



Higher Order Skills in traffic: the new “must haves” of driving training and testing

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Storyline

- Introduction
- Driver training and testing in NL: the latest news
- Higher Order Skills in traffic:
 - Where do we stand?
 - Where do we go?
- Higher Order Skills in a phased driver training
- Learning and testing methods for Higher Order Skills
- Conclusions



Road Safety expert @Royal HaskoningDHV

- Driver training and testing
- Smart mobility (vehicle-human-infrastructure)

Recent work:

- Improvement of quality of driver training
- New hazard perception theory exam
- Higher order skills in traffic for different groups of drivers
- National curriculum driver training category B





Driver training and testing in NL



From exam-oriented to development-oriented

From driving lessons to driving education

Collegiate Advisory Ride

RAPPORT
De Collegiale Adviesrit
Verslag van een pilot in de examenregio Goes
Klant: Ministerie van Infrastructuur en Waterstaat
Referentie: BI3484-RHD-ZZ-XX-RP-Z-0001
Status: S0/P01.01
Datum: 22 september 2022

RAPPORT
Hogere-ordevaardigheden (HOV) in het verkeer
Onderzoek naar internationale best practices voor het aanleren en testen van HOV bij verschillende bestuurderscategorieën
Klant: Ministerie Infrastructuur en Waterstaat
Referentie: BH5943-RHD-ZZ-XX-RP-Z-0001
Status: S0/P01.01
Datum: 6 september 2022

Higher Order Skills in traffic

National Curriculum Driver Training B

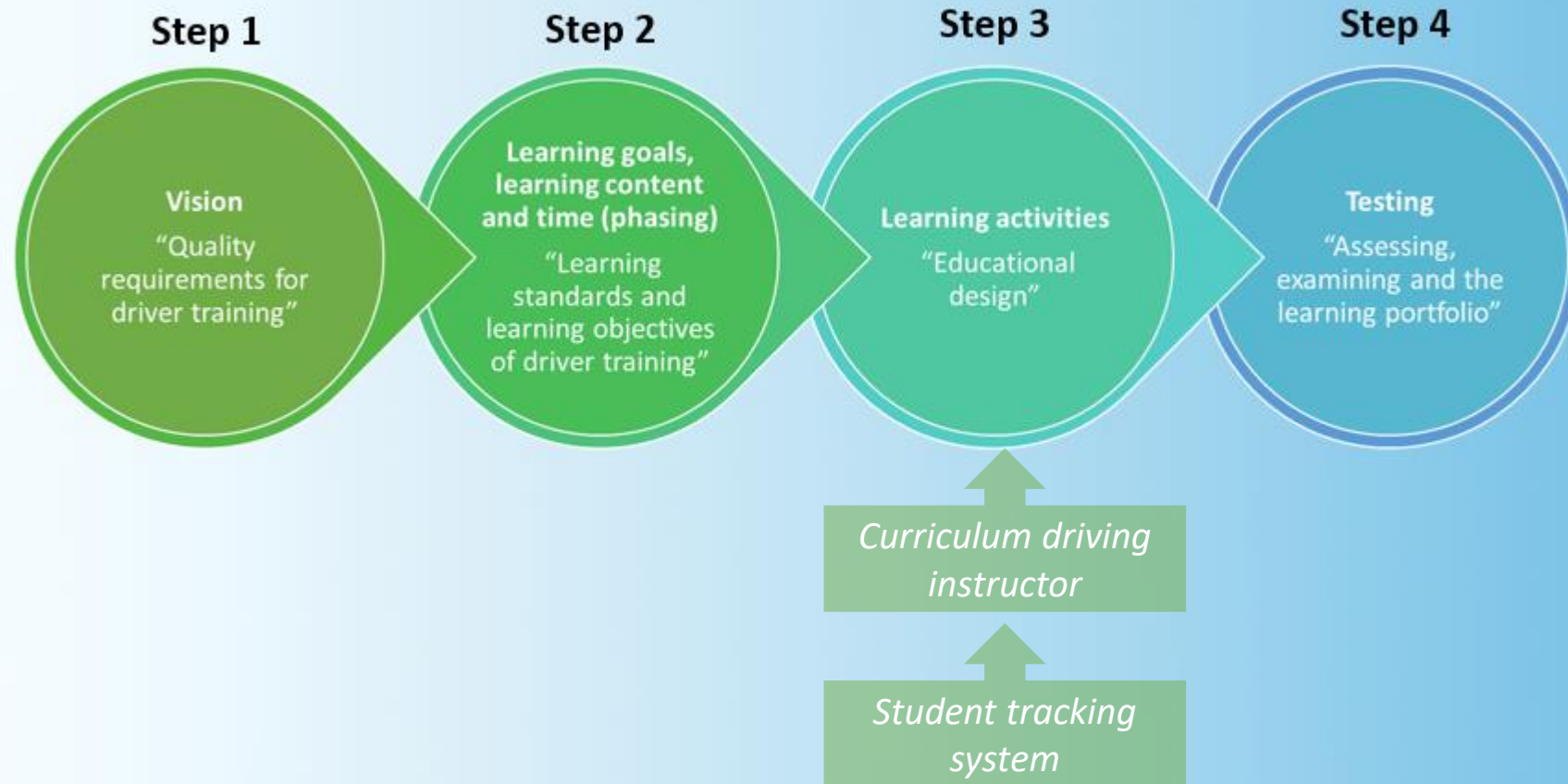
2020–2021

2021–2022

2022

2022–2023

Towards a complete training curriculum





HOS: A closer look

Hazard perception

The ability to **anticipate potentially dangerous situations** on the road ahead.

Calibration

The ability to **estimate your own ability or performance** in carrying out specific driving tasks under specific driving conditions.

Social-affective skills

The ability to **use moral reasoning for decision making** in different interactions with other road users.

HOS: Where do we stand?

	Knowledge and Skill	Risk Increasing Aspects	Self-Assessment
Goals for Life and Skills for Living	Understanding the importance of lifestyle, age group, culture, social circumstances, etc.	Understanding the importance of sensation-seeking, risk acceptance, group norms, peer pressure, etc.	Understanding the importance of introspection, competence, personal preconditions for safe driving, impulse control, etc.
Goals for, and Context of Driving	Understanding the importance of modal choice, time-of-day, motives for driving, route planning, etc.	Understanding the impact of alcohol, fatigue, low friction, rush hour traffic, peer-age passengers, etc.	Understanding the importance of personal motives, self-critical thinking, etc.
Driving in Traffic	Mastering traffic rules, hazard perception, etc. Automating elements of the driving process. Co-operating with other drivers, etc.	Understanding the risks associated with disobeying rules, close-following, low friction, vulnerable road users, etc.	Calibration of driving skills, developing a personal driving style, etc.
Vehicle Control	Mastering vehicle functioning, protective systems, vehicle control, etc. Understanding the impact of physical laws.	Understanding risks associated with non-use of seat belts, breakdown of vehicle systems, worn out tires, etc.	Calibration of car control skills



HOS: Where do we go?

	Basic Skills		Higher Order Skills		
	Know and understand (necessary underlying knowledge)	Decide and act (properly execute task processes)	Higher-order cognitive skills (situation awareness, hazard perception)	Calibration (realistic self-image of own skills)	Social-affective skills (showing empathy, impulse control, dealing with peer pressure)
Combine life-tasks and drive with a goal	Influence of personal characteristics, factors and circumstances on basic skills		Influence of personal characteristics, factors and circumstances on recognizing and dealing with risky situations	Influence of personal characteristics, factors and circumstances on the choice of situations to suit your own safety	Influence of personal characteristics, factors and circumstances on the perception of situations, feelings and interests of other road users
Prepare, plan and navigate	Consequences for the execution of basic skills of choices you make before entering traffic		Consequences for recognizing and dealing with risky situations of choices you make before entering traffic	Consequences for entering situations that may or may not suit your own ability of choices you make before entering traffic	Consequences for other road users of choices you make before entering traffic
Resolve situations-participate in traffic	Knowledge, insight and skills to safely resolve traffic situations: what are the rules and agreements and how do I apply them safely?		Knowledge, insight and skills to recognize traffic risks in time and then avoid them or prevent unsafe situations from arising	Know which traffic situations you can and cannot handle and choose your behavior in such a way that situations are manageable for you and can be solved safely	Know what the consequences can be for other road users if you do not resolve traffic situations according to agreements and make unsafe choices
Vehicle control and manoeuvres	Technical control of the vehicle		Knowing the risks you run if technical control is insufficient and knowing what to do to prevent these risks	Know how well you control the vehicle technically and choose situations in such a way that you can technically handle them	Knowing what the consequences can be for other road users if technical control is insufficient

Higher Order Skills in a phased training

Increasing complexity of traffic situations

Low-traffic environment



Simple environment



Complex environment



Most complex environment



Decreasing support of driving instructor

Increasing driving ability of student



End Phase 1



End Phase 2

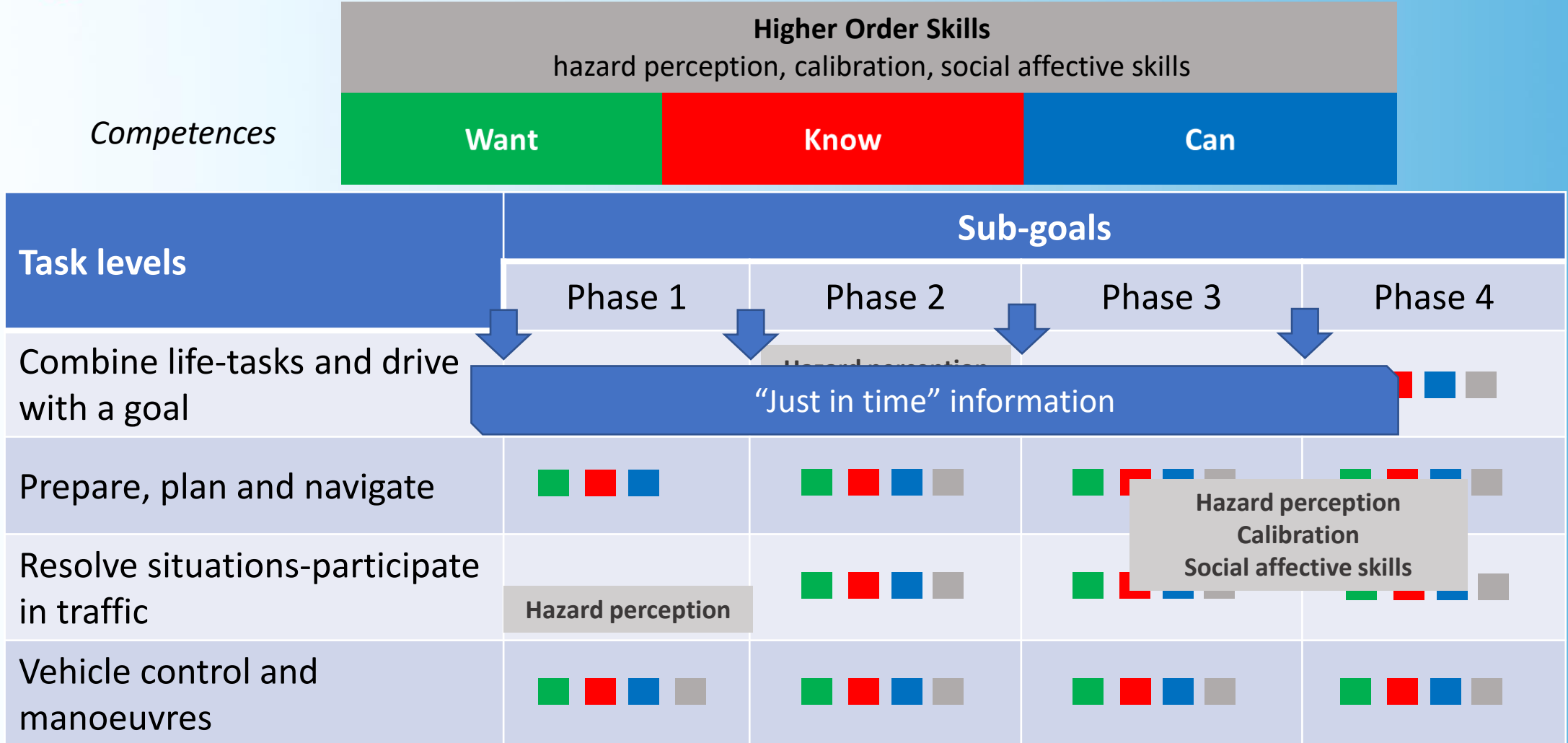


End Phase 3



End Phase 4

Higher Order Skills in a phased training



Training Higher Order Skills

Hazard perception

Theory
e.g. videos and simulator

Practical driving
Experienced situation
analysis

Calibration

Group discussion

Practical driving
Experienced situation
analysis

Social affective skills

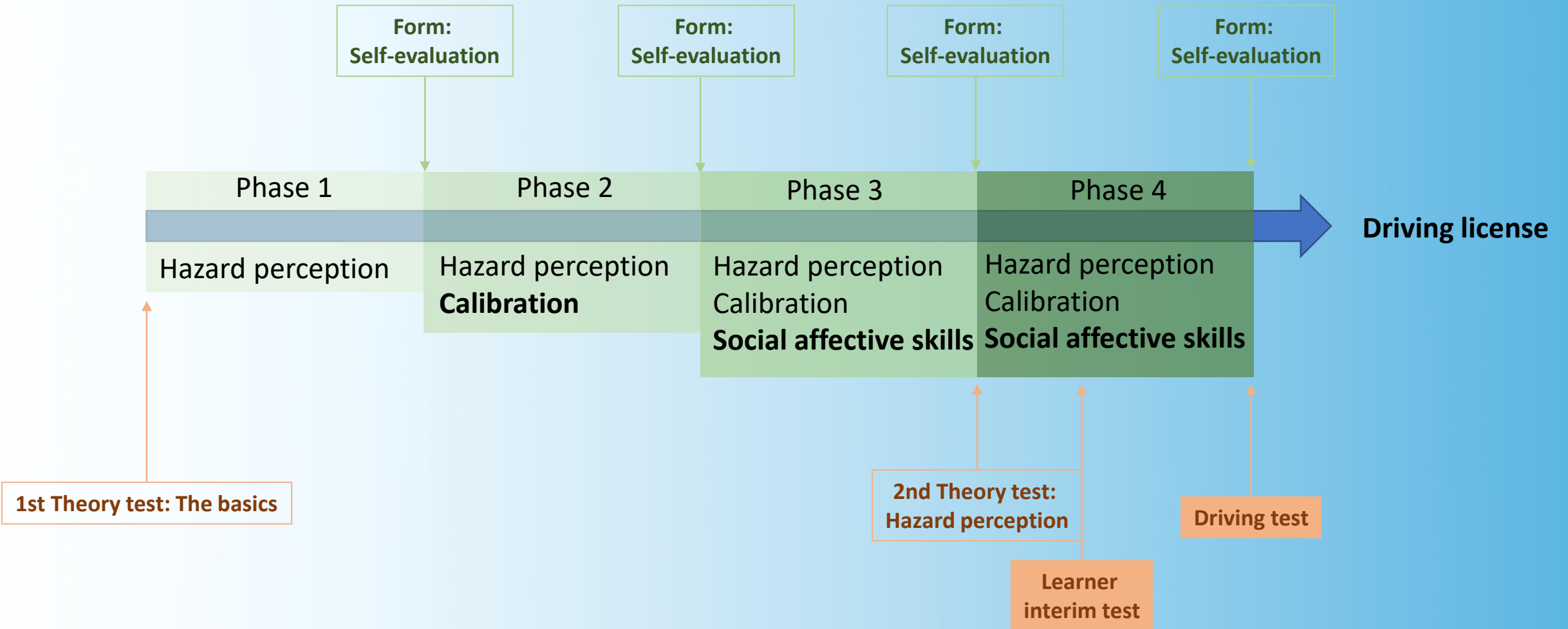
Group discussion

Practical driving
Experienced situation
analysis

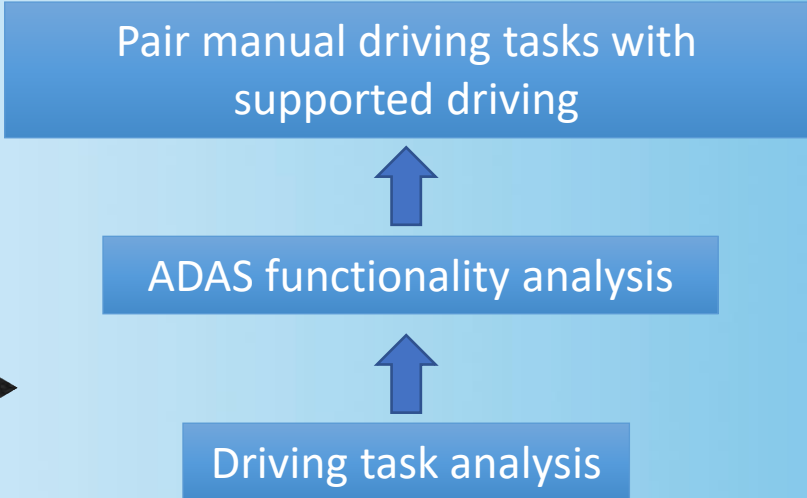
Driving with peers

higher-order instruction skills

Testing Higher Order Skills



ADAS: part of HOS?



Theory

Functionality - Expectations - Limitations

Practice – just in time learning



Conclusions

- HOS can be effectively developed in phases.
- Applying appropriate learning methods for each skill can lead to better outcomes.
- Adequately preparing driving instructors for teaching HOS can improve the effectiveness of training.
- While calibration and social affective skills may be challenging to test, they can still be trained and improved with proper methods.
- ADAS can be trained and tested in both theory and practice.



Thank you!



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