

 UTAC CERAM



**TEQMO**  
by UTAC CERAM

Technology Center  
for automated driving and connected vehicles



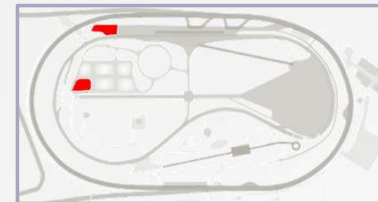
R79 - ACSF A :  
Auto-parking

### Checking of the speed limit and warning



R79 - ACSF B1 :  
Lane Keeping Functional

### Speed could be reach with speed limiter system or accelerator robot



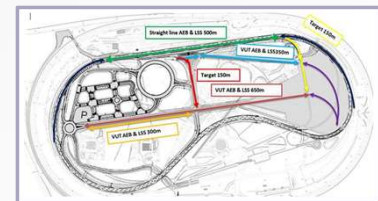
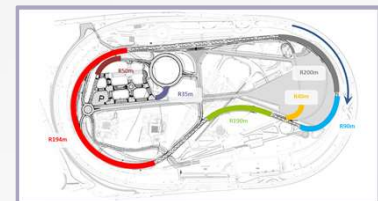
R79 - ACSF B1 : Maximum  
Lateral Acceleration

### Checking of the maximum lateral acceleration of ACSF intervention



R79 : Emergency  
Steering Function

### Unintentional / intentional lateral maneuver type A (I, II, III) and type B



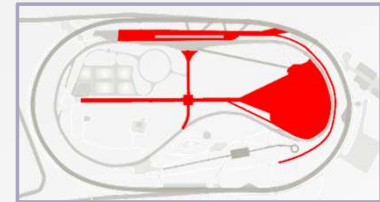
R79 - ACSF B1 : Transition

When ACSF maintains the vehicle in lane, release the steering wheel until the ACSF deactivation



R13-H Annex 8 : Evaluation of the performances

Warning and actuation test with a stationary car with different overlap



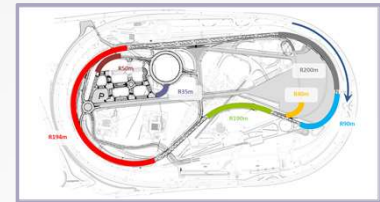
R130 : Lane Departure Warning System

The lane markings depends on the scenario



R131 : AEBs Evaluation for category M<sub>2</sub>, N<sub>2</sub>, M<sub>3</sub>, N<sub>3</sub>

Laden and unladen test with a moving car



## Automatic Lane Keeping Systems (ALKS)

- Highway Traffic Jam scenario



## HMI & Driver Monitoring

- A dual control vehicle is available.
- The participant must drive and perform different distractive tasks.
- A co-pilot on the passenger side takes over if necessary.
- Malfunctions are generated by an Ergonomist placed in Rank 2.



TEST CONDITION

### Emergency Maneuver (EM)

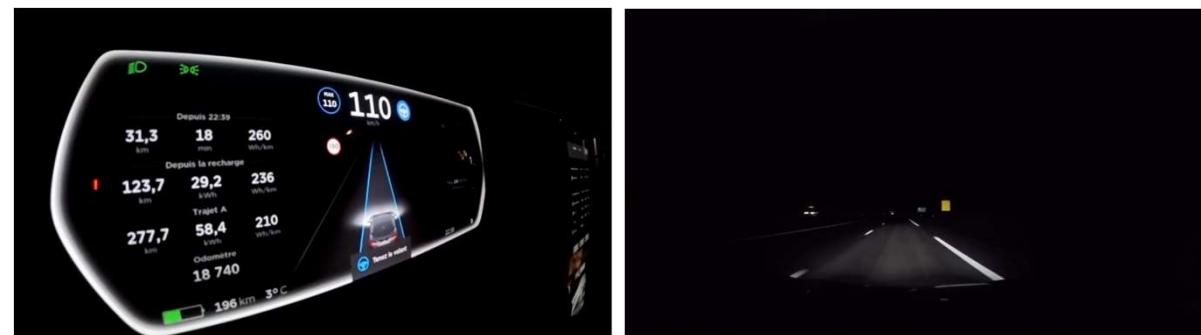
- Maneuver performed by the system in case of a sudden unplanned event in which the vehicle is in imminent danger of a collision with the purpose of avoiding or mitigating a collision.
- Choice of the technology.



TEST CONDITION

### Minimum Risk Maneuver (MRM)

- Driver not available



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## AEB - C2C Junction and Crossing



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## AEB - VRU



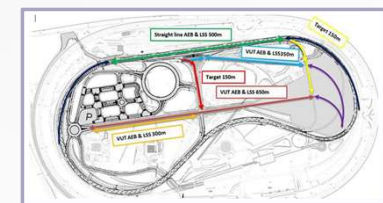
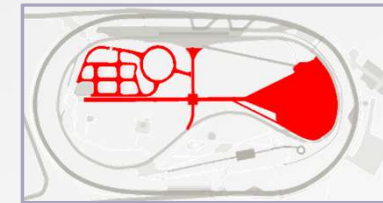
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## Cut-in scenario



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## Cut-out scenario



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## Urban Traffic Jam



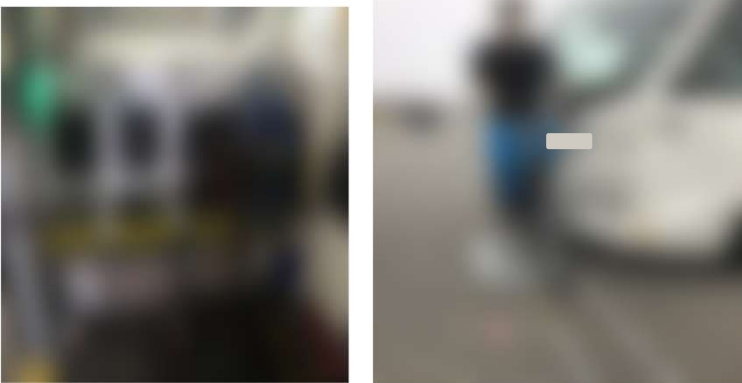
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## Blind Spot



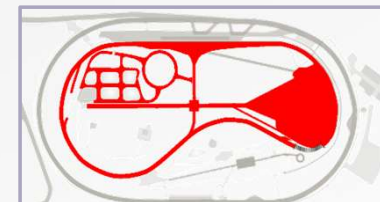
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## Autonomous Urban Shuttle



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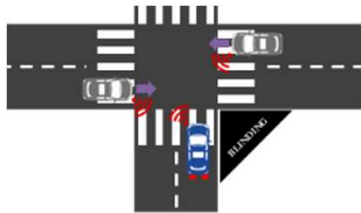
## Crossing Stationary Car





### V2V : intersection crossing

City area



### V2N : crash warning / toll warning

Highway circuit (toll zone)



### V2V : hidden straight oncoming

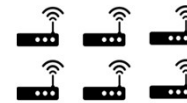
ADAS dynamic platform



### In collaboration with



CAM + Jamming



• 25 units

V2X emulation platform



• Remote & multi-parameter control  
• Logs storage analyses



ISO 17025 Laboratory



## AV simulation

SCANer<sup>®</sup>studio

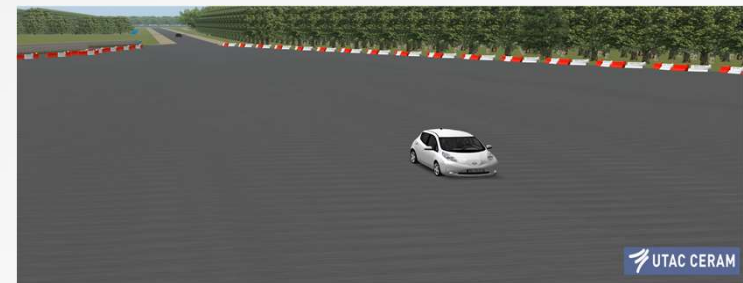


MATLAB<sup>®</sup>  
& SIMULINK<sup>®</sup>

## Virtual testing



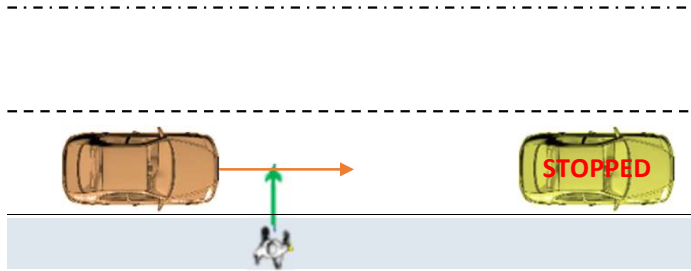
- Physical testing experience implemented into simulation UTAC CERAM 3D track
- Help customer to focus on his physical test plan
- Full UTAC CERAM test track scanned in HD
- Euro NCAP digital scenarios
- Correlation method between simulation/physical test
- Expertise and building of the future AD regulation
- Audit and digital type approval



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## AD capability to manage several parameters during an AEB C2C

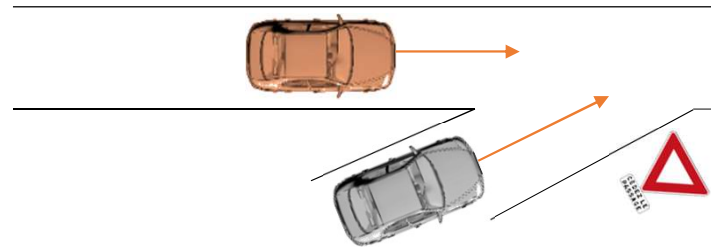
- Multi-target : Car and VRU



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## AD capability to manage aggressive entering vehicles

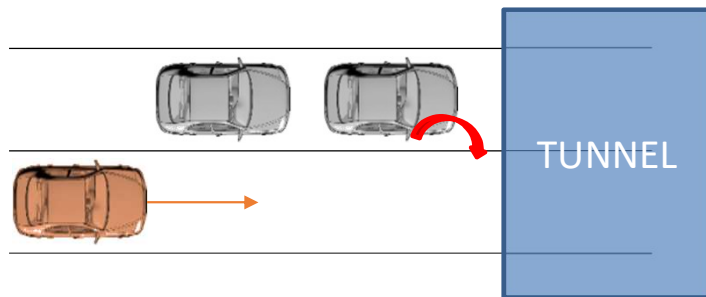
- 2 scenarios : entering has priority or not



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## Suddenly difficult perception

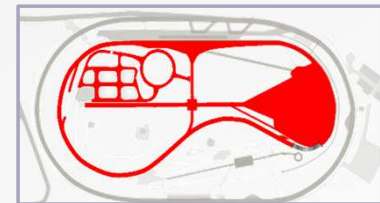
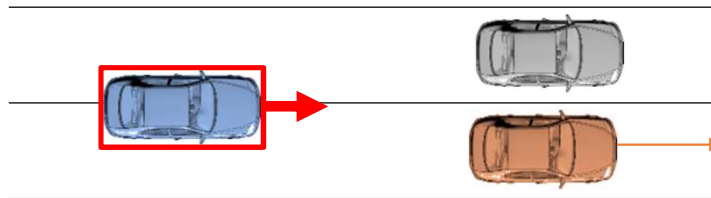
- Caused by tunnels



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## Useful scenarios

- Priority vehicles



### ➤ MUSE : Motorbike Users Safety Enhancement

➤ European project to act against the high level of motorcyclist deaths.



#### Objectives

- The development of protocols of test and assessment
- The evaluation of the most suitable ADAS systems to avoid this kind of accidents

#### PROJECT LEADER



#### PARTNERS



#### Methodology

1. Accident Data Study
2. Target characterization and development
3. Propulsion system development
4. Test and assessment protocols definition
5. Study of the possible technical solutions



### ➤ BRAVE : Bridging gaps for the adoption of Automated Vehicles



#### Project description

- European research project on AD
- Timeline : June 2017 – June 2020
- Market study, design, simulation, prototyping, testing and open roads validation of one vehicle prototype with innovative HMI & ADAS
- This vehicle is able to read, anticipate, understand and manage driver, pedestrian intentions and movements (head, members,...)

Coordination-project management

The logo for treeologic, featuring a stylized tree icon and the word "treeologic" in a lowercase, sans-serif font.

Open-road validation

Logos for RACC (a yellow square with the text "RACC"), AMZS (a yellow square with the text "AMZS"), and ACFR (Australian Centre for Field Robotics, featuring a stylized sailboat icon).

Market study

Logos for Universidad de Alcalá (a blue crest with a crown) and CALIFORNIA PATH (a stylized "PATH" logo with a yellow and blue color scheme).

Design Implement

Logos for Fraunhofer IAO (a green and white logo) and ifes (Institut für empirische Sozialologie an der Universität Erlangen-Nürnberg, featuring a stylized "ifes" logo).

Communication Dissemination

The logo for moveo, featuring the word "moveo" in a lowercase, sans-serif font and the tagline "Imagine mobility" with a colorful bar chart.

Simulation

The logo for vti, featuring the letters "vti" in a bold, lowercase, sans-serif font.

Testing Pre-regulation Euro NCAP target

The logo for UTAC CERAM, featuring a stylized "UTAC CERAM" logo with a blue and white color scheme.

### ➤ A common project between UTAC CERAM and Fondation MAIF to conduct consumerist tests on SAE Level 2 vehicles



#### Objective

- Access and highlight the benefits and the limits of SAE Level 2 vehicles



#### Methodology

- Evaluation of 4 vehicles on open roads of the main characteristics of automated driving, functional study, accentological research on risk scenarios
- Development of objective test methods for several critical scenarios of 2 closed-circuit vehicles
- Declination and deepening of the most relevant methods on 4 vehicles on circuit and final assessment
- 935 tests ; 1,500 videos ; 2.5To of data



#### Main conclusions

- Necessity to maintain the driver's vigilance
- Prevent overconfidence in the systems
- Vigilant manual driving is still safer than automated driving
- Repeatability of the systems could be improved
- Perfectible HMI systems
- **ADAS systems are very useful in case of a lack of intention from the driver**

## TEEMO by UTAC CERAM in the service of safety



# TEQMO

by UTAC CERAM

*At the heart of innovation to fill your future expectations!*

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