Piloting Automated Driving on European Roads

SIP-adus Workshop

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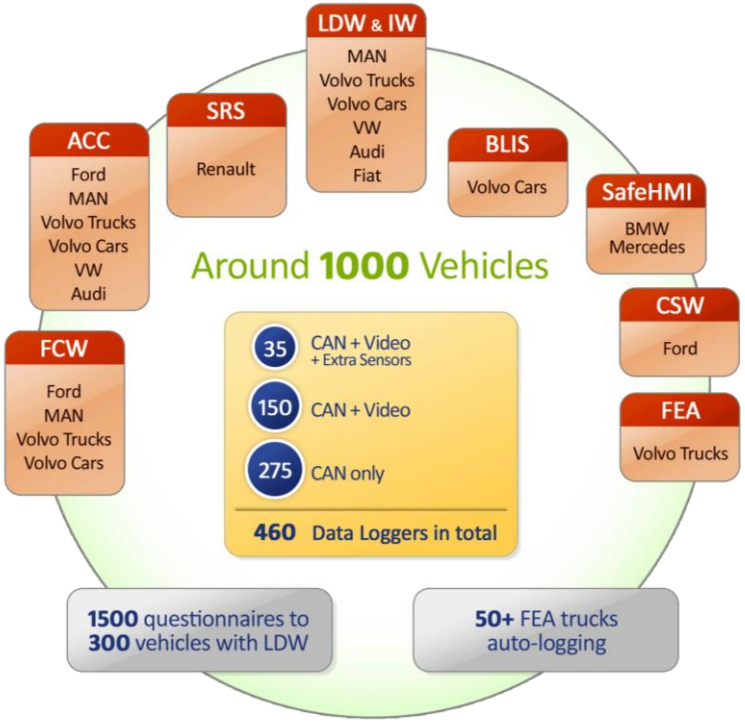
VOLKSWAGEN
AKTIENGESELLSCHAFT


L3Pilot
Driving Automation
1,000
drivers
100
cars
10
countries

From euroFOT to L3Pilot

euroFOT



Longitudinal control functions

- Forward Collision Warning (FCW)
- Adaptive Cruise Control (ACC)
- Speed Restriction System (SRS)

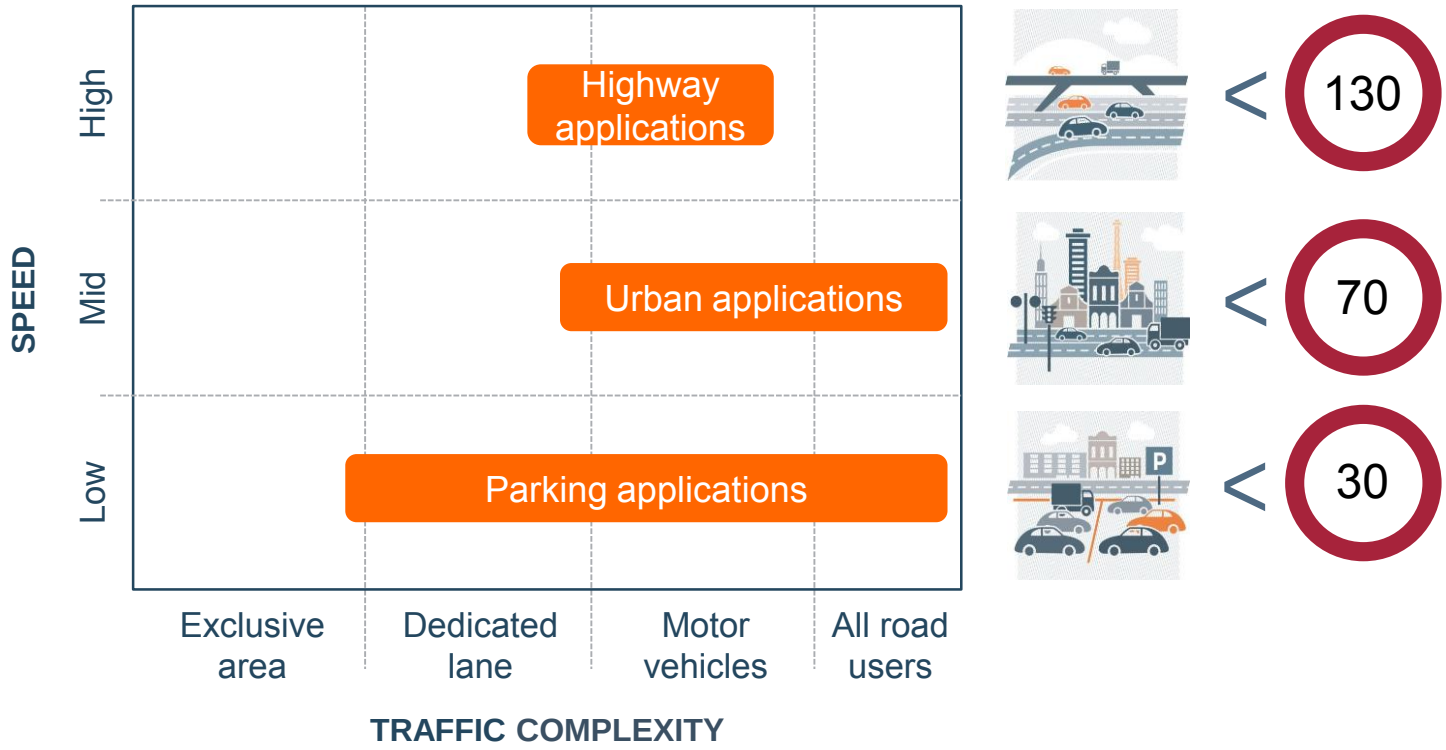
Lateral control functions

- Blind Spot Information System (BLIS)
- Lane Departure Warning (LDW)
- Impairment Warning (IW)

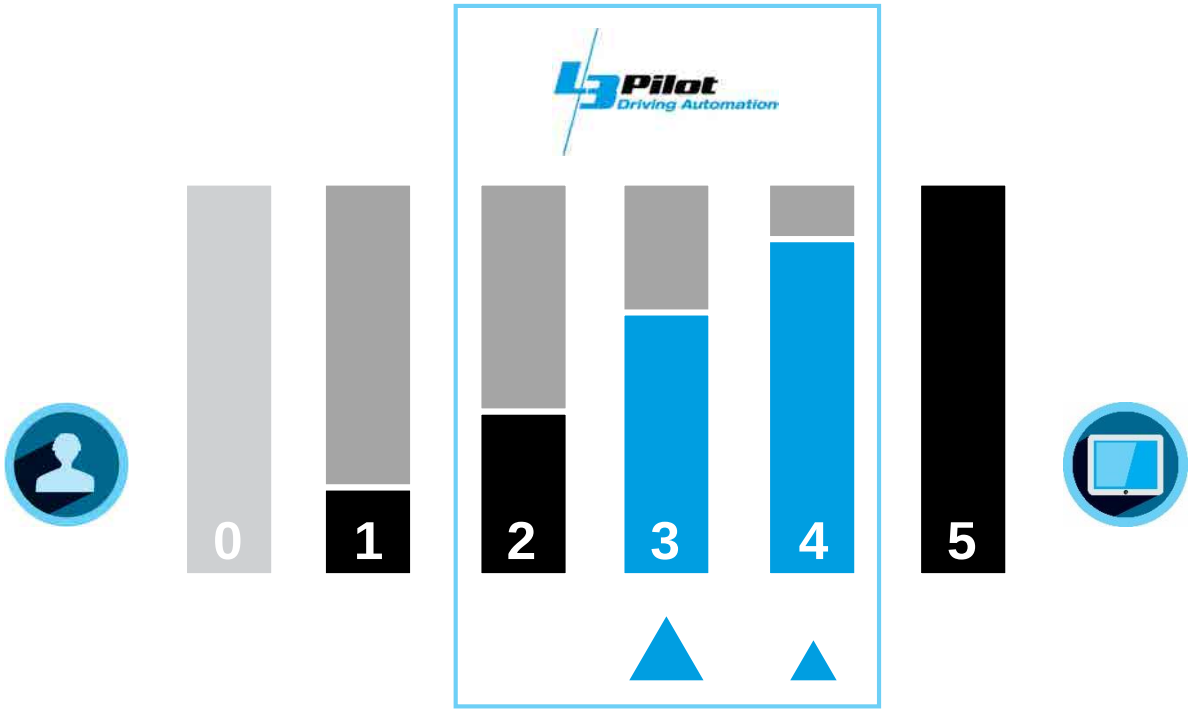
Advanced applications

- Curve Speed Warning (CSW)
- Fuel Efficiency Advisor (FEA)
- Safe Human Machine Interaction (SafeHMI)

AdaptIVe


SPEED
High
Mid
Low
Highway applications
Urban applications
Parking applications
Exclusive area
Dedicated lane
Motor vehicles
All road users
TRAFFIC COMPLEXITY
< 130
< 70
< 30

SAE levels



See SAE document J3016, “Taxonomy and Definitions for Terms Related to Driving Automation Systems for On-Road Motor Vehicles”, revised 2016-09-30, see also http://standards.sae.org/j3016_201609

L3Pilot
Driving Automation

Use Cases

Motorway

Traffic Jam

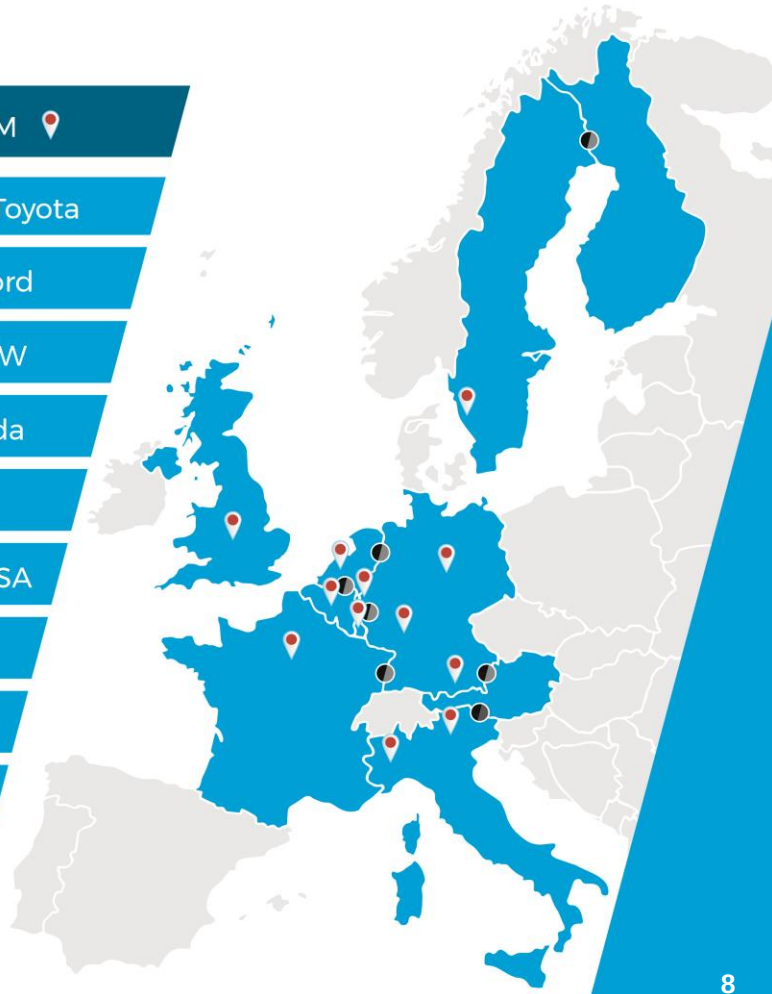
Urban

Parking

1,000 drivers 100 cars 10 European countries

Pilot across Europe

CROSSBORDER		COUNTRY / REGION / OEM	
Austria	Germany	*BE* / Brussels / NL	Toyota
Austria	Italy	*DE* / Aachen	Ford
Belgium	Germany	*DE* / Munich	BMW
Belgium	Netherlands	*DE* / Offenbach	Honda
Finland	Sweden	*DE* / Wolfsburg	VW
France	Germany	*FR* / Paris and other regions	REN / PSA
Germany	Netherlands	*IT* / Turin and Trento	CRF
		LU / *NL*	Delphi
		SE / Gothenburg	Volvo
		UK / Coventry	JLR



Facts

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€68 million BUDGET

48 months DURATION, starting in September 2017

€36 million FUNDING

34 PARTNERS, among them OEMs, suppliers, research, SMEs, insurers, authorities and user groups

12 COUNTRIES involved: Austria, Belgium, France, Finland, Germany, Greece, Italy, Netherlands, Norway, Sweden, Switzerland, UK

Partners


OEMs
VOLKSWAGEN
AKTIENGESELLSCHAFT
BMW GROUP
FCA
FIAT CHRYSLER AUTOMOBILES
DAIMLER
Ford
PSA
GROUPE
GROUPE RENAULT
HONDA
The Power of Dreams
JAGUAR
LAND ROVER
TOYOTA
VOLVO
Suppliers
APTIV
FEV
veoneer
SMEs
ADAS Management-Consulting
Advanced Driver Assistance and Safety
eict
Researchers
bast
DLR
Deutsches Zentrum
für Luft- und Raumfahrt
German Aerospace Center
ika
RWTH AACHEN UNIVERSITY
CHALMERS
SNF
TNO innovation for life
UNIVERSITÀ DEGLI STUDI DI GENOVA
UNIVERSITY OF LEEDS
VTT
WMG
THE UNIVERSITY OF WARWICK
Insurers
Allianz
Swiss Re
Authority
RDW
User group
FIA

L3Pilot Driving Automation

Objectives

1,000 drivers 100 cars 10 European countries Piloting Automated Driving on European Roads.

Research questions

- Research questions listed for all evaluation areas
  - Technical and traffic evaluation
  - User evaluation
  - Impact evaluation
  - Socio-economic evaluation
- ***Feasibility*** of research questions being checked from experimental procedures and evaluation methods viewpoint
- Research questions of levels 1 & 2 reported in D3.1, ***level 3 RQs*** to be fine-tuned and ***hypotheses*** to be defined along with better knowledge of the ADFs and of available evaluation methods
  - Final list of research questions to be reported in D3.4

Feasibility of impact evaluation RQs from methodology viewpoint

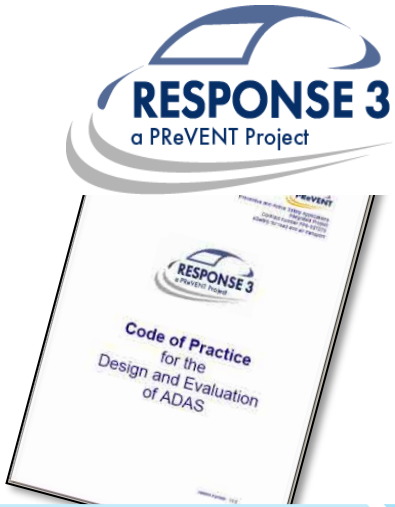
- What is the impact of ADF on the number of accidents in a certain driving scenario?
- What is the impact of ADF on the number of accidents involving other road users (such as pedestrians and bikers)?
- What is the impact of ADF on accidents with fatal injuries in a certain driving scenario?
- What is the impact of ADF on accidents with severe injuries in a certain driving scenario?
- What is the impact of ADF on accident with slight injuries in a certain driving scenario?
- What is the impact of ADF on accidents with material damages in a certain driving scenario?
- What is the impact of ADF on rescue chain in terms of preventing injuries?
- What is the impact of ADF on traffic flow?
- What is the impact of ADF on the available parking space?
- What is the impact of ADF on fuel efficiency?
- What is the impact of ADF on energy demand?
- What is the impact of ADF on CO2 emissions?
- What is the impact of ADF on trip duration?
- What is the impact of ADF on trip distance?
- What is the impact of a changed travel speed?
- What is the impact of ADF on the frequency of certain accident scenarios?
- What is the impact of ADF on the frequency of certain driving scenarios?
- How do the ADF limitations influence the impact on safety / efficiency?

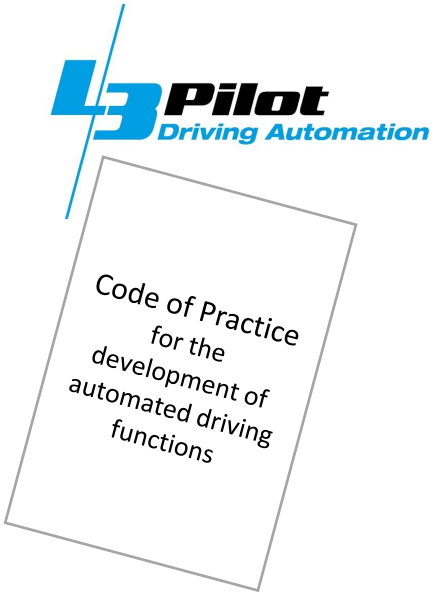
Code of Practice (CoP)

Provide a comprehensive guideline with best practices for the development of functions: Code of Practice for Automated Driving.

- Collect best practices on relevant topics.
- Describe a typical process for an Automated Driving function.
- Include hands-on checklists.
- Include safety aspects and methods to confirm a safe operation of Automated Driving functions

History of the Code of Practice (CoP)





PReVENT:
RESPONSE 3 „CoP ADAS“

2008

AdaptIVe:
Response 4 „Legal aspects AD“

2014 2017

L3Pilot:
„Code of Practice AD“

2017 2021

L3Pilot Annual Quantitative Survey

Desk Research | Exploration Phase | Model Development | Annual Survey | Impact

- **1st longitudinal study on** user acceptance of AD.
- **Representative**, **quantitative** and **international** approach.
- L3Pilot annual survey will provide **insights into user acceptance and attitudes** towards **automated driving** of the **general public** and its **development over time**.
- 3 public deliverables: **Annual Survey Reports**.
  First report in Q3/2019.

Recommendations for public and private decision-makers

Knowledge about future market potential for AD systems

Development of Automation Acceptance Index (AAI)

Thank you for your kind attention.

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