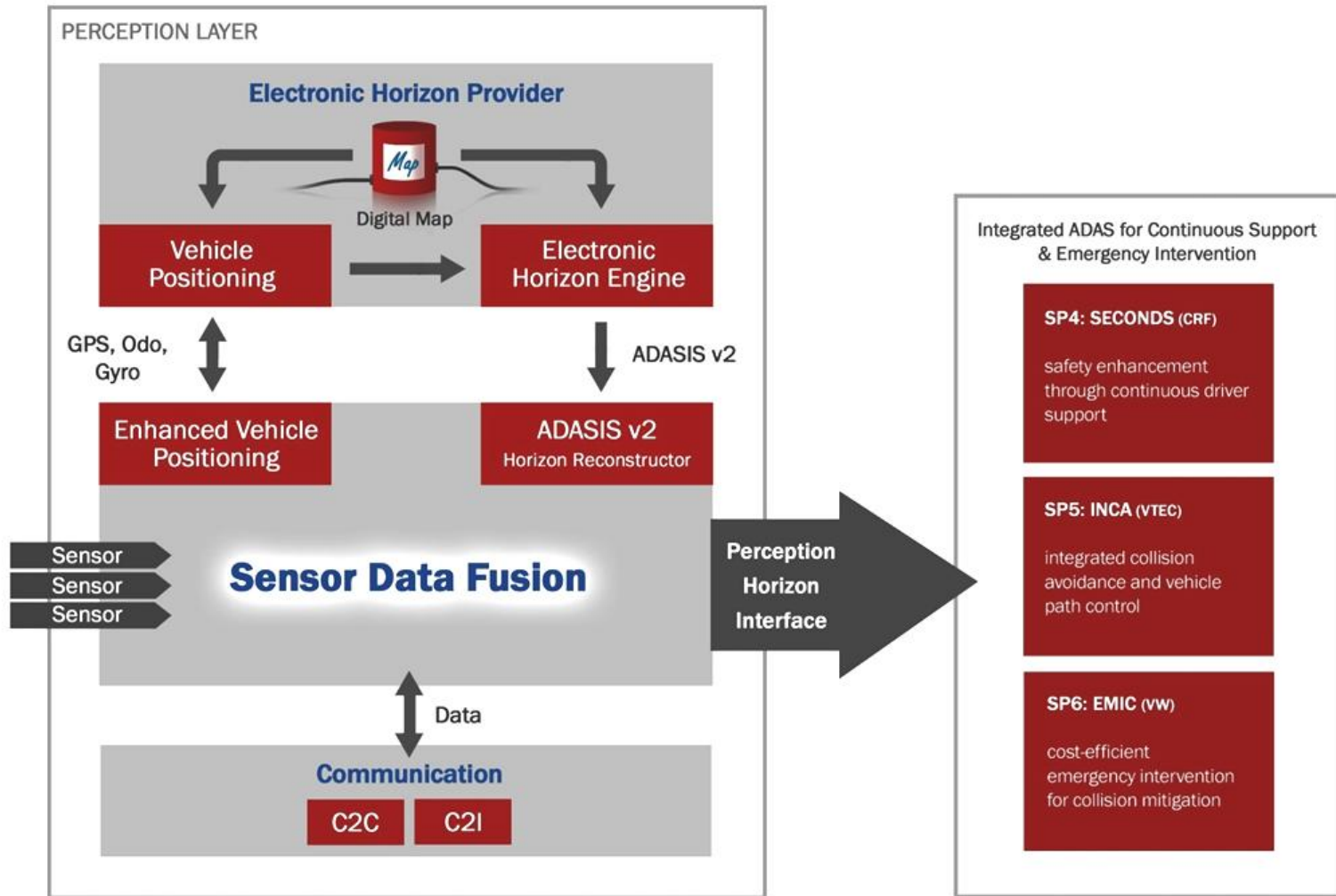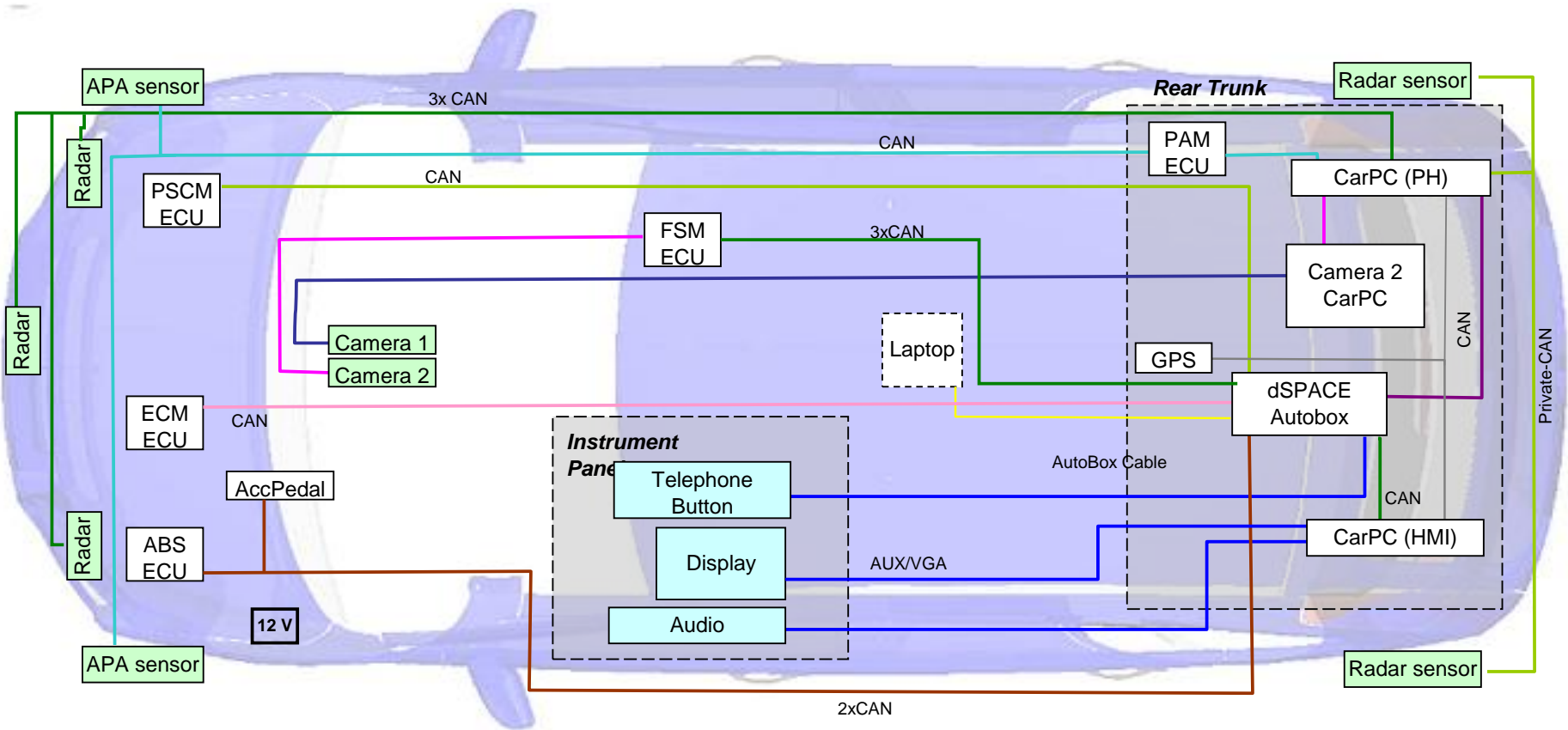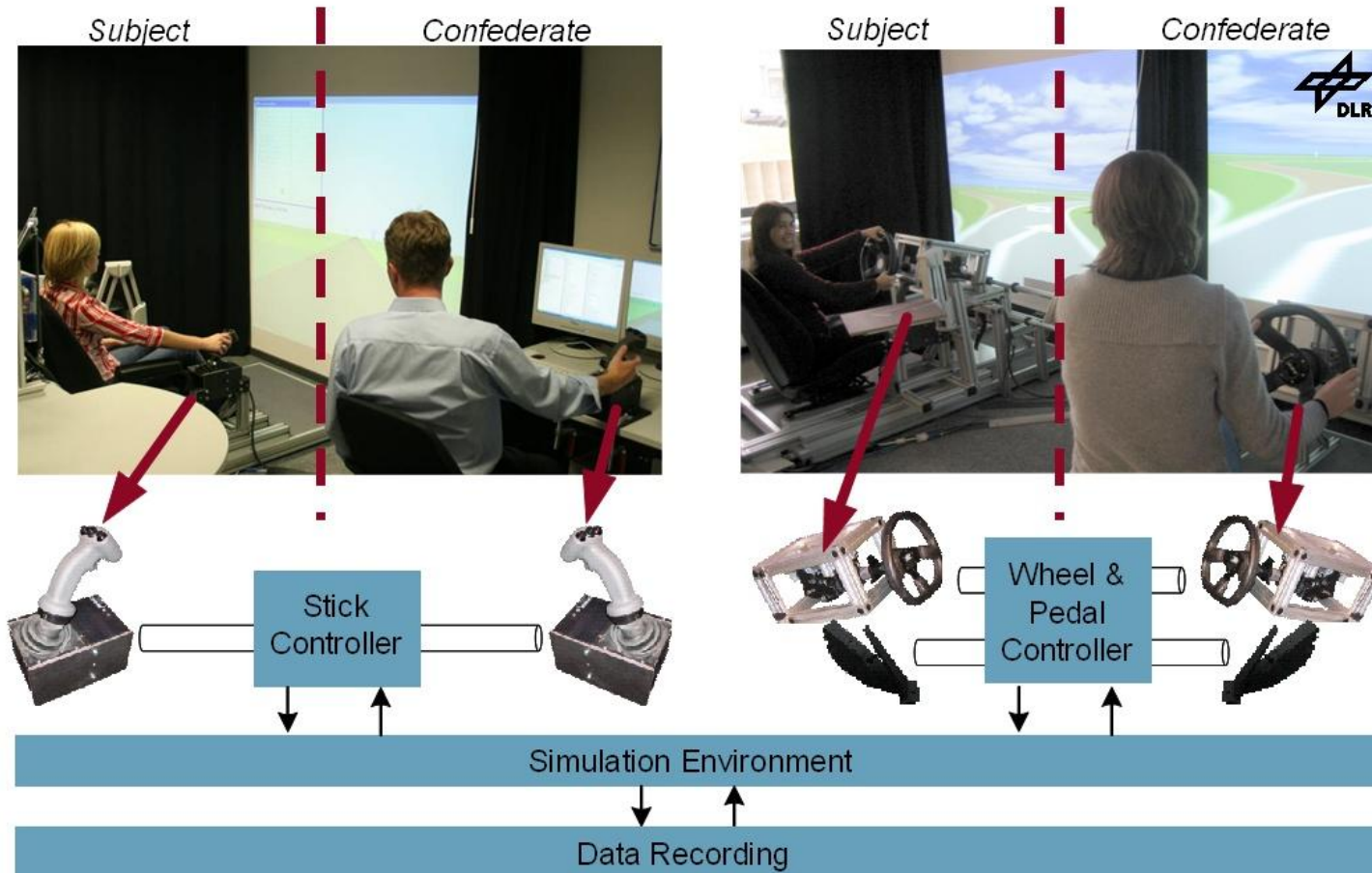
Perception: sensor fusion process

Sensor concept

- 80 m | 0 m | 40 m | 60 m | 200 m

76 GHz Radar
24 GHz Radar
Ultraschall
Kamera

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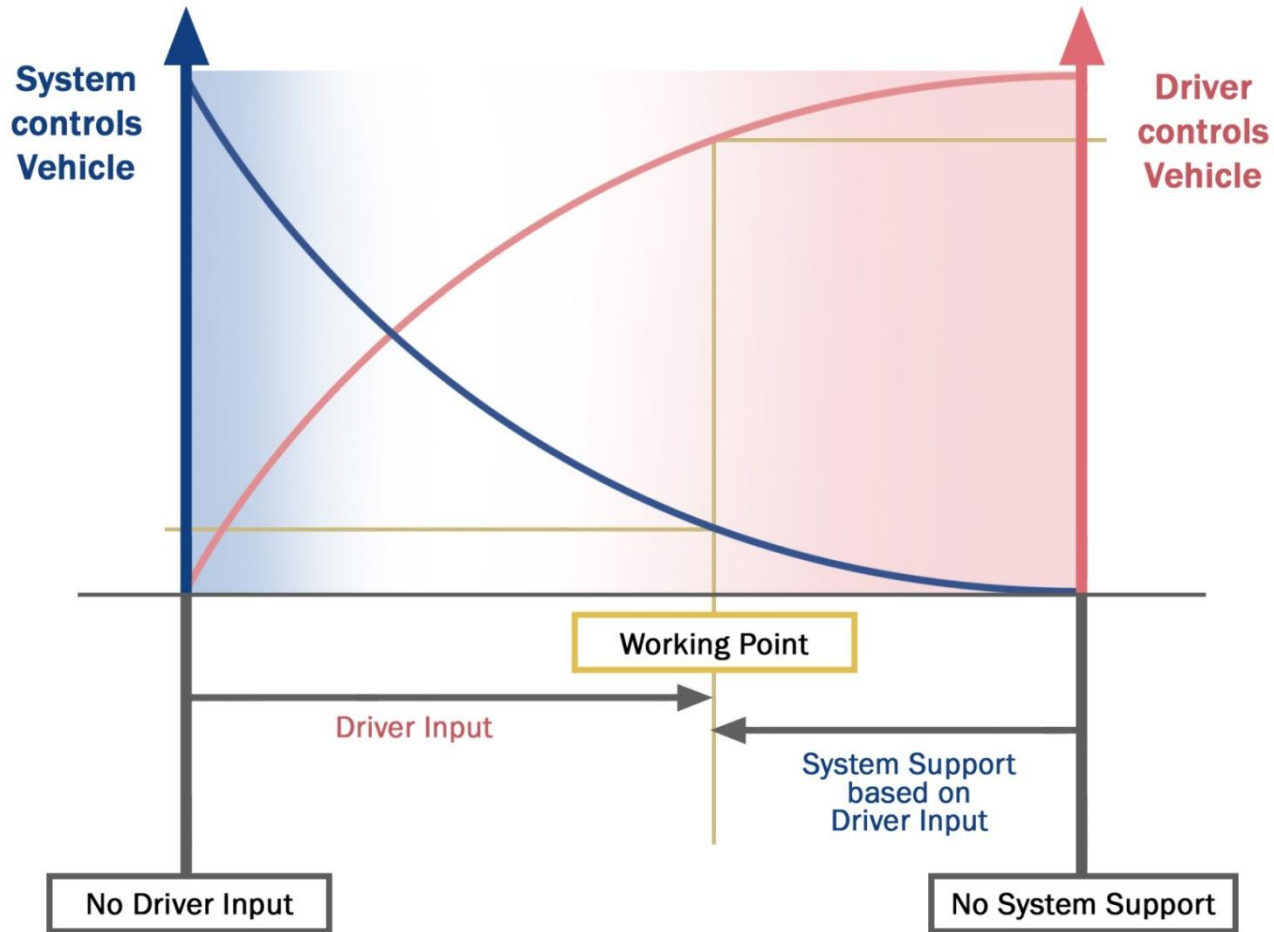# SP2: Perception

System architecture

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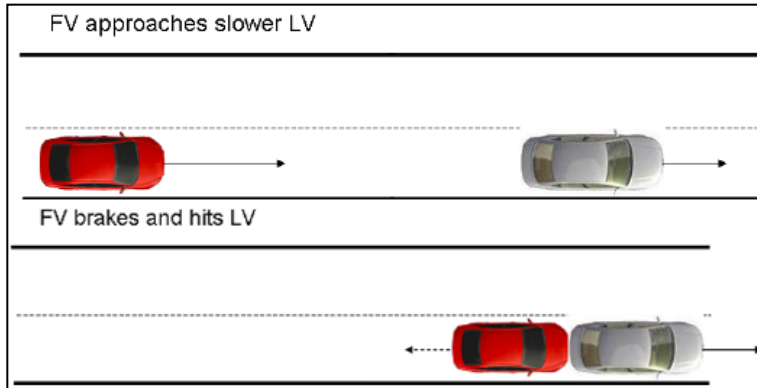# IWI strategies: theatre technique
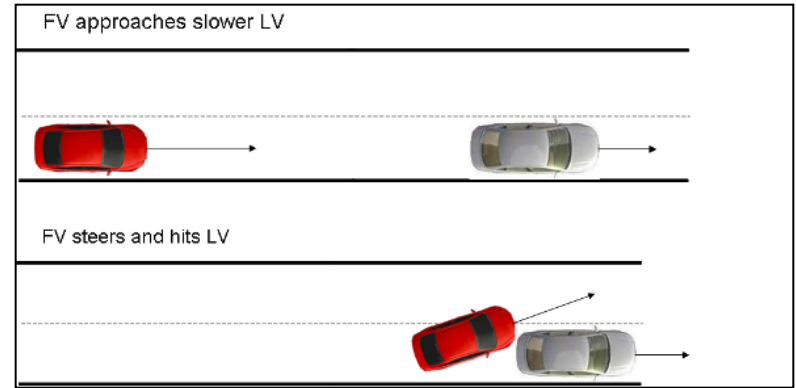
Support: splitting driving task between driver and vehicle

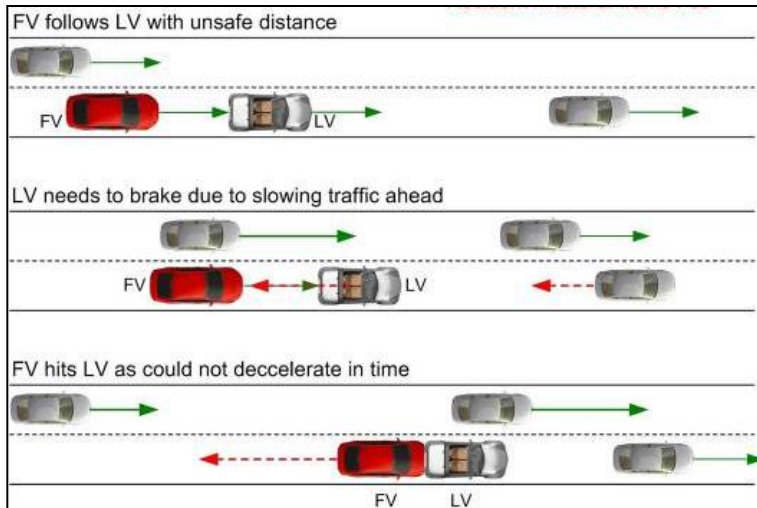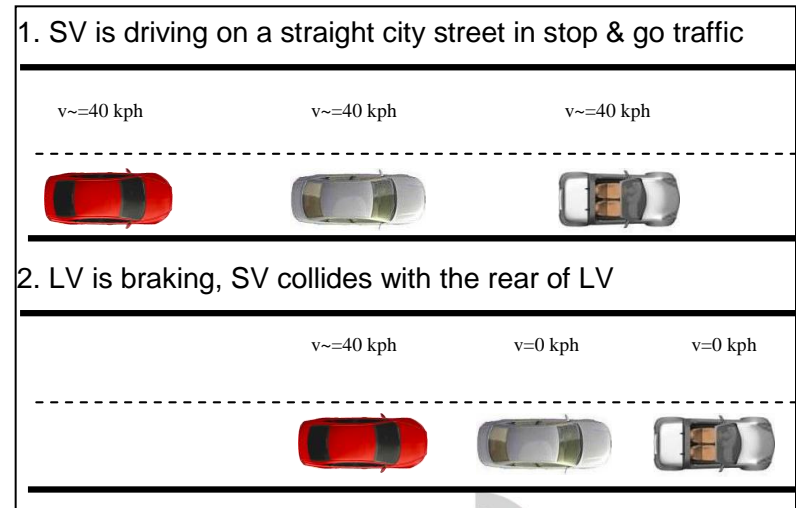# Accident scenarios: Rear End Collision Avoidance (RECA)

- Late reaction - Braking

FV approaches slower LV

FV brakes and hits LV

- Late reaction - Steering

FV approaches slower LV

FV steers and hits LV

- Unsafe distance

FV follows LV with unsafe distance

FV   LV

LV needs to brake due to slowing traffic ahead

FV   LV

FV hits LV as could not deccelerate in time

FV   LV

- No reaction

1. SV is driving on a straight city street in stop & go traffic

v~=40 kph   v~=40 kph   v~=40 kph

2. LV is braking, SV collides with the rear of LV

v~=40 kph   v=0 kph   v=0 kph

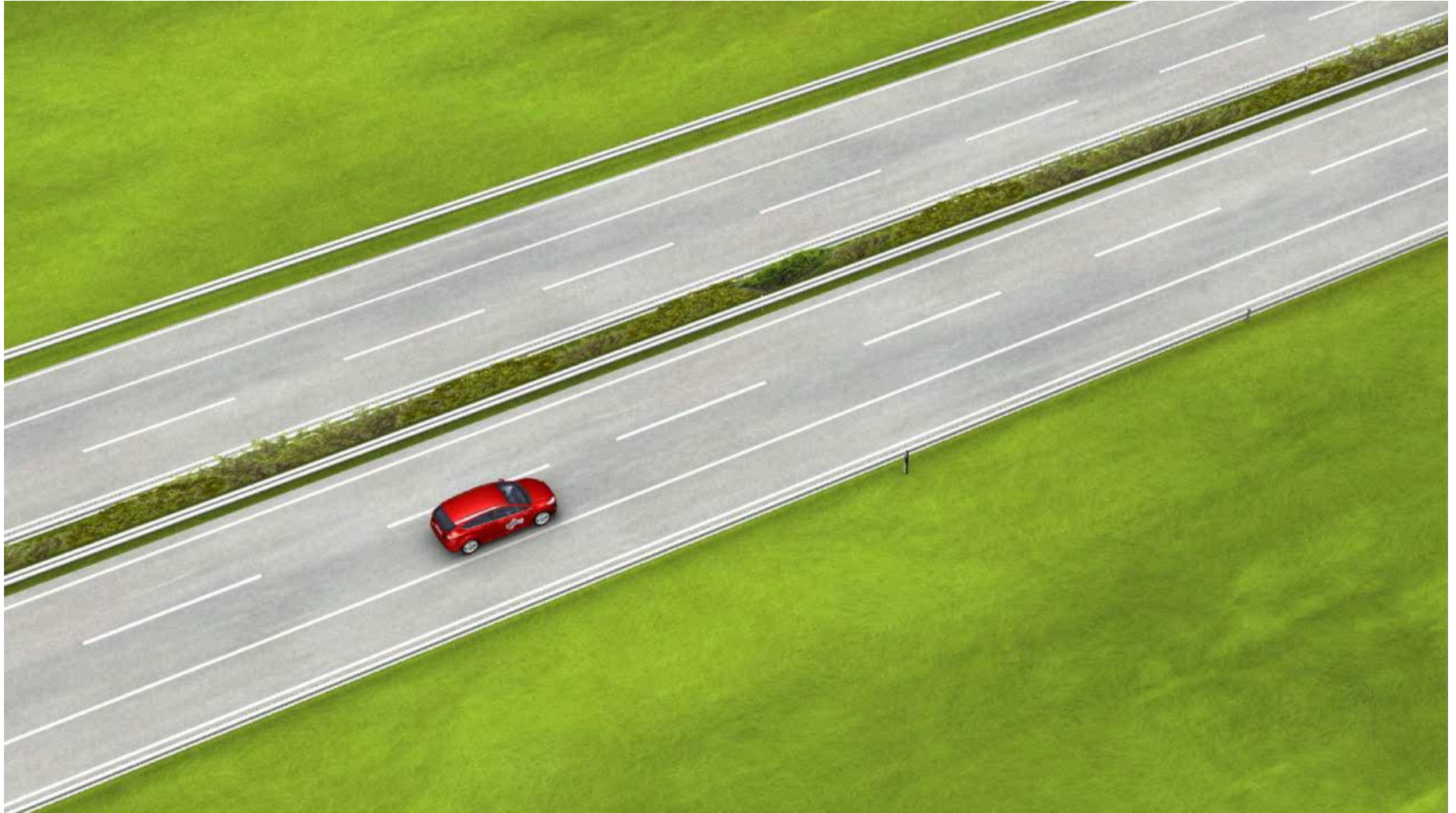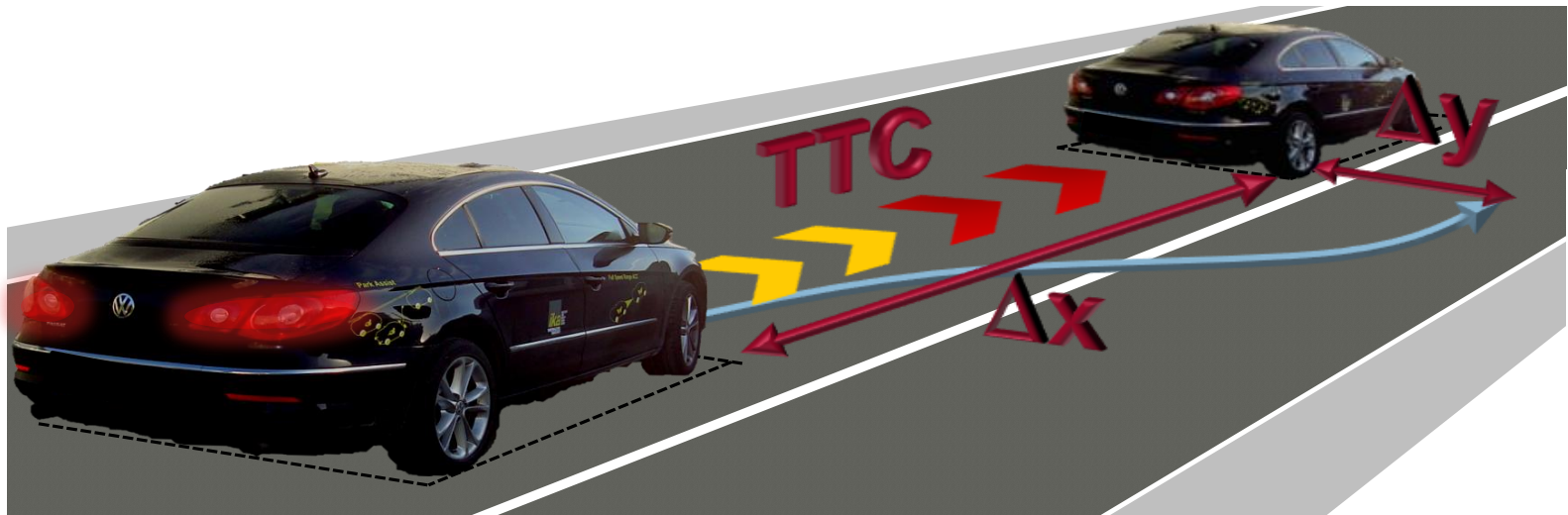interactive

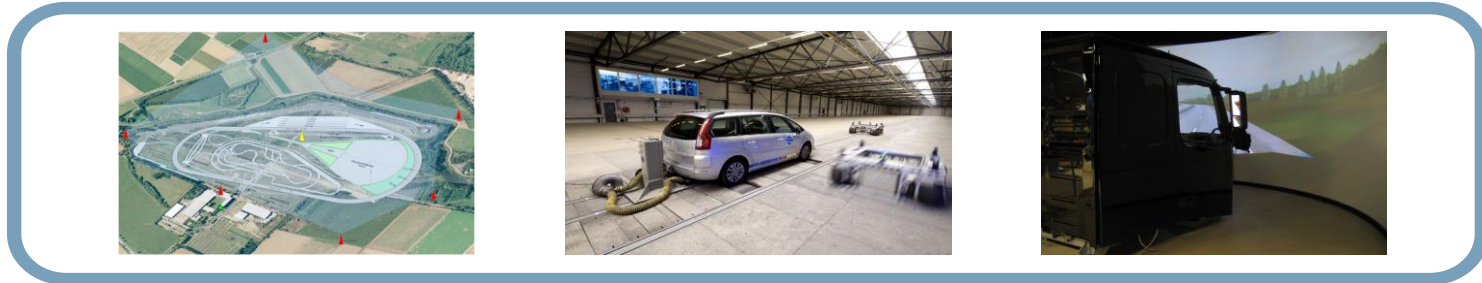# Flow diagram: critical situations RECA
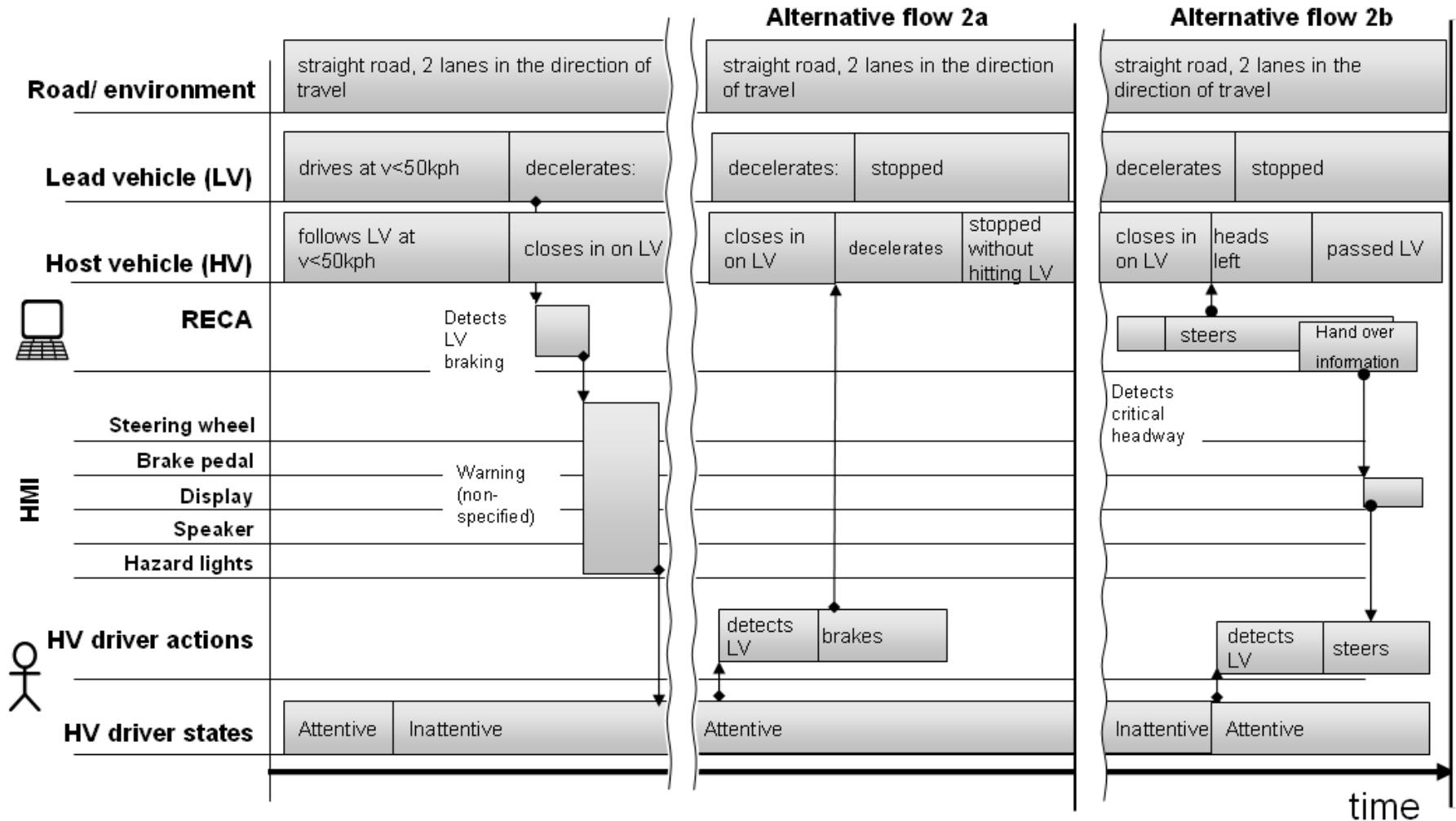
Rear End Collision Avoidance (RECA)

Evaluation and legal aspects

Seven demonstrator vehicles

SECONDS

INCA

EMIC

BMW — Enhanced dynamic pass predictor

Fiat — Continuous support with focus on haptic HMI solutions

Volvo car — Collision avoidance, continuous support and SafeCruise

Ford — Collision avoidance, continuous haptic support and automated driving

Volvo truck — Collision avoidance and run-off road prevention by braking and steering, stability considerations for heavy vehicles
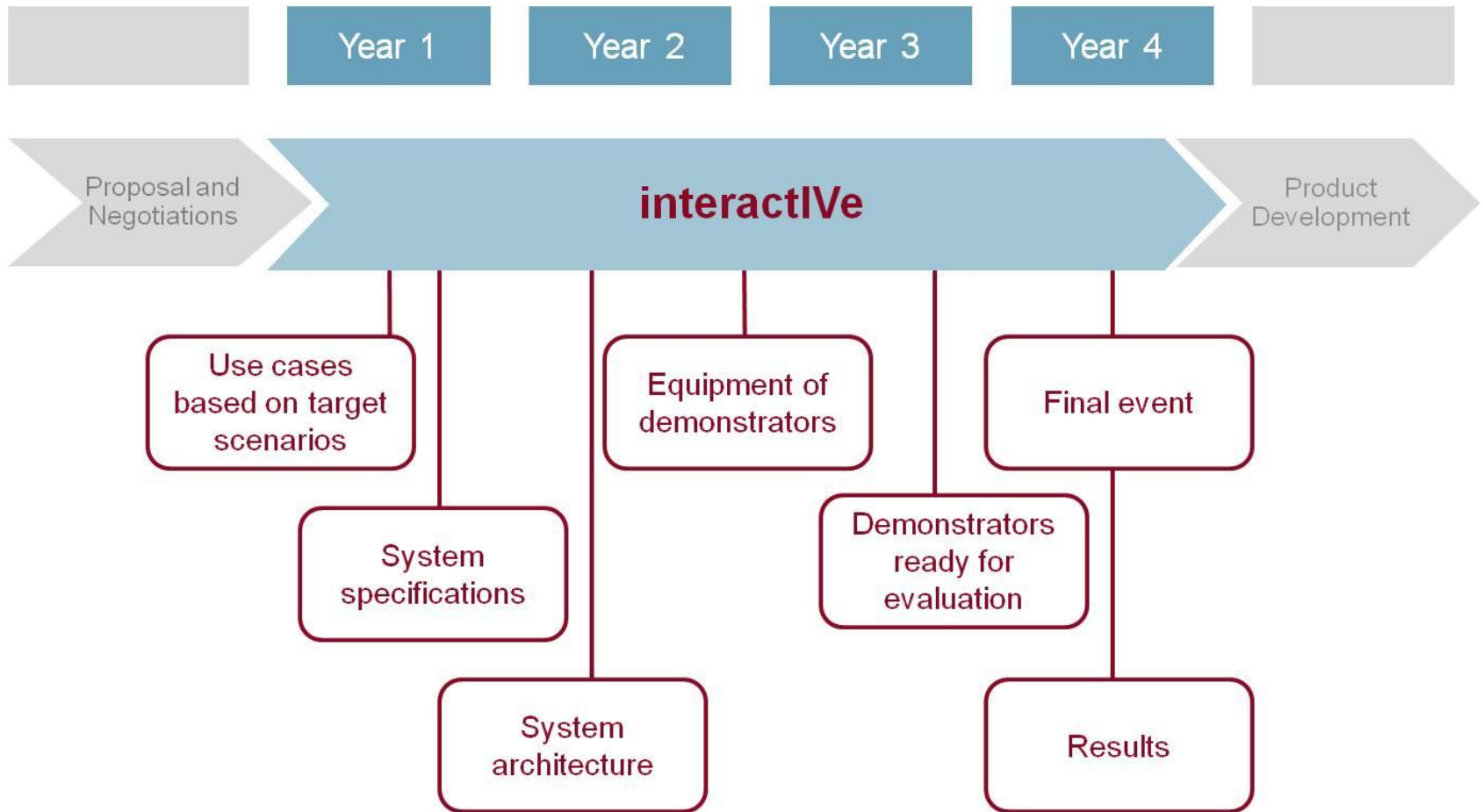
VW — Collision mitigation with focus on cost-efficient sensors and algorithm approach

Conti — Emergency steering assistance with focus on radar/vision combination

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Timeline

Thank you.

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