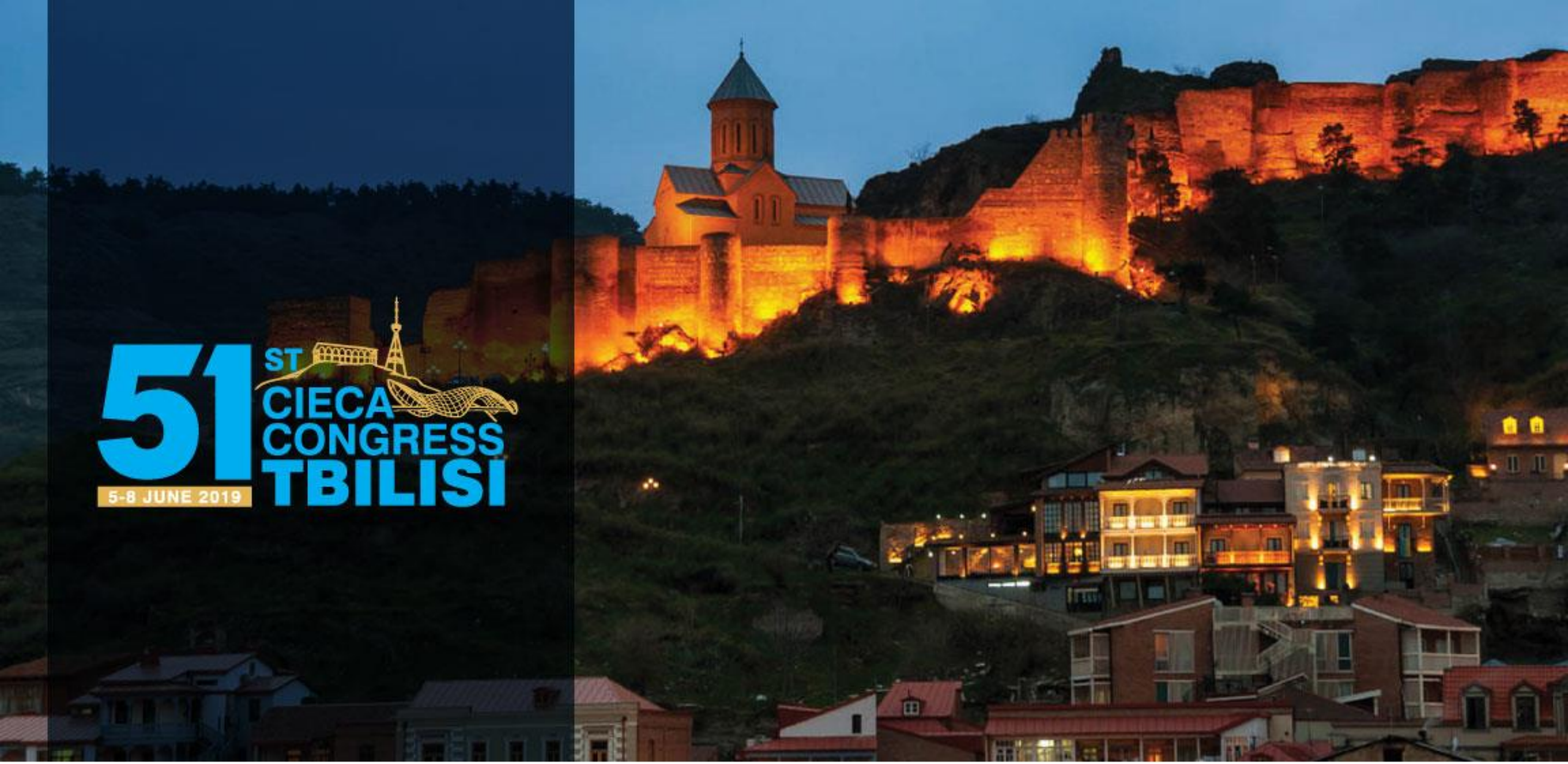

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The International Commission for Driver Testing

Modern Technology for Safe Driving

The Swedish approach to modern technology in driver´s education and testing

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Overview

- Introduction
- What we should focus on right now
- What we are doing now, and what we can do in the near future regarding:
  - driver training
  - driving tests
- Examples of challenges in the near future

Introduction

- Self-driving vehicles are coming (probably not in the way many believe)
- It´s a long way to go, before self driving cars can be realized on the open market
- Ordinary passenger cars will gradually become more and more automated, and able to drive themselves in specific areas, in good conditions
- The hype of self-driving vehicles, has held back the debate on driver support systems (ADAS)
- We should talk about what different ADAS- functions can handle, and not what SAE-level they belong to

What we should focus on right now

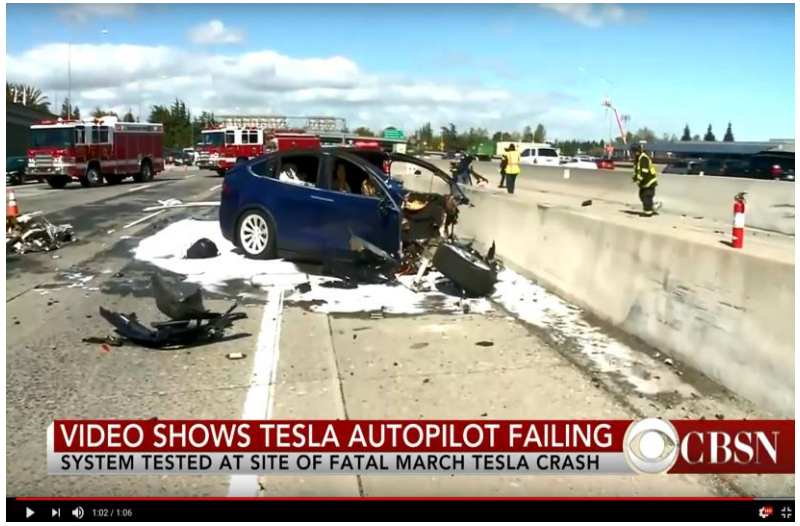
- We have until now talked a lot about what will happen in the future,
  - but now we need to start from what´s here and now.

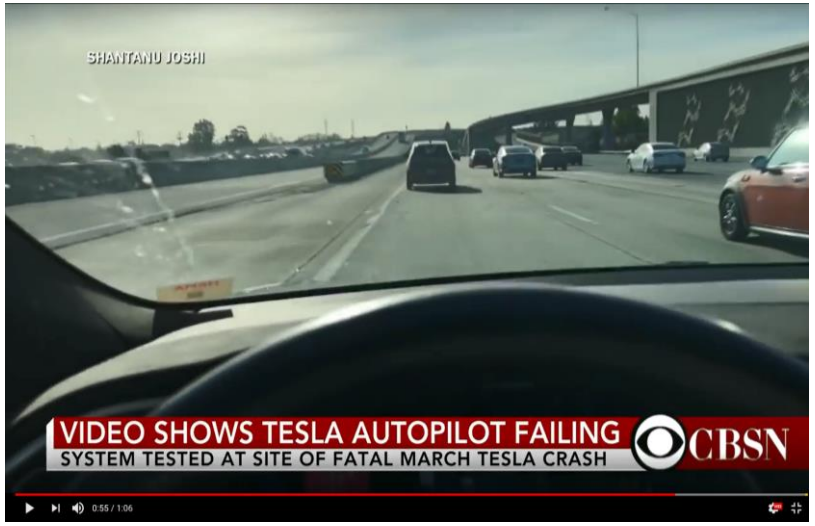
- It´s better to first focus more on the oncoming advanced driver-assistance systems, and talk less about self-driving cars.

  - Focus on ADAS (especially those who can do parts of the dynamic driving task)

What we should focus on right now

- It´s most important to inform about the systems' limitations and new risks that arise





- ADAS will come in cheaper cars, and people will use it….
- We must ensure that ADAS is involved in driver training and in the test

Examples of challenges in driver training?

- Many want´s, and also choose to be available at all times
  -I know it's dangerous, but I check the cell phone anyway when I drive“
- We can point out that you should do this or that, introduce more rules, add more responsibilities etc. But…
- It is about human beings, it´s difficult to control behavior, humans can decide themselves regardless of rules...
- It is important to get them to understand that, if you shall use this systems - do it in a responsible way, do it in appropriate places…

Simplified view of the Swedish system for drivers education and examination, category B 2019

Lessons in driving Schools and/or Private accompanied driving (3 hour mandatory introduction course)

Mandatory risk-education part 1 (3 hour Theory)

Mandatory risk-education part 2 (3 hour practical)

Theory test

Practical test

2 year on trial

Examples of current sub-goals in curriculum of the mandatory risk education

Theoretical sub goal

The learner should have knowledge of:

- the importance of different technical support systems for safety, and how the systems can influence the driver's behavior

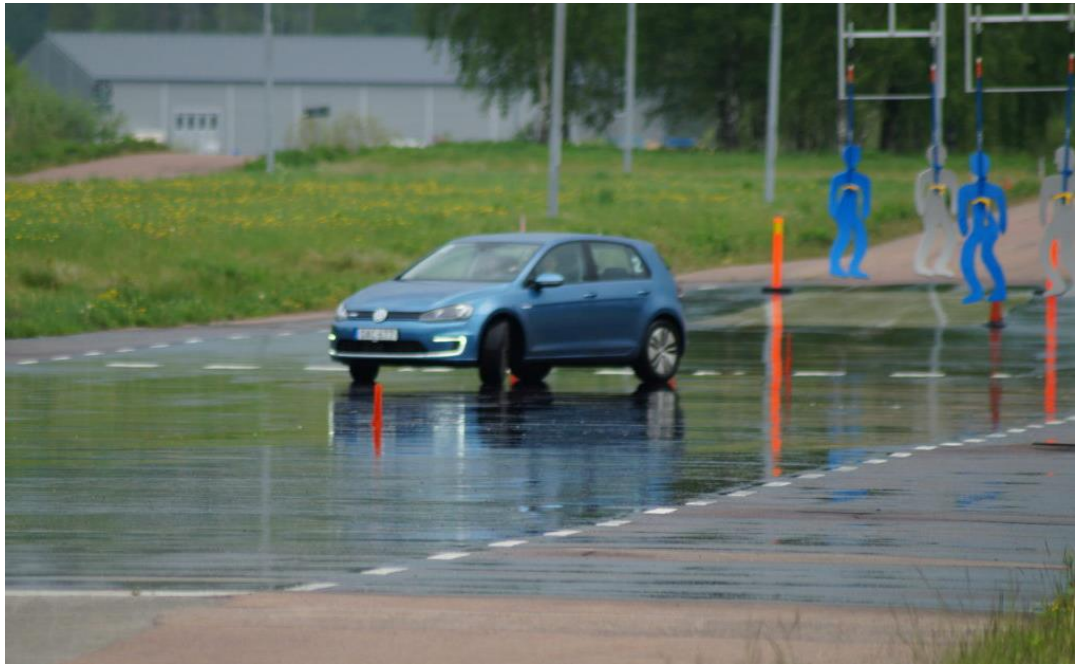
Practical sub goal

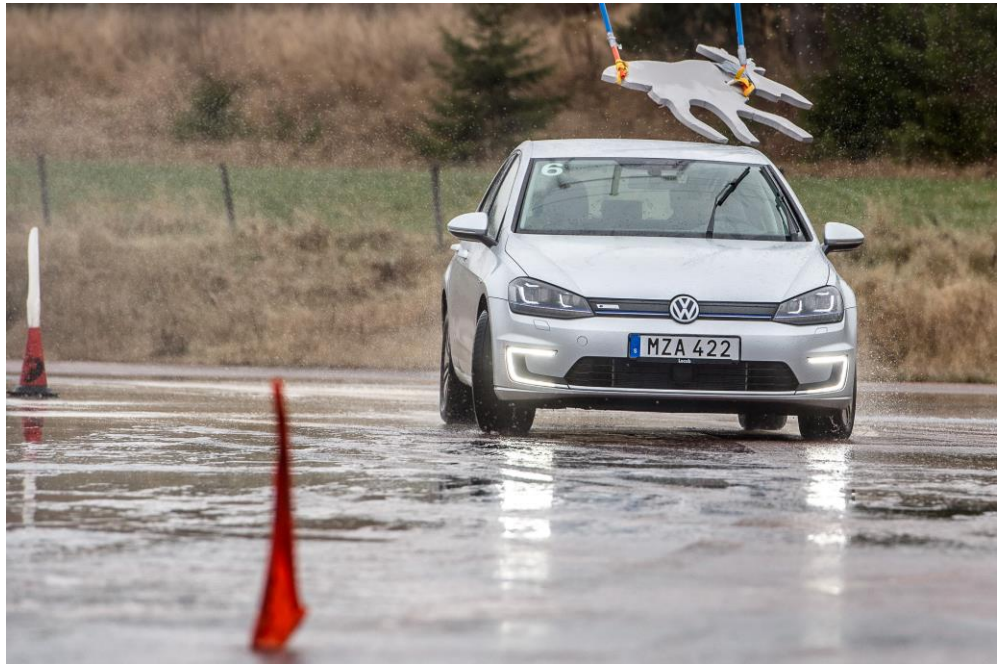
The learner shall experience and realize:

- advantages, limitations and risks with different technical support systems

Examples of some strategic principles in the practical risk education

- Based on common accidents
- Work with the causes of the accidents
- Show consequences of the accidents
- Focus should be on avoiding emergency situations, more than managing them
- The practical exercises must be such that the learner gets the experiences and discussions that allows him to make his own conclusions,
  - conclusions which are needed to achieve different sub-goals in the curriculum
- Important to experience failure caused by increased speed or distraction
  - The student must fail to avoid becoming over confident
- Coaching instead of teaching to succeed

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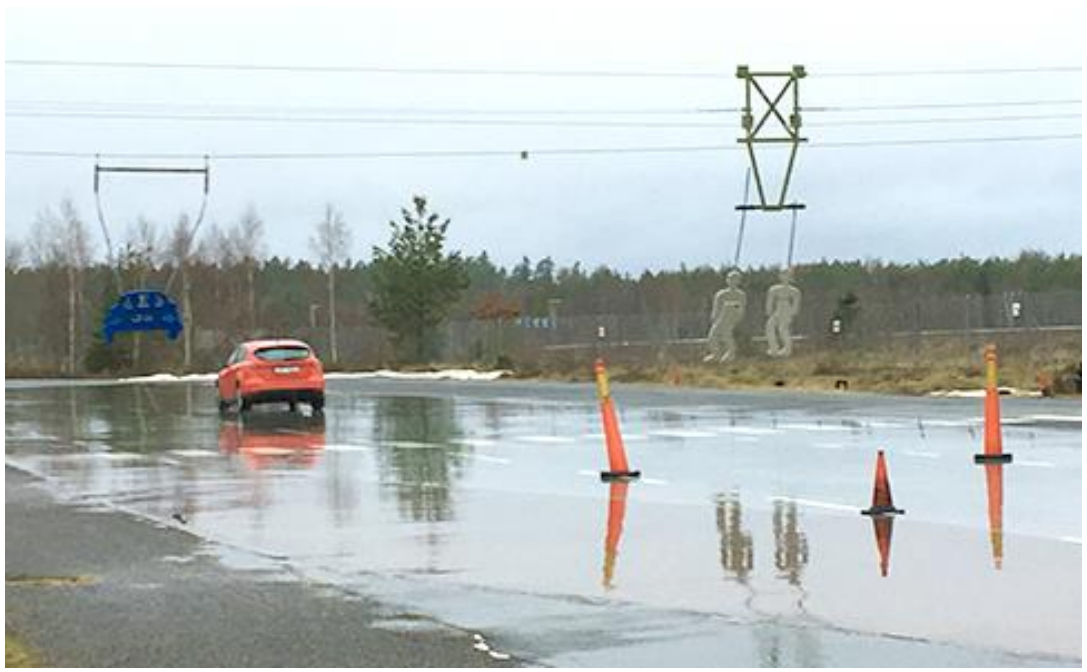
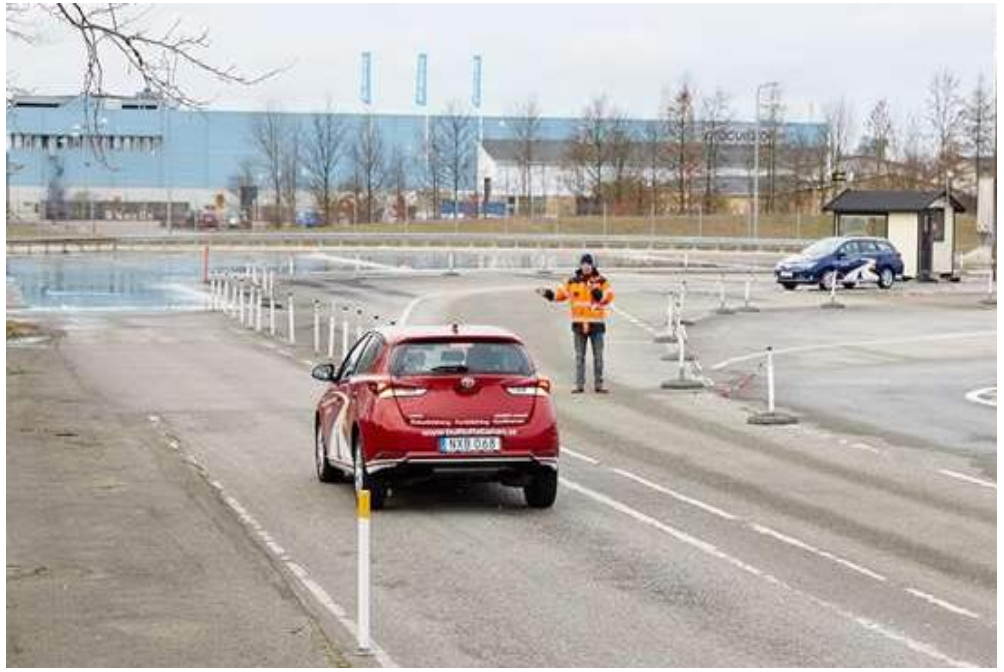




Examples of what we can do in the mandatory risk education, in the near future

- Provide knowledge about what the systems can do, and **what they can´t do** (the ADAS systems limitations)
- Develop exercises with the aim of reducing the risk of over faith on the systems' capacity
- Create specific **motivational exercises** aimed to get them to understand to use this systems in a responsible way in appropriate places
- E.g. let them **experience**:
  - what can happen when using Adaptive Cruise Control combined with auto steering functions if a critical situation arises.
  - what happens when lane markings suddenly disappears in a curve or roadwork
  - limitations on slippery road conditions etc.

Possible content in risk education when these systems become more common

We can develop exercises to let the learners experience:

- failures caused by lack of situational awareness,
- difficulties with situational recovery and emergency responding

Challenge in the near future

- To get enough time for the risk education
- To ensure the teachers competence

(We have good possibilities because we have introduced mandatory yearly further education for the teachers)

What we are doing now and we can do in the near future regarding the Theory test

- Knowledge about different technical support systems can be measured in the theoretical test (e.g. advantages, limitations and risks)

- What´s being tested, will be included in the education.
  "- What we test is what we get"

- The challenge is to construct relevant questions based on facts

- We will construct questions and put them in the theory test as soon as the different systems become more common on the market

What we are doing now and we can do in the near future regarding the driving test

- We do not want to hinder the use and the development of new technology or new equipment

- We have only one rule for this issue in the regulations for driving tests:

§ *The examiner may decide that the use of technical support systems in the vehicle shall be limited, if it´s necessary for any part of the assessment in the driving test.*

What does the rule mean?

- It's ok to use all assistance systems, (e.g. Adaptive Cruise Control and Lane keep Assist)
- **but** the examiner can require that the candidate must be able to drive manual as well - the **examiner decides** what he or she need to see at each test
- It´s a simple rule that lasts over time
- Easy to adapt to developments of new and still unknown technology
- Note: The use of ADAS can also lead to a failed driving test.
  E.g. Auto Emergency Braking (AEB) during driving

Challenges and possible content in future driving test

- Vehicles used in the test should be representative for most of the cars

When a larger proportion of the vehicle fleet has ADAS (note: we are not there yet):

- Then we can implement some parts as mandatory to use in the driving test
  E.g. we could require use of Adaptive Cruise Control or “Highway pilot”.
  - as a first step if it´s present in the car

A bit further ahead in the future:

- the examiner might tell the candidate to hand over the driving task to the vehicles system when entering a highway or a rural road. And later take back control over the driving again if the system asks for it, or to exit the highway.
- Distracting tasks can also be included
- As a result it would be trained before the test

Examples of other challenges in the near future

- Keep examiners updated and competent enough to cope with new technologies and difficulties that arise
  - We have possibilities in the periodic training (set in the DLD)
- We need to create harmonized international regulations including "self-driving" functions
  - The rules should be general formulated and not detailed, in order to last a long time.
  - As ADAS constantly develops, detailed rules quickly can be out of date
- How do we reach consumers who already holds a driving license and give them information about the systems limitations?

Summary

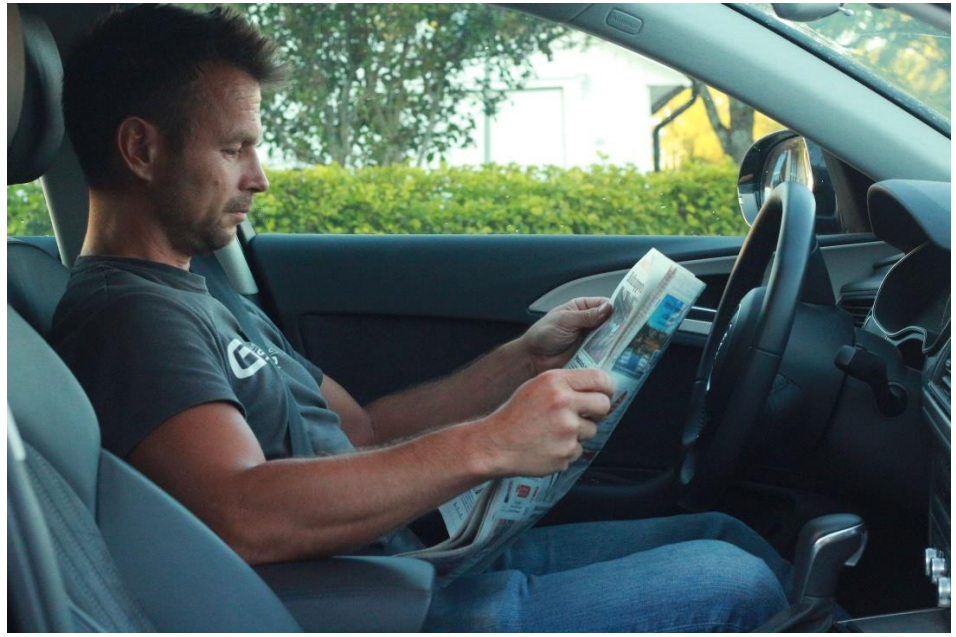
✓Introduction

✓What we should focus on right now

✓What we are doing now, and what we can do in the near future regarding:

- driver training
- driving tests

✓Examples of challenges in the near future



Dank
Merci
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Gracias
Danke
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Díky
Tak

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Buidheachas
Vďaka
Aitäh
Diolch

Kiitos
Takk
Go raibh maith agat
Bhuíochas
Grazie
感謝
Mulțumesc
Спасибо
Хвала
Tack

Thank you for you attention!

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