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*Adapt|!|Ve*

*Automated Driving Applications and  
Technologies for Intelligent Vehicles*

## *Impact Assessment in Adapt|Ve*

*Workshop on Connected and Automated Driving Systems*



# // Content

- AdaptIVe
- Safety Impact Assessment



# // Adaptive Facts

Budget: EUR 25 Million  
European Commission: EUR 14,3 Million

Duration: 42 months (January 2014 - June 2017)

Coordinator: Aria Etemad, Volkswagen Group Research

8 Countries: France, Germany, Greece, Italy, Spain, Sweden, The Netherlands, United Kingdom



# // AdaptIVe Project Overview

Widespread application of automated driving to improve road safety and address inefficiency in traffic flow whilst mitigating the environmental impact of road traffic //

Legal issues,  
terminology



Strategies for human-vehicle  
integration



New evaluation methods,  
impact assessment



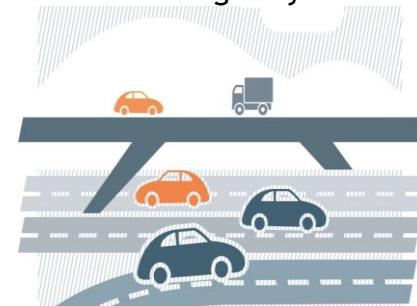
Automated driving close  
distance manoeuvring



Automated driving in  
urban environment



Automated driving  
on highway



# // Demonstrators



Parking assistance,  
garage, special areas,  
multi-level garage,  
Stop & go

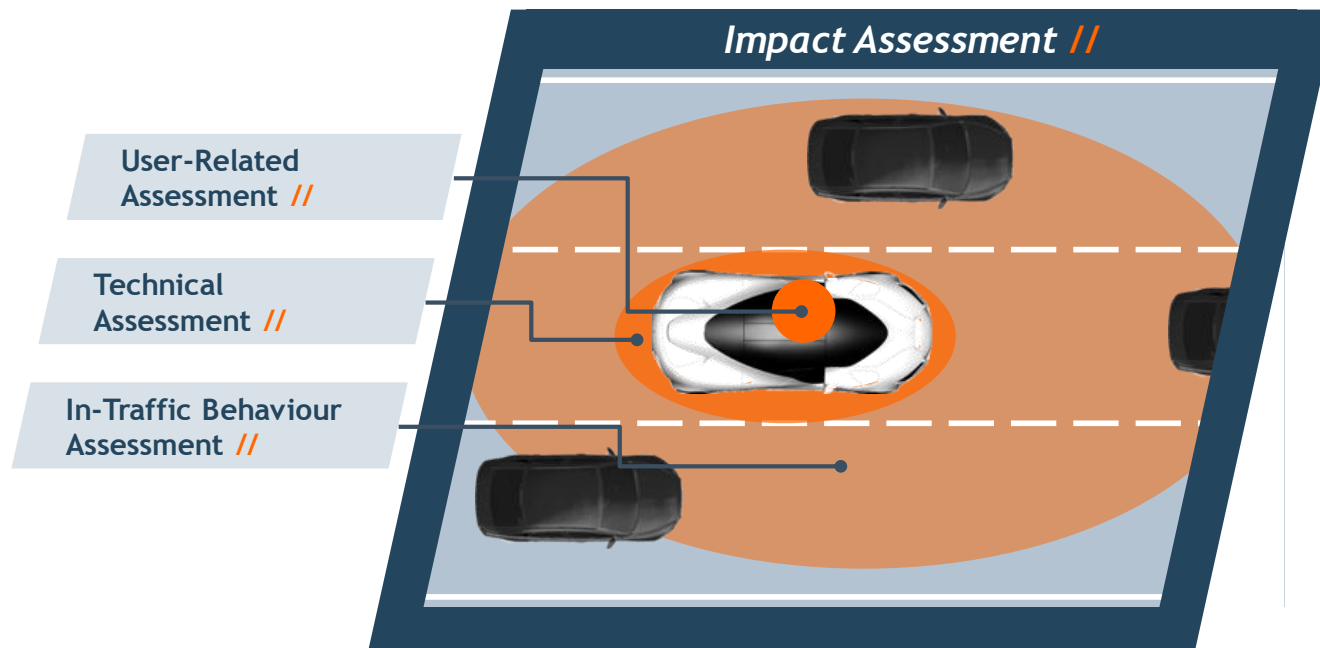
City cruise, City chauffeur,  
Supervised city control

Enter & exit highway,  
following lane, lane-  
change, filter-in,  
overtaking, danger spot  
intervention, Stop & go

Safe stop

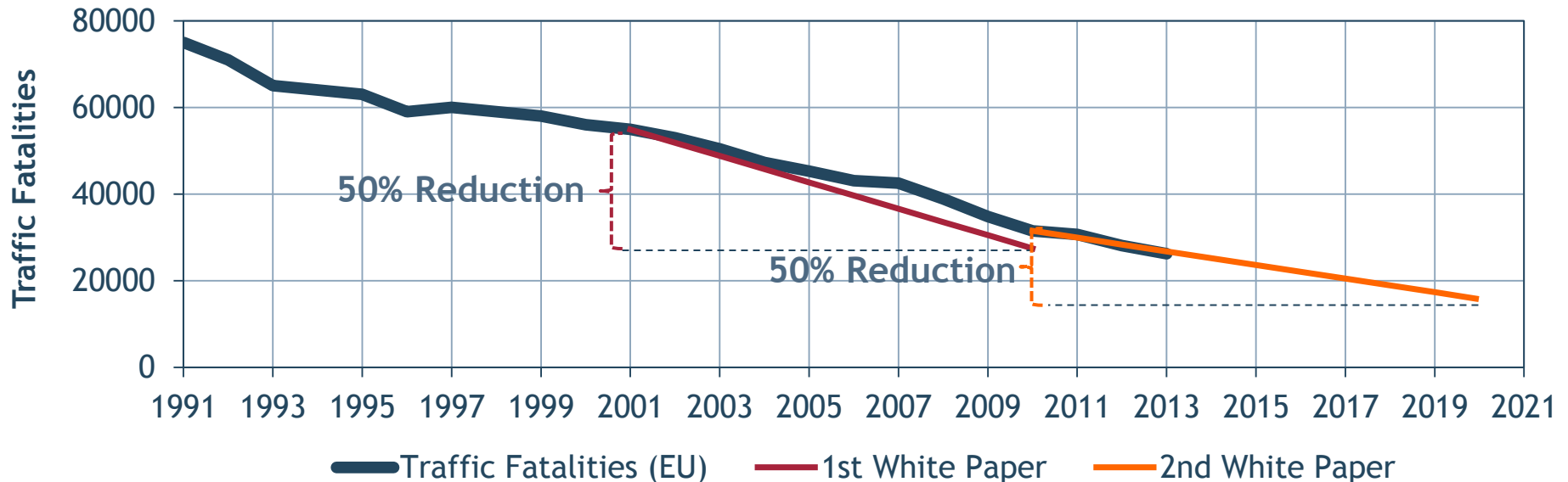
# // AdaptIVe SP „Evaluation“

- Main objectives:
  - Development of an evaluation framework for automate driving functions
  - Methodology for impact analysis of automated driving applications
    - Safety and environmental impact assessment
- Partners:
  - ika, BMW, CRF, BAST, TNO, CTAG, Lund



# // Safety Impact Assessment

## Traffic Safety in EU



- Causes of Accidents<sup>1</sup>



- Research Question: How many accidents can be prevented by automated driving applications?

1: Source: GIDAS Database

# // Safety Impact Assessment Evaluation Approach

- Classical approach for ADAS
  - Field of application
    - Identify possibly affected accidents, but no detailed analysis of effects
  - Accident re-simulation
    - Reconstruct and re-simulate real accidents under consideration of the system
  - Field test / data
    - Investigate system behaviour in real traffic
- Need for harmonization of methodologies! (harmonization group pre-crash evaluation)
- Open issues for the impact assessment of automated driving applications
  - Today's accident data do not consider collisions of automated vehicles
  - Automated driving function operate already before a critical situation occurs → Re-simulation of accidents gets more difficult
  - Interaction with other road users (automated / non-automated) → mixed traffic
- Need for research!



# // Safety Impact Assessment AdaptIVe Approach

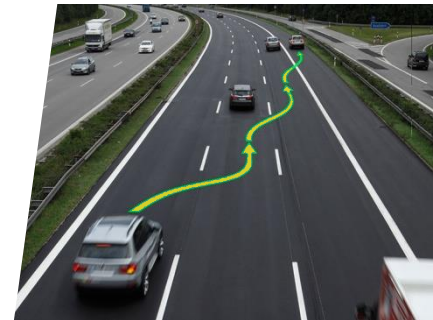
Safety impact assessment in AdaptIVe is a two steps approach

## 1. Identify relevant critical situations

- Focus on accident and other (relevant) driving situations
  - Use of microscope traffic simulation
- Which situation reduce the risk of an accident? Which situation increase the risk of an accidents?
  - Is there a change in the distribution of accident?
  - Transition of control situations (system → driver)

## 2. Investigate the relevant critical situation in detail

- Approach could be similar to re-simulation approach
- Input data from other assessment (technical, user-related, in-traffic assessment) are taken into account



Source: <http://files.coloribus.com>, [www.7-forum.com](http://www.7-forum.com), ika



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# AdaptiVe

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*Thank you.*

