

interactive



Accident avoidance by active intervention for Intelligent Vehicles

www.interactIVe-ip.eu

Demonstrator Vehicles

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interactIVe Final Event

20th-21st November 2013

Agenda

- **Overview of interactive demonstrator vehicles**
 - Commonalities
 - Ford
 - Fiat
 - BMW
 - Conti
 - Volvo VCC
 - Volvo truck
 - VW
- **interactive demo in Lommel**

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

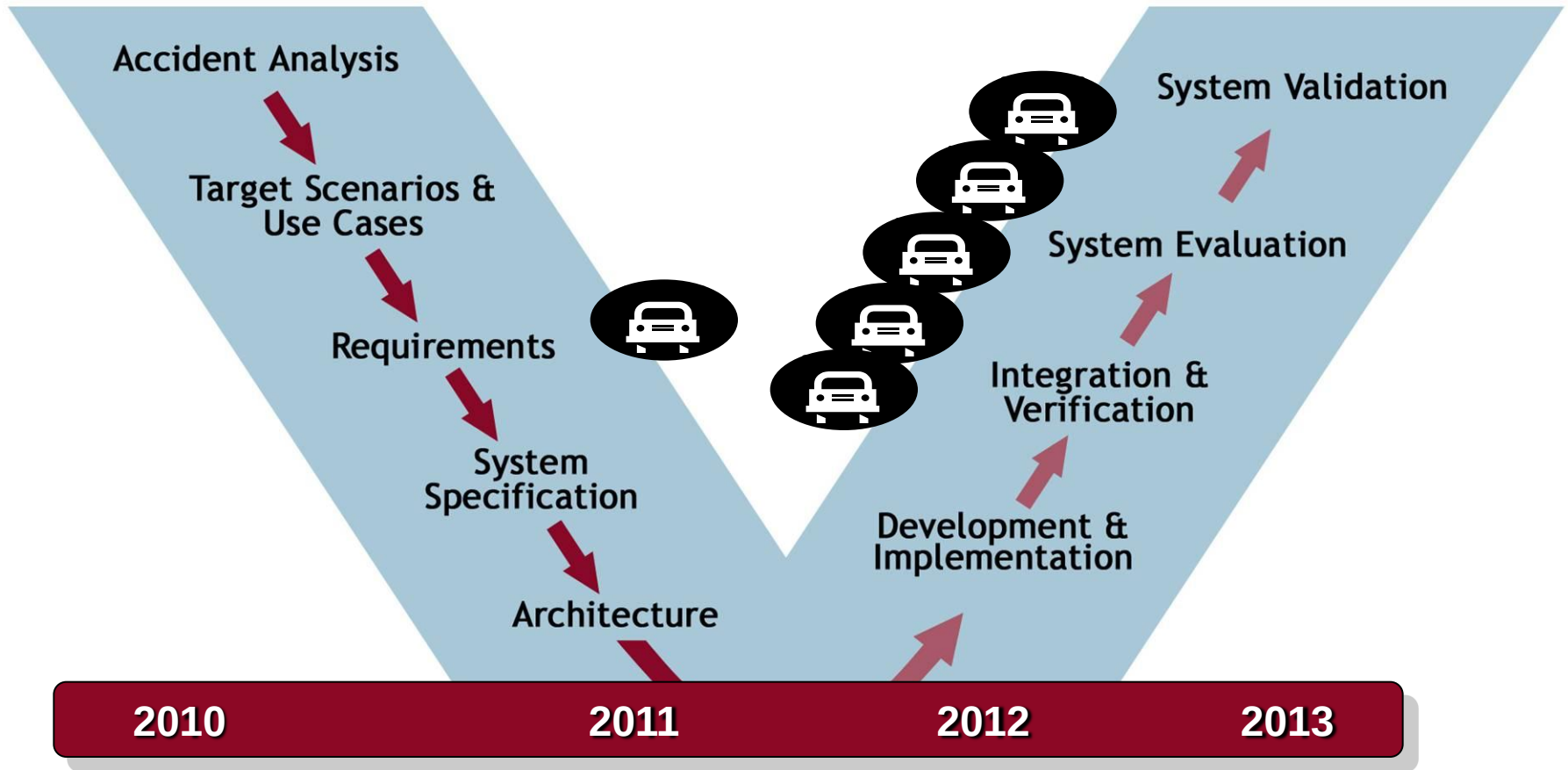
Volvo truck Collision avoidance and run-off road prevention by braking and steering, stability considerations for heavy vehicles

VW Collision mitigation with focus on cost-efficient sensors and algorithm approach

Conti Emergency steering assistance with focus on radar/vision combination

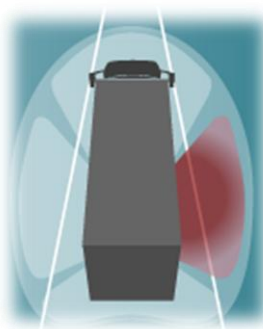


Timeline - Development process – Use of demonstrators

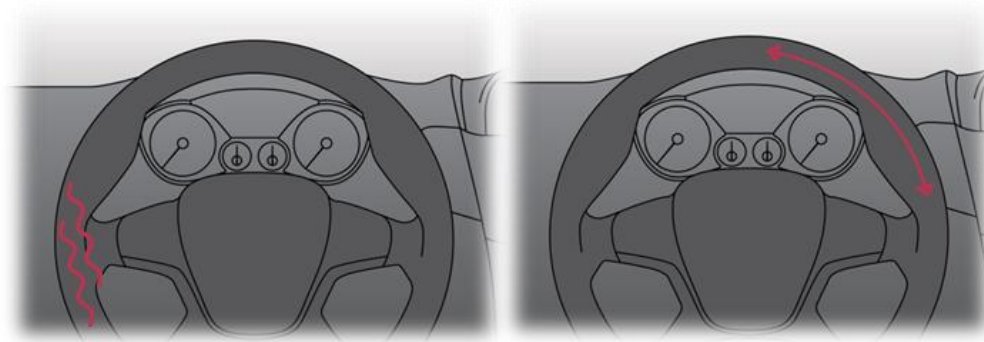


Demonstrator Vehicles: Common design elements

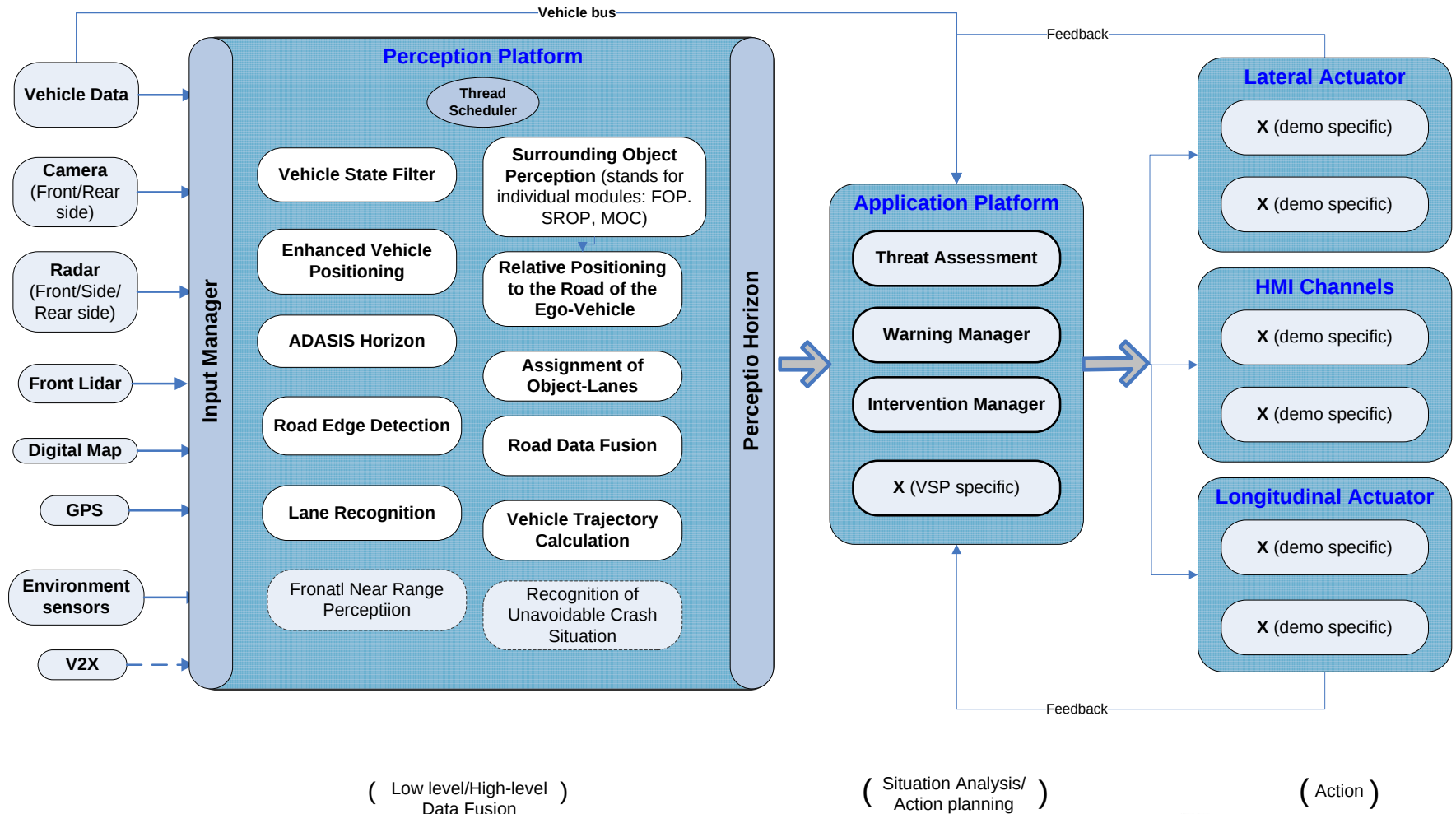
- In addition to common strategies
 - Common **visual** elements developed to indicated system status



- Common **haptic** elements for warning and interventions



Demonstrator Vehicles: Common Functional Architecture



Ford Demonstrator

SECONDS

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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



Ford Demonstrator (Ford Focus)



Longitudinal

- Full range ACC
- Curve Speed Control
- Speed Limit Control
- Curve Speed Warning
- Distance Alert
- Haptic Forward Collision Warning
- Autonomous Braking

Rear End-
Collision Avoidance

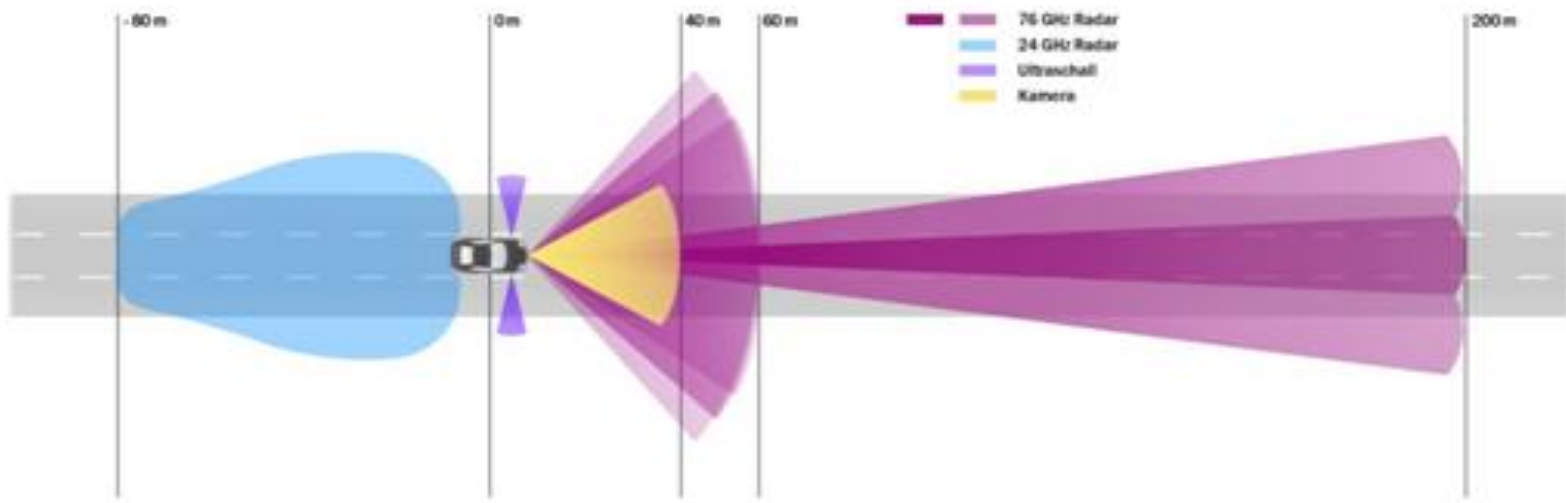
Lateral

- Lane Centering Assist
- Lane Keeping Assist /
Lane Departure Warning
- Side Impact Avoidance
- Lane Change Collision Avoidance
- Rear End Collision Avoidance
- Run-Off Road Prevention

Ford Demonstrator - Sensors



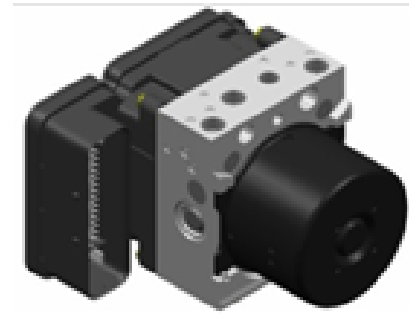
- 76 GHz long range radar
- Three additional front radars
- Two cameras
- Ultrasonic sensors (left + right side)
- Two rear radars (24 GHz)



Ford Demonstrator - Actuators

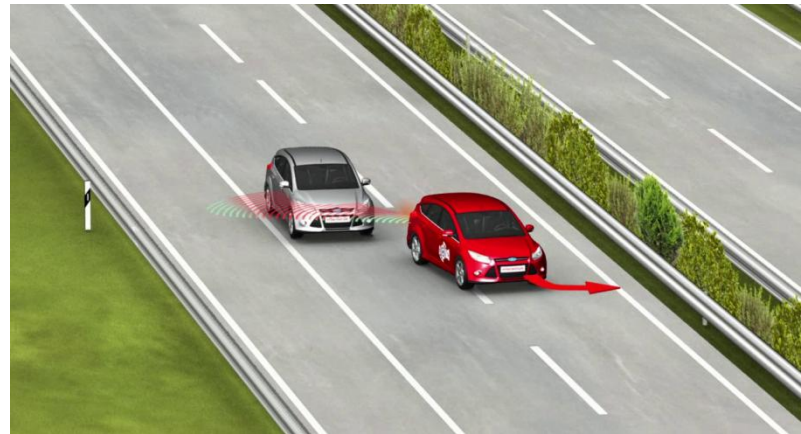


- Steering system replaced and SW adapted to accept steering torque requests from AutoBox.
- Brake system interface adapted for request of individual wheel brake pressure.

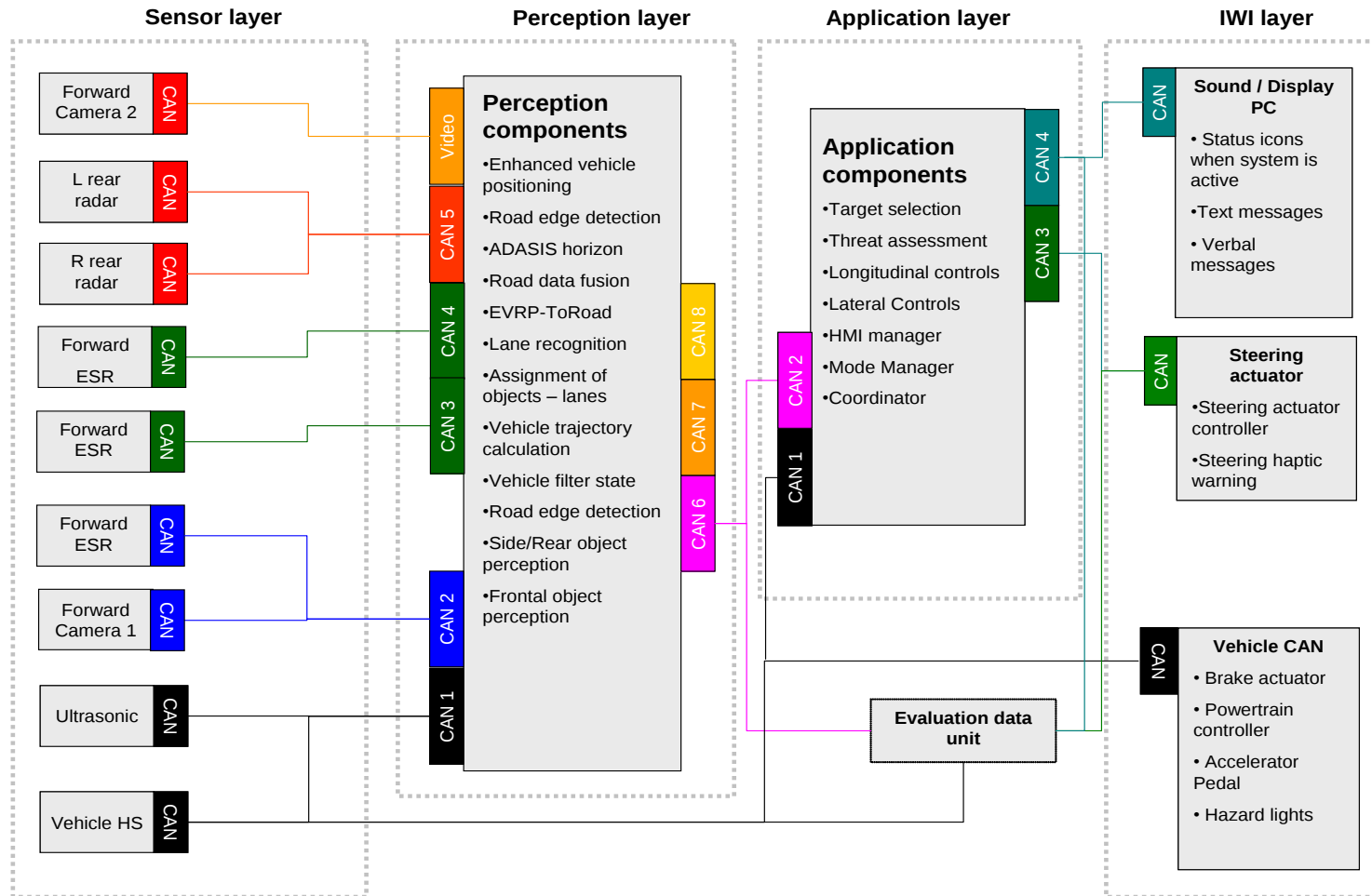


Ford Demonstrator – IWI components

- Display
- Audio: Acoustic warning
- Haptic accelerator pedal
- Steering wheel
- Individually braked wheels



Ford Demonstrator - Architecture



interactiVe demo in Lommel

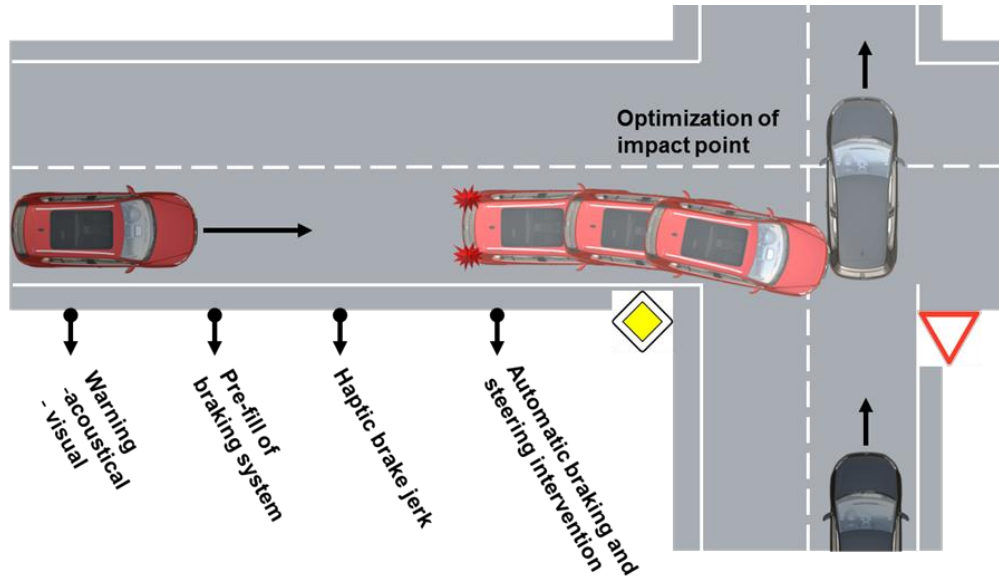


Enhanced pass prediction demo



- eDPP indicates road sections that are not safe for overtaking.
- Graphics in the instrument cluster in the cockpit (HUD and navigation display) presents the sections of not safe for overtaking
- Additionally the driver receives info about traffic signs

Collision mitigation for crossing traffic



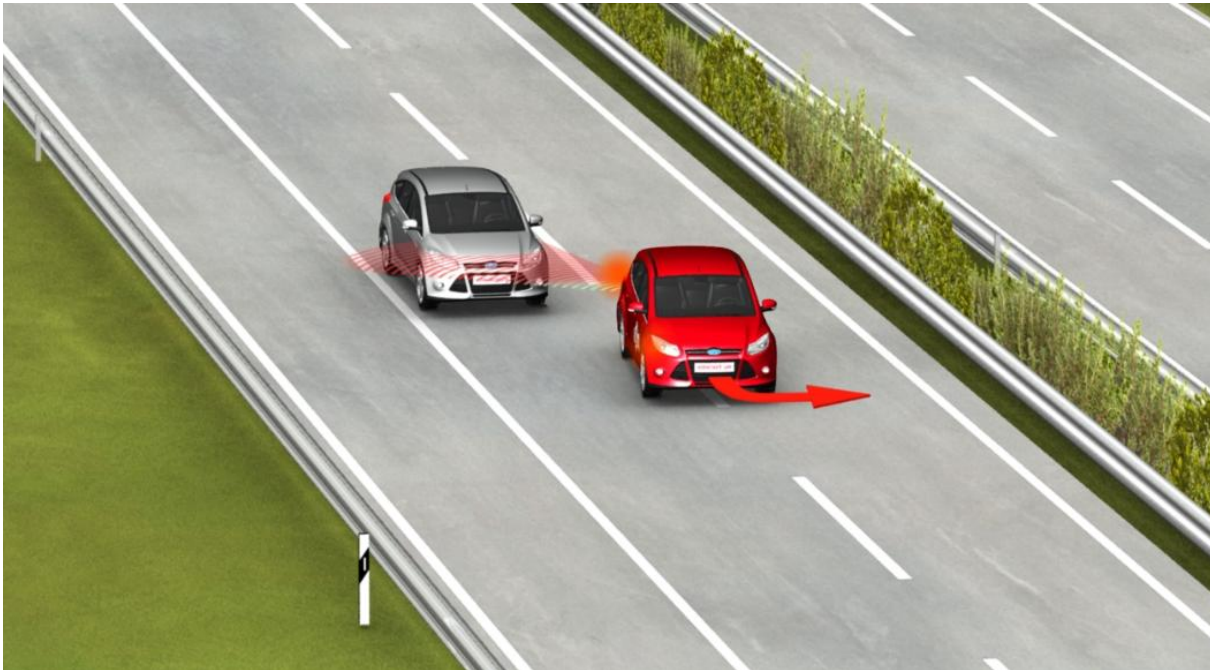
Run off road demo



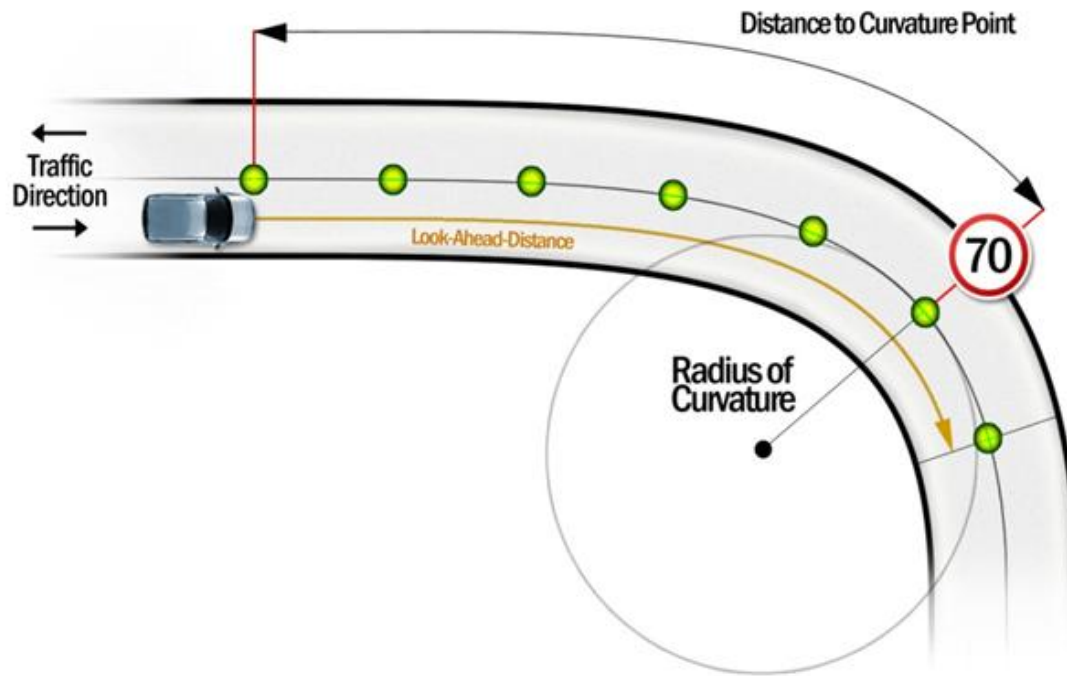
Collision Warning (static and/or moving vehicle) demo



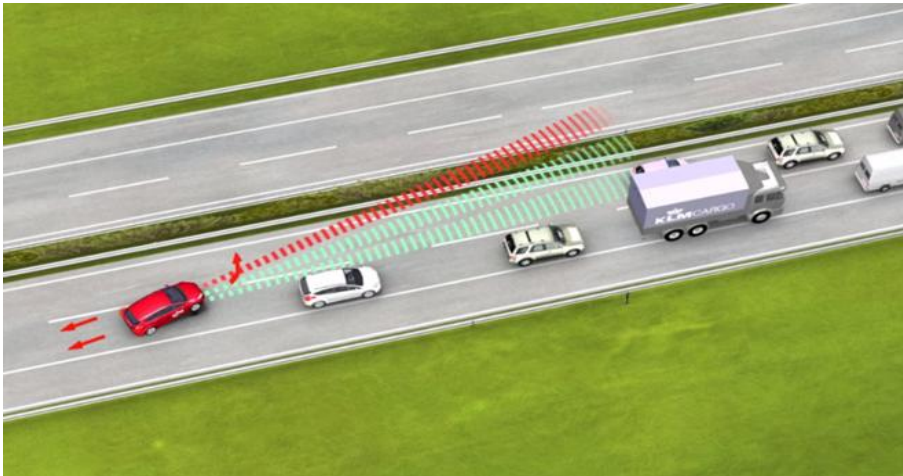
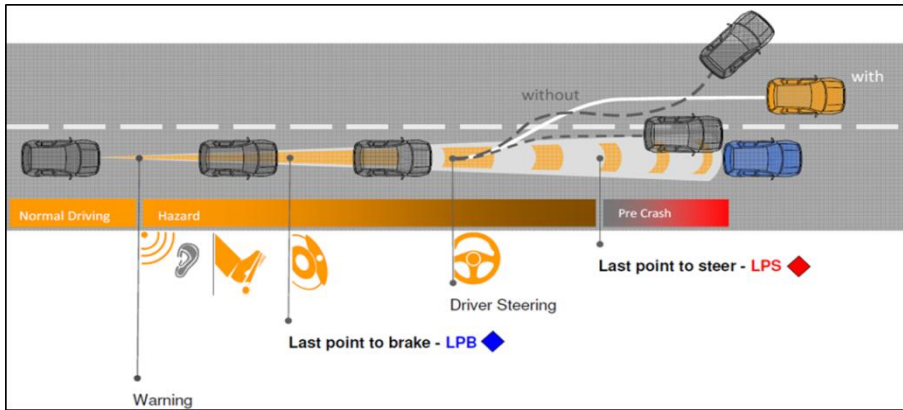
Lane change intervention/Side impact avoidance demo



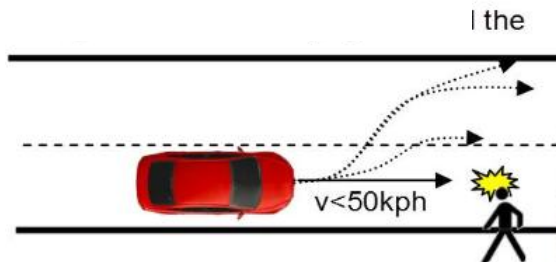
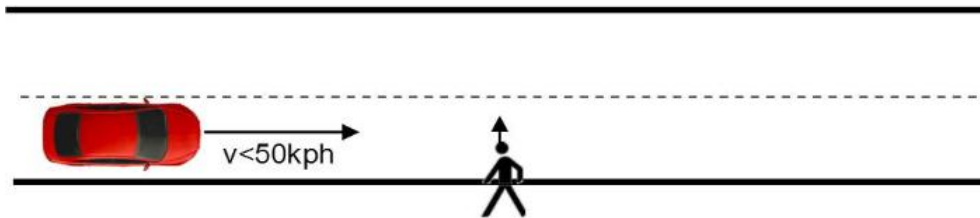
Curve speed/speed limit demo



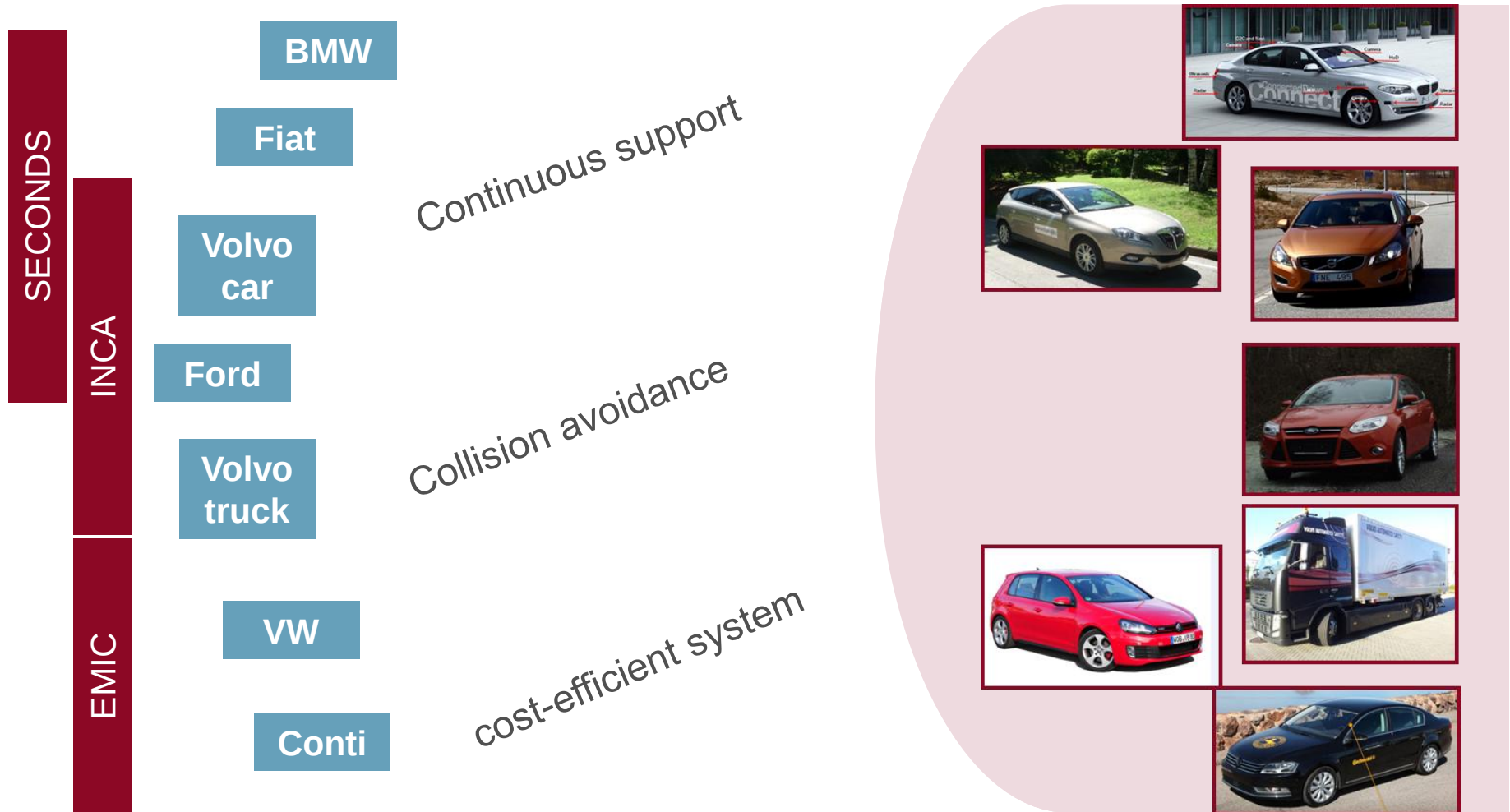
Rear end collision avoidance demo



Collision Warning and Avoidance crossing pedestrian demo



Seven Demonstrator Vehicles



Demo in Lommel: Summary

SECONDS

INCA

EMIC

BMW

Enhanced dynamic pass predictor

Fiat

Collision Warning static + moving vehicle
+pedestrian, Side Impact Avoidance,
Speed limit + curve speed warning

**Volvo
car**

Side Impact avoidance; Collision
Warning static & moving vehicle, curve
speed- and speed warning

Ford

Run-off road prevention, side impact
avoidance, curve speed warning, collision
avoidance rear-end

**Volvo
truck**

Run-off road prevention side impact
avoidance collision avoidance rear-end

VW

Collision mitigation for crossing traffic

Conti

Pedestrian collision avoidance
rear end collision avoidance



Conclusions

Let's try it!

Acknowledgements

- This work was supported by the European Commission under interactIVe, a large scale integrated project part of the FP7-ICT for Safety and Energy Efficiency in Mobility.
- We would like to thank all partners within interactIVe



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Thank you.

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SEVENTH FRAMEWORK
PROGRAMME

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