Hi-Drive
Designing Automation

Addressing challenges towards the deployment of higher automation

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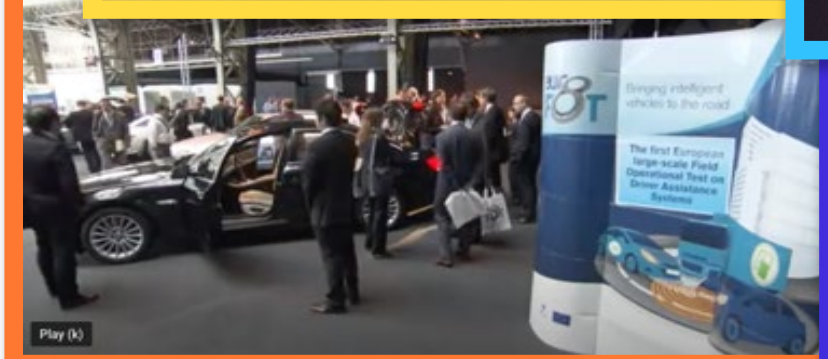
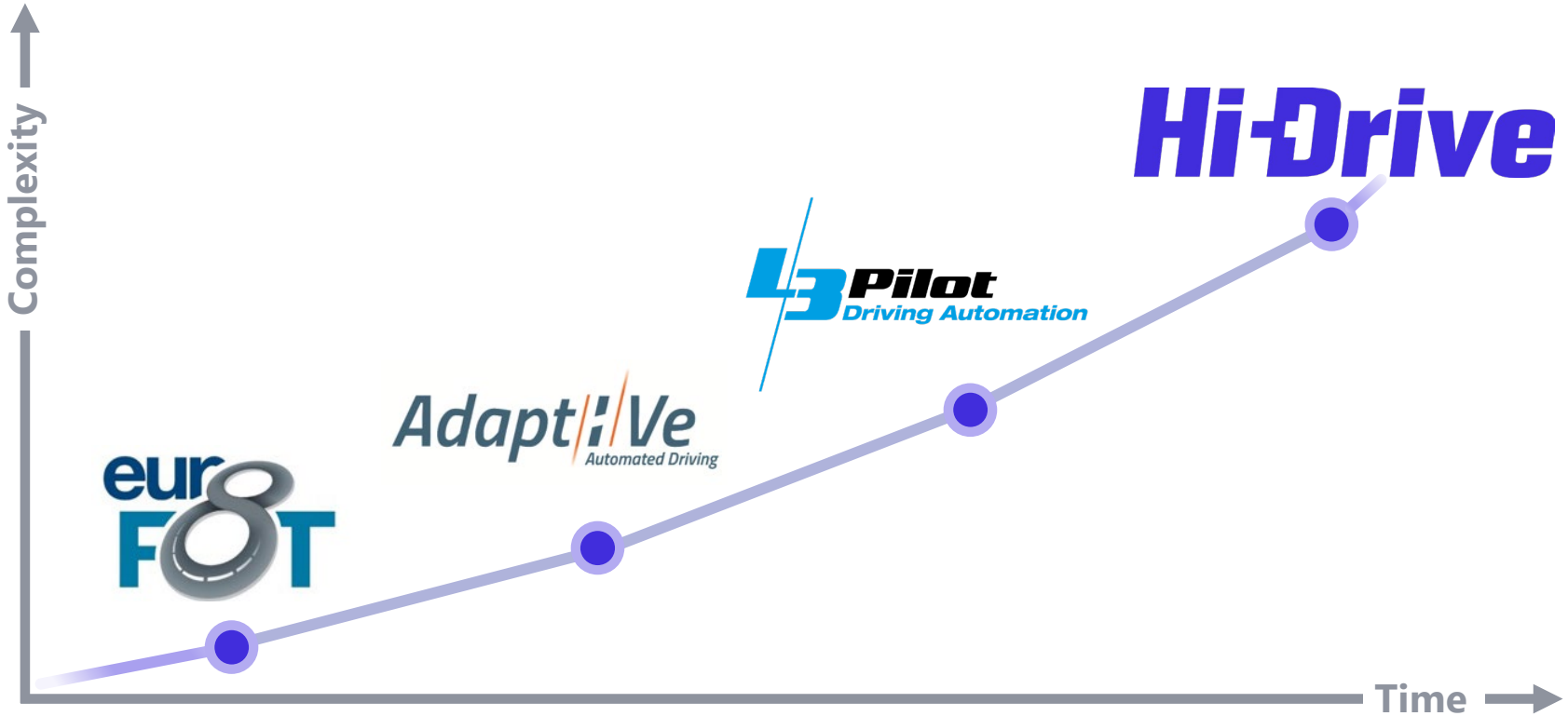
Philippe Stehlik, EICT GmbH | Aria Etemad, Volkswagen AG

Our history of automated driving: Long lasting successful collaborations



Our history of automated driving: Long lasting successful collaborations



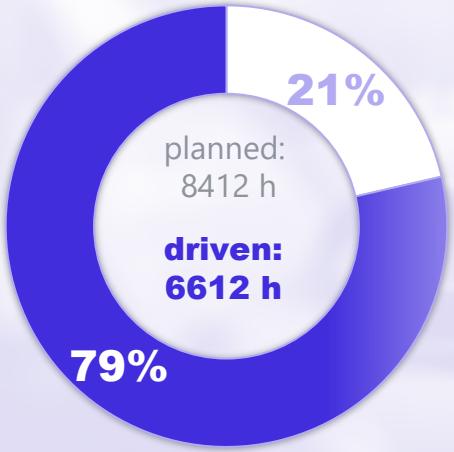
Building on the achievements of L3Pilot

Building on the achievements of L3Pilot

APPLICATIONS

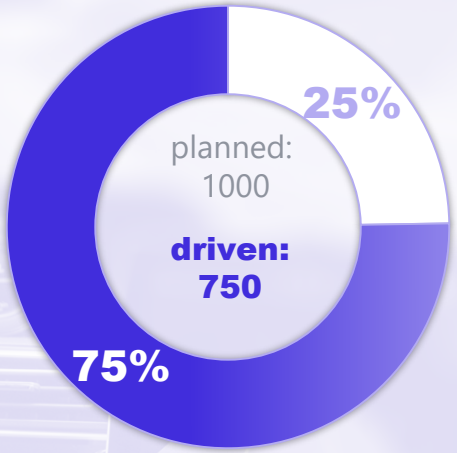
L3Pilot achieved objectives

HOURS OF DRIVING



KILOMETERS

SUBJECTS



75% DONE +600 supplementary persons in simulator studies

L3Pilot Evaluation focus points

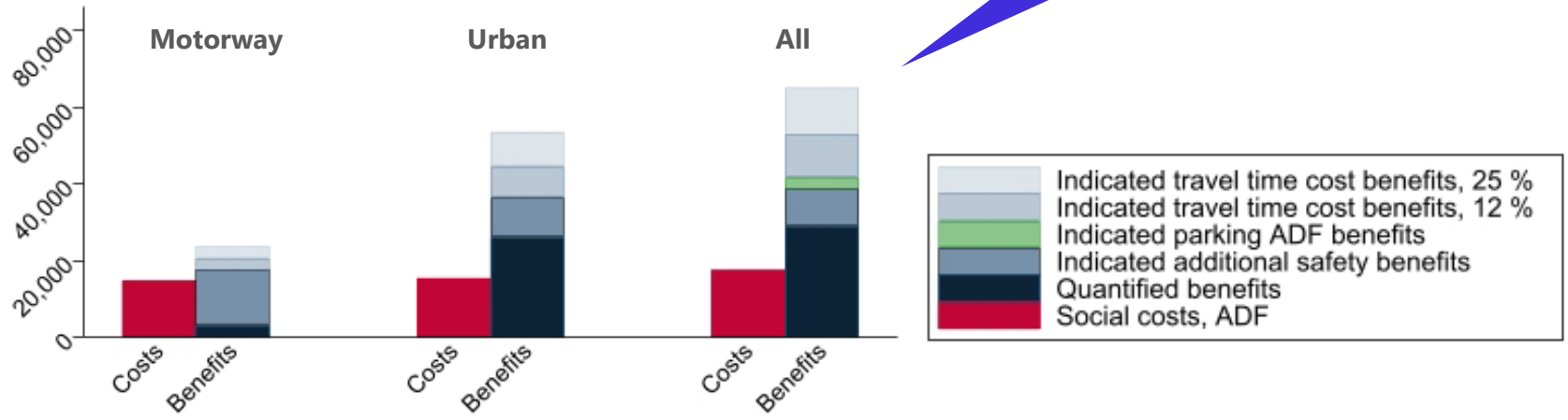
- Mobility
- Traffic Safety
- Traffic Efficiency
- Environment
- Socio-economics

L3Pilot Evaluation focus points

Socio-Economic Impacts

Assessment:

"The benefits outweigh the costs by far!"



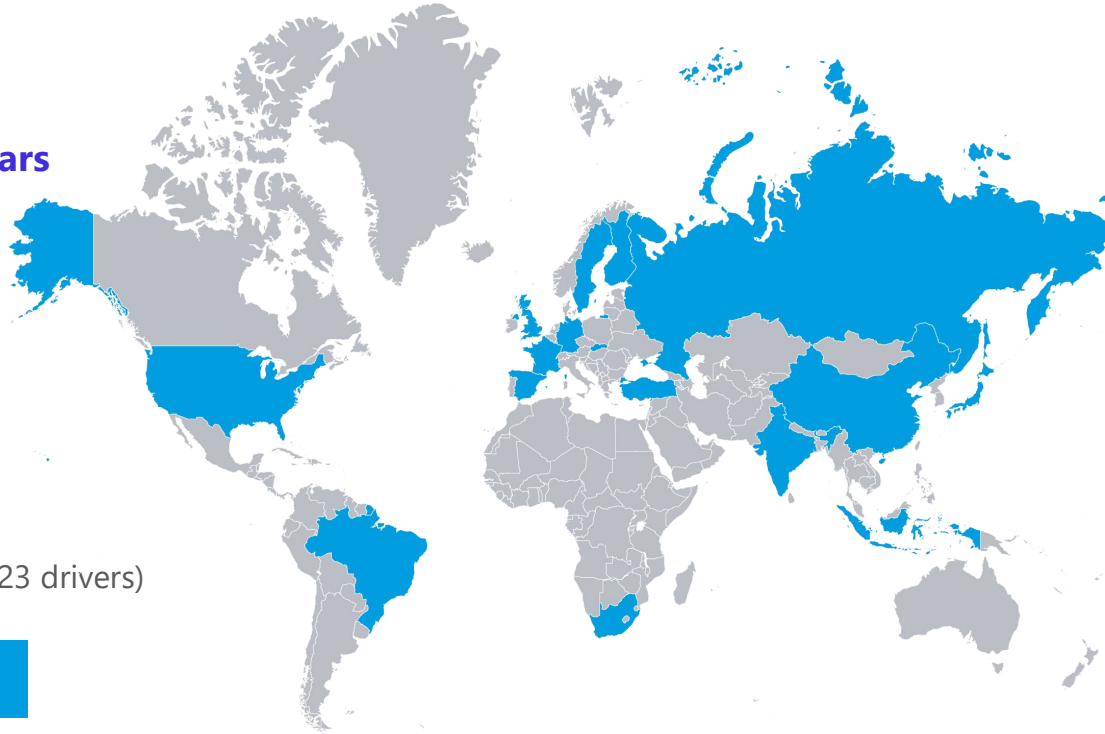
L3Pilot User Acceptance Surveys

Online survey on user acceptance of
SAE Level 3: Conditionally automated cars

A global & long term perspective study:
5 Continents – 17 Countries

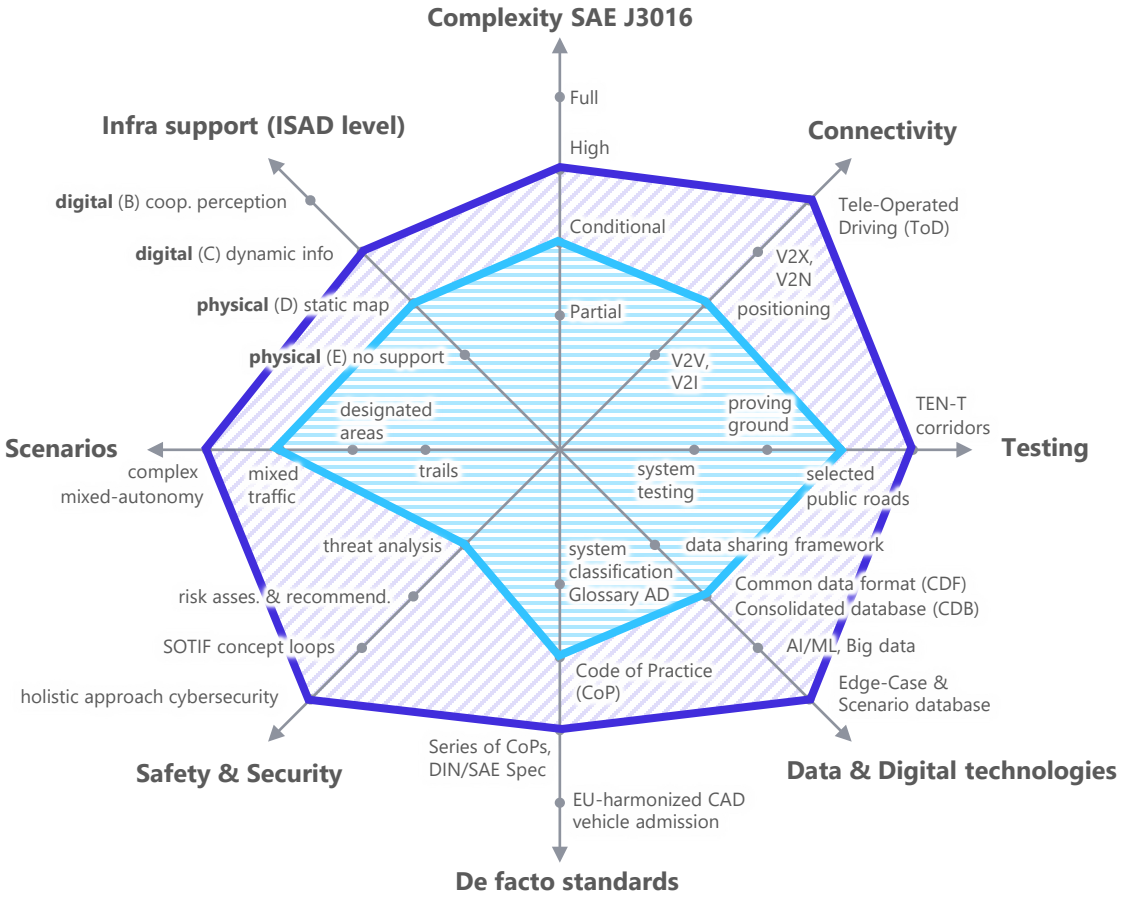
Data collection results:
36.402 car drivers surveyed

- May-June **2019** (9.118 drivers)
- February-May **2020** (9.513 drivers)
- January-February **2021** (9.339 drivers)
- **+** Impact assessment survey by VTT **2021** (8.423 drivers)



L3Pilot survey publication:
https://zenodo.org/record/5726603#.YyBeH6TP2Ht

Challenges: technology



Hi-Drive

Designing Automation

PUSH TOWARDS HIGHER AUTOMATION.

- Robust and reliable automated driving
- Extended and defragmented ODDs
- Interoperability across countries and brands

OPERATIONAL DESIGN DOMAIN (ODD)

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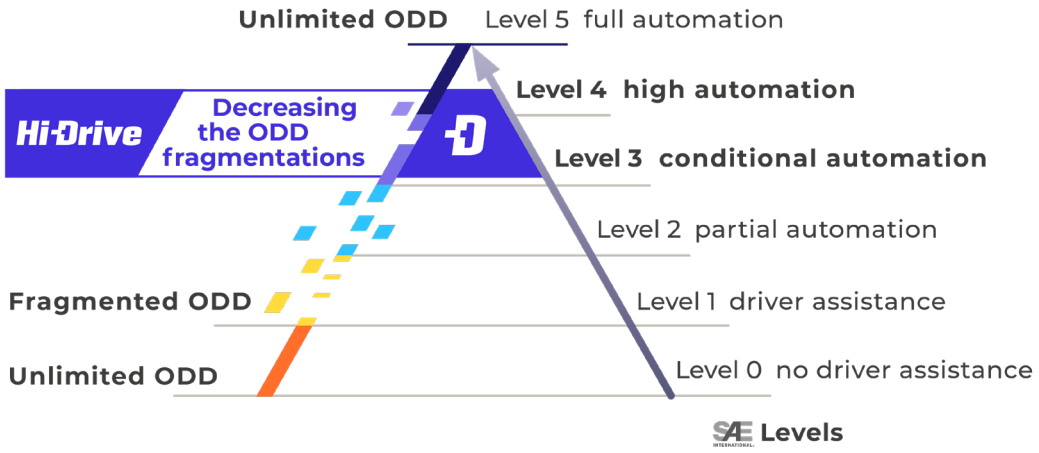
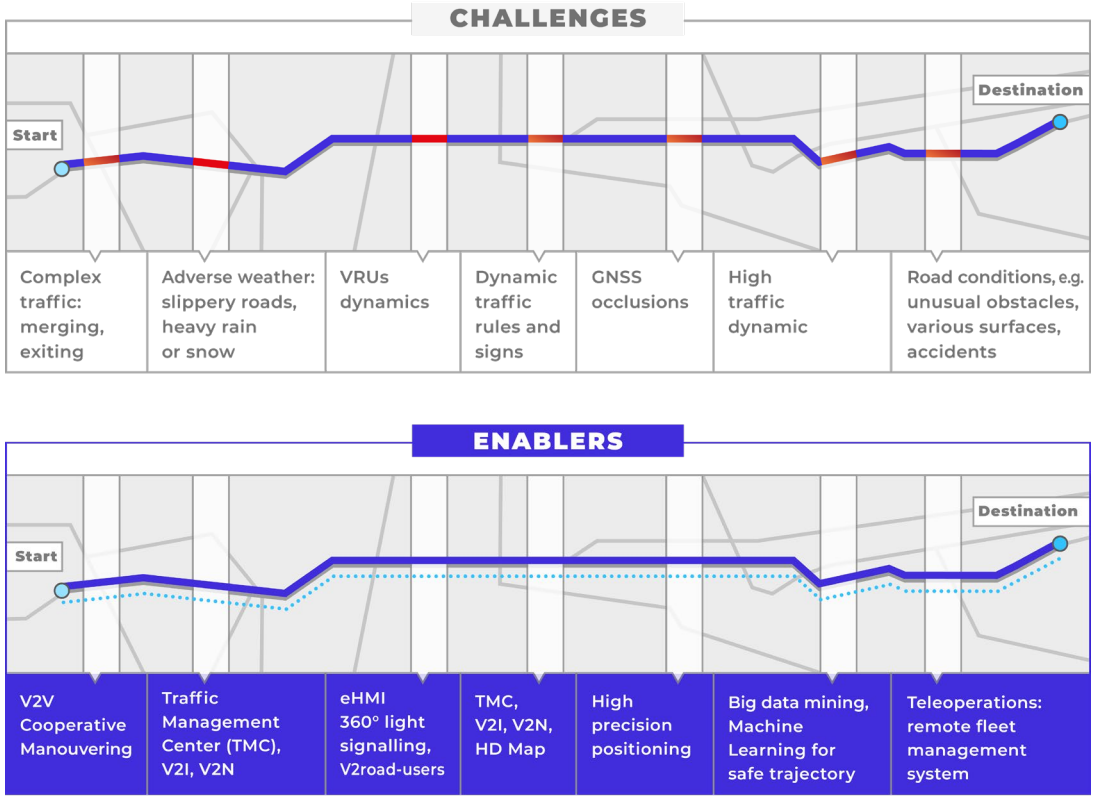


ODD - "Operating conditions under which a given driving automation system [...] is specifically designed to function [...] to environmental, geographical, and time-of-day restrictions, and/or the requisite presence or absence of certain traffic or roadway characteristics." *

*SAE J3016 (2021)

Defragmentation of the Operational Design Domain (ODD)



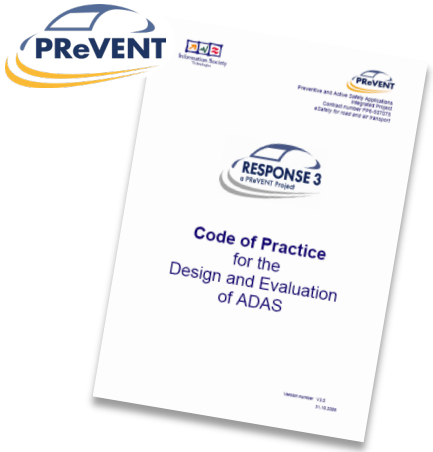
ODD

MANUAL DRIVING

AUTOMATED DRIVING

Cybersecure, interoperable, interactive and **user-aware vehicles**

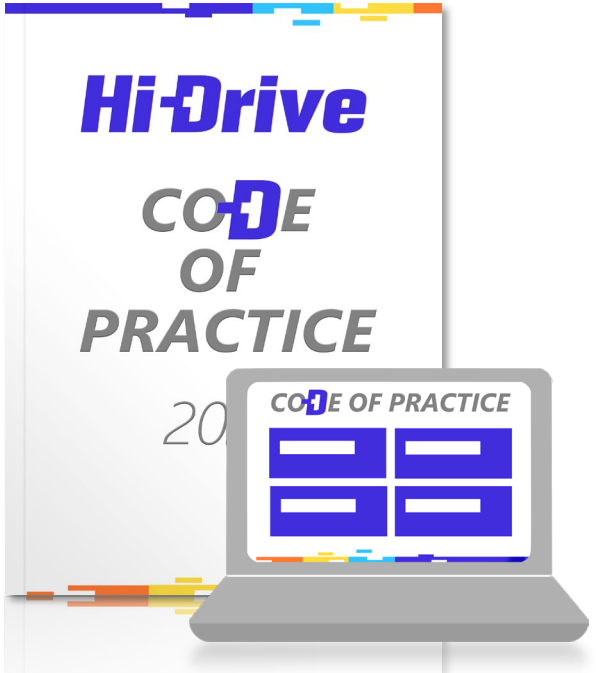
CODE OF PRACTICE (CoP) Evolution

2008	2014 - 2017	2017 - 2021	2021 - 2025
			
RESPONSE 3 „CoP ADAS“	*RESPONSE 4 „Legal aspects AD“*	*CODE OF PRACTICE for the dev. of ADFs*	*CODE OF PRACTICE CADF -?-*

CODE OF PRACTICE (CoP) **Evolution**

Further extending guidelines and best practices

- **Enablers**: Hybrid communication, Machine learning Big data, etc.
- **Cross-border solutions** for Interoperable driving
- **Non-EU regions**
- **Extension of ODD** (Urban or rural traffic scenarios)
- **Extension to other road users** (Driverless taxis, commercial vehicles)
- **Online reference tool**
  creating a dedicated searchable website



CoP - User education and training

USER EDUCATION CAMPAIGN

USER TRAINING PROGRAM

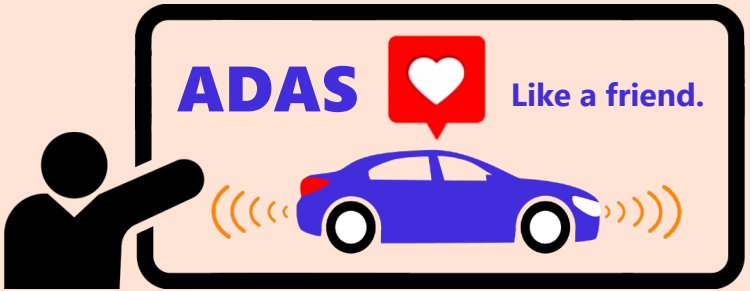
Implemented by mobility clubs

CoP - User education and training

Rectifying misconceptions | **Establishing** safe driving practices | **Advocating** for the benefits of AVs

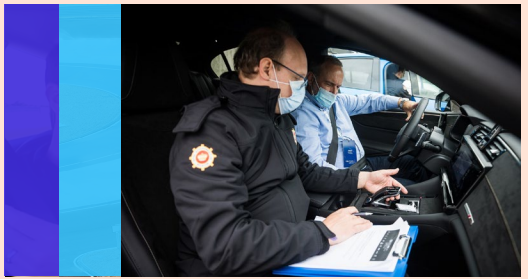
USER EDUCATION CAMPAIGN

- **Education + training** methods about system limits and capabilities
- **Information toolkit** and **driver manual** for safe use of CAVs (SAE levels 1-3)



USER TRAINING PROGRAM

- **Hands-on workshops**: experience based learning of what L3 AD **can / can not** do
- **Common curriculum** for training sites
- **training users** at Mobility Clubs across Europe



Project Facts

€60 MILLION BUDGET

€30 MILLION FUNDING

48 MONTHS from July 2021 to June 2025

40 PARTNERS among them OEMs, automotive suppliers, research institutes, associations, traffic engineering, deployment organisations and mobility clubs

14 COUNTRIES involved: Belgium, France, Finland, Germany, Greece, Hungary, Italy, Israel, Netherlands, Norway, Spain, Sweden, Switzerland, United Kingdom

eucar
EUROPEAN COUNCIL FOR AUTOMOTIVE R&D

Supported by the European Council for Automotive R&D

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101006664

Partners

VOLKSWAGEN
AKTIENGESELLSCHAFT
BMW GROUP
STELLANTIS
CRF
Ford
HONDA
The Power of Dreams
HYUNDAI
STELLANTIS
LAB
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Federación Internacional de Carreteras
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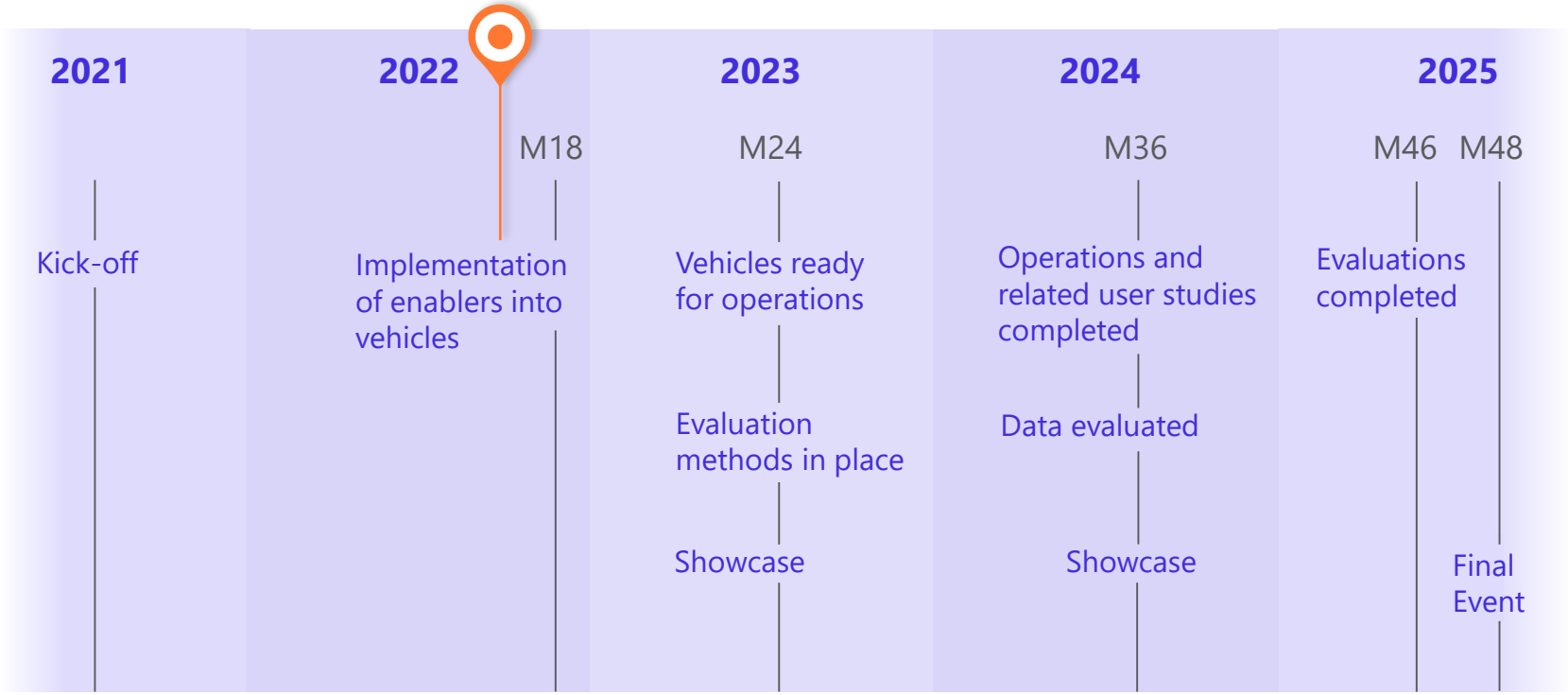
iAM RoadSmart
MAGYAR AUTÓKLUB
1909
RACC
ROYAL AUTOMOBILE CLUB OF BELGIUM

Timeline


2021
2022
2023
2024
2025
M18
M24
M36
M46
M48
Kick-off
Implementation of enablers into vehicles
Vehicles ready for operations
Evaluation methods in place
Showcase
Operations and related user studies completed
Data evaluated
Showcase
Evaluations completed
Final Event

...one last thing!

THANK YOU FOR YOUR KIND ATTENTION.

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