



Towards a Code of Practice for Automated Driving

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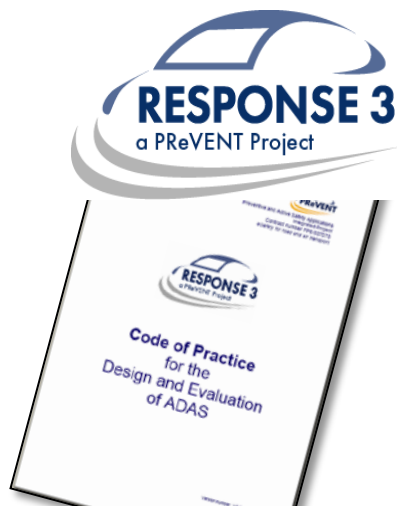


Objectives

Provide a comprehensive guideline with best practices for the development of automated driving functions: **Code of Practice** for automated driving (CoP AD)

- Collect best practices on relevant topics for developers
- 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

Code of Practice History



PReVENT:
RESPONSE 3 „CoP ADAS“

2008 2014



AdaptiVe:
Response 4 „Legal aspects AD“

2017 2017



L3Pilot:
„Code of Practice AD“

2021

Milestones so far

D2.1 Code of Practice framework (2018)

- Scope of CoP AD
- Topics and categories
- Development phases

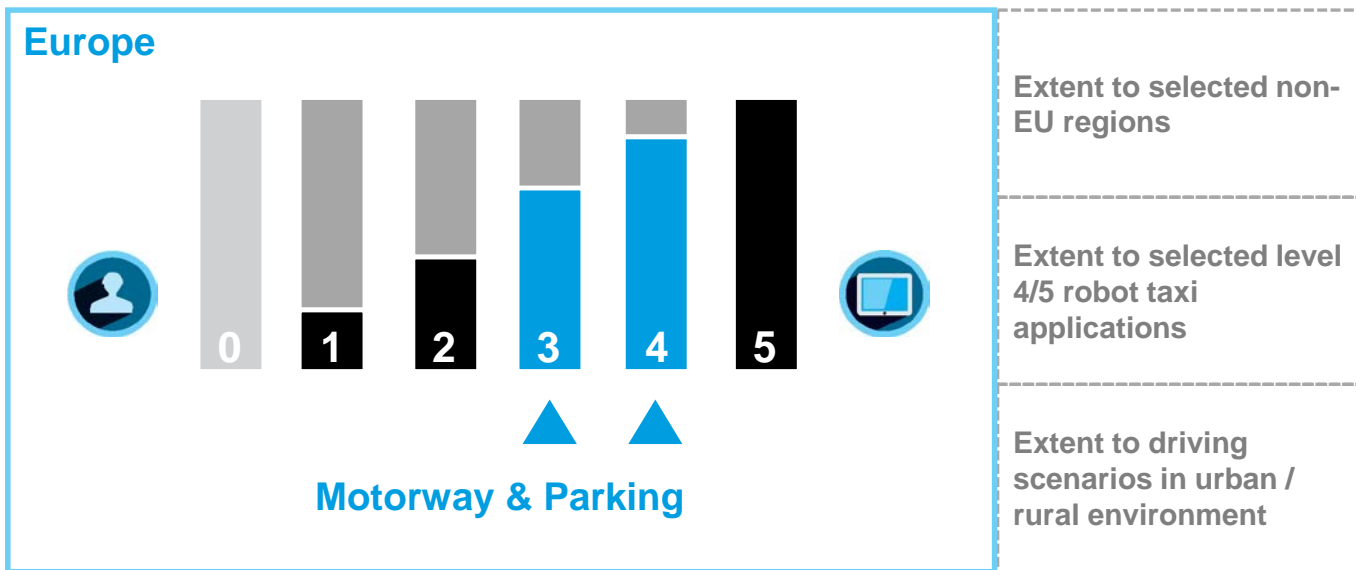
D2.2 Draft and results from pilot application of draft CoP (2020)

- Draft CoP with 163 items
- Based on thorough, iterative improvement process
- Results from pilot application





CoP AD Development Process

- Distribution of survey to L3Pilot stakeholders
 - Collection of requirements for topics and processes
- Final topic selection based on pre-defined criteria
 - Structuring of topics via categories
- Definition of CoP AD scope and development phases
 - Matching development phases and topics
- Literature review
- Phrasing of draft items
 - Iterative improvement

Scope of CoP AD



CoP AD Categories

Overall Guidelines and Recommendations Minimum Risk Manoeuvre, Documentation, Existing Standards			
ODD Vehicle Level  Function Description, System Limits, Scenarios, Testing etc.	ODD Traffic System & Behavioural Design  Automated Driving Risks, Mixed Traffic Simulation Approach, Ethics, etc.	Safeguarding Automation  Functional Safety, Cybersecurity, SOTIF, Updates etc.	Human-Vehicle Integration  Provide Guidelines for HMI, Mode Awareness/ Confusion, Controllability etc.

CoP AD Categories with Topics

Category	Topics
Overall Guidelines and Recommendations	<ul style="list-style-type: none"> • Minimal Risk Manoeuvre • Documentation • Existing Standards
ODD Vehicle Level	<ul style="list-style-type: none"> • Requirements • Scenarios and Limitations • Performance Criteria and Customer Expectations • Architecture • Testing (incl. Simulation)
ODD Traffic System & Behavioural Design	<ul style="list-style-type: none"> • Automated Driving Risks and Coverage of Interaction with Mixed Traffic • V2X Interaction • Traffic Simulation • Ethics & other Traffic related Aspects

Category	Topics
Safeguarding Automation	<ul style="list-style-type: none"> • Functional Safety • Cybersecurity • Implementation of Updates • Safety of the intended Functionality (SOTIF) • Data Recording, Privacy and Protection
Human-Vehicle Integration	<ul style="list-style-type: none"> • Guidelines for HVI • Mode Awareness, Trust & Misuse • Driver Monitoring • Controllability & Customer Clinics • Driver Training & Variability of Users

How to use the CoP AD

- Implementation of CoP AD is up to the companies:
 - Address the question directly in a dedicated process
 - Include the questions in already existing development processes
- Focus is not on solutions how to handle issues, but on things not to forget when developing automated driving functions
- Relevant questions shall be addressed according to the development phases
- Application might be eased using tools based on CoP AD document

CoP AD Question Example

Question 4-2-9	Relevant Phase(s)		CO	DS	VV	
<p>Is the communication to the driver, of the driver's responsibilities in each defined automated driving mode(s) investigated and confirmed?</p> <p>() Yes / () No</p>						<ul style="list-style-type: none">• Is a method implemented to clearly inform the user of his responsibilities and of vehicle capabilities and possibly of the result of not acting within these capabilities?• Is the communication to the driver, of the ADF's capabilities in each defined automated driving mode(s) investigated and confirmed?• Is there clear information in the user's manual, about the ADF's boundaries, and has this been confirmed?• Is additional training material to communicate the ADF's boundaries and the user's responsibilities considered?• Is a process defined on how the user will be informed about any new potential functionality of the ADF based on software updates?

Outlook

- Gather feedback on D2.2 Draft and results from pilot application of draft CoP
- Incorporate feedback into final CoP AD
 - **D2.3 Code of Practice for the development of automated driving functions (2021)**
- Dissemination activities
- Provide support for easy application of CoP AD



Thank you for your kind attention.

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