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CONGRESS**
DRESDEN 2026

Training app for Efficiency and Safety Training Measures in real road traffic analysing real-time telematics data (TrainE- SMart)

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Mission



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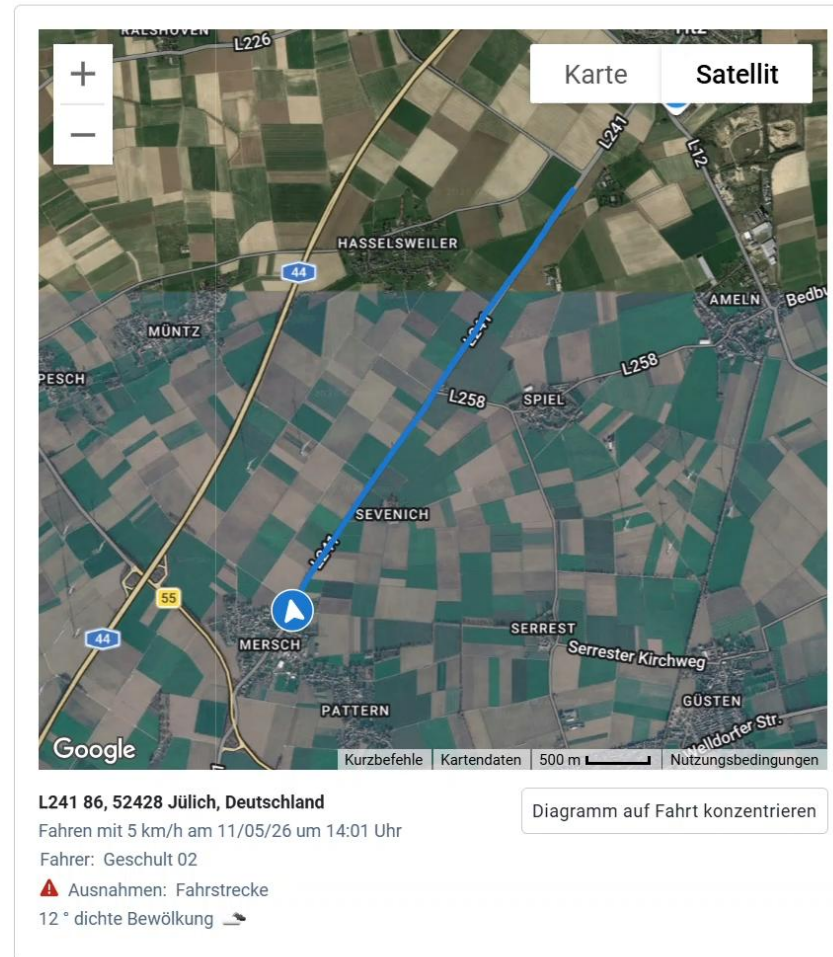
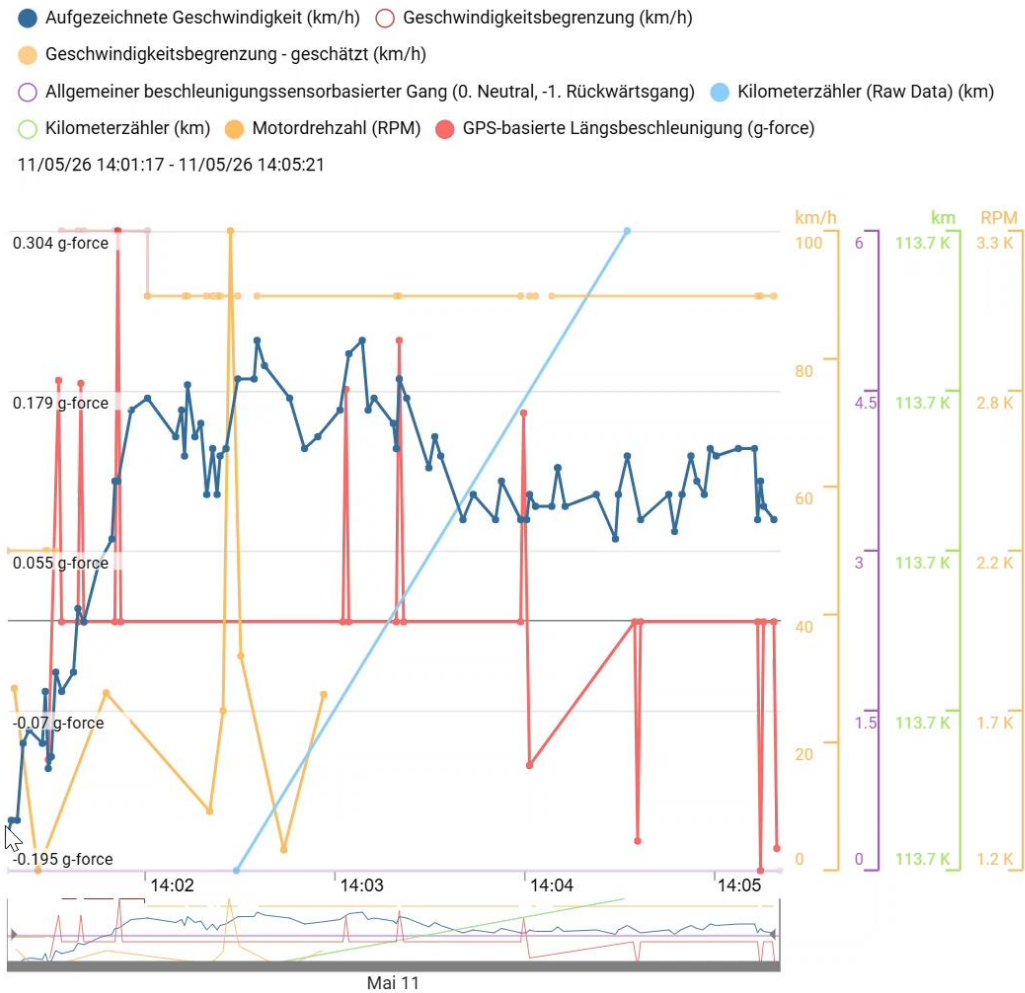


Mission

unsafe



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Mission

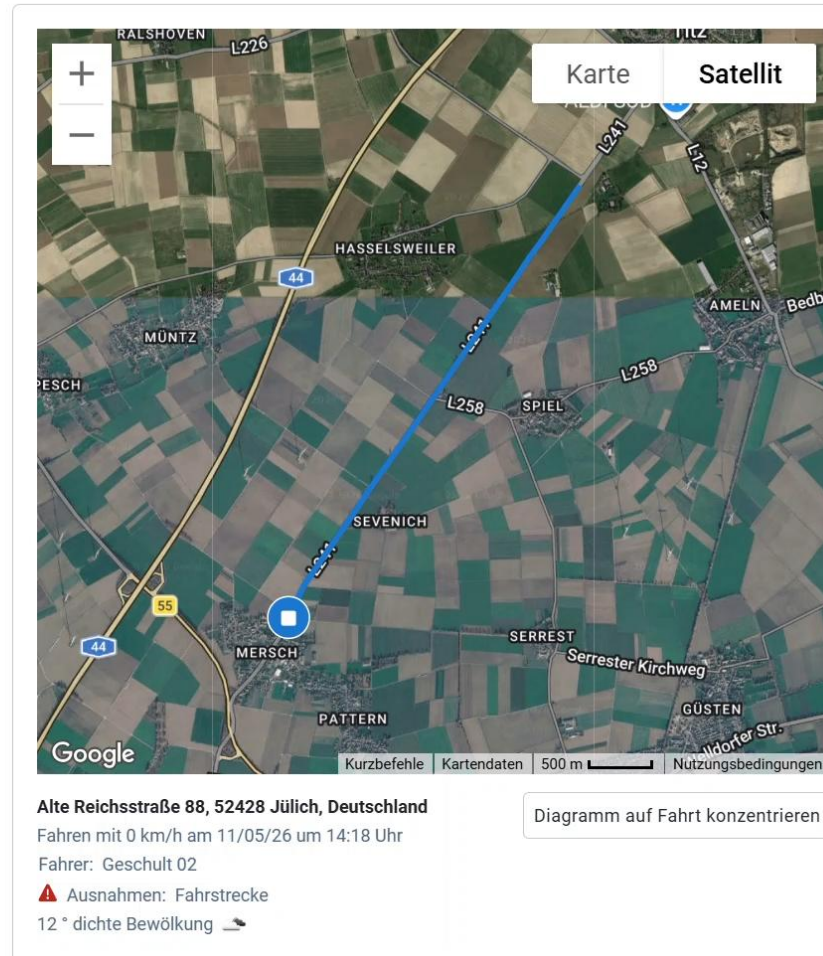


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safe

- Aufgezeichnete Geschwindigkeit (km/h) ○ Geschwindigkeitsbegrenzung (km/h)
- Geschwindigkeitsbegrenzung - geschätzt (km/h) ● Beschleunigung von Seite zu Seite (g-force)
- Allgemeiner beschleunigungssensorbasierter Gang (0. Neutral, -1. Rückwärtsgang) ○ Kilometerzähler (Raw Data) (km)
- Kilometerzähler (km) ● Motordrehzahl (RPM) ● GPS-basierte Längsbeschleunigung (g-force)
- Beschleunigung in Vorwärtsrichtung oder Bremsen (g-force)

11/05/26 14:18:17 - 11/05/26 14:21:59



Mission

Development of a tool for assessing the safe performance of driving tasks based on telemetry data:

- **improve efficiency**
- **achieve cost savings**
- **increase in safety resulting from a training programme**
- **visible and quantifiable the associated behavioural changes**



Motivation

Give feedback on a participant's driving style as objectively as possible.

- **Focus on safety within the three pillars of sustainable mobility**
- **Data-based**
- **Supported by experts**



Background



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Germany has an official catalog of driving tasks for the practical driving examination.

- 8 driving tasks
- 5 observation categories



Driving tasks/observation categories

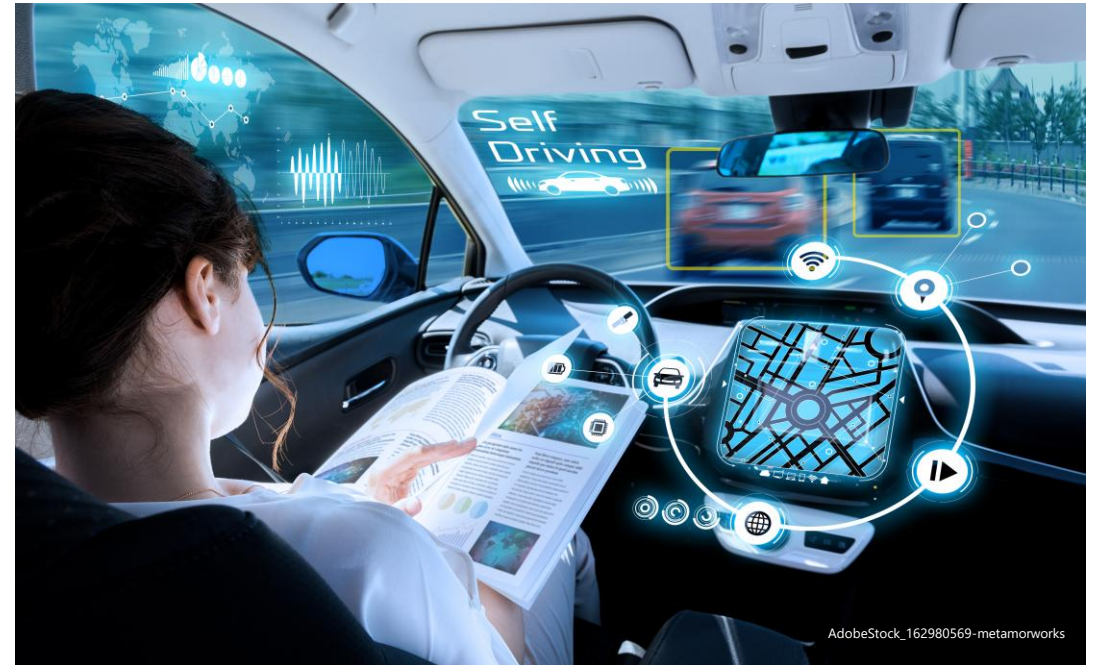


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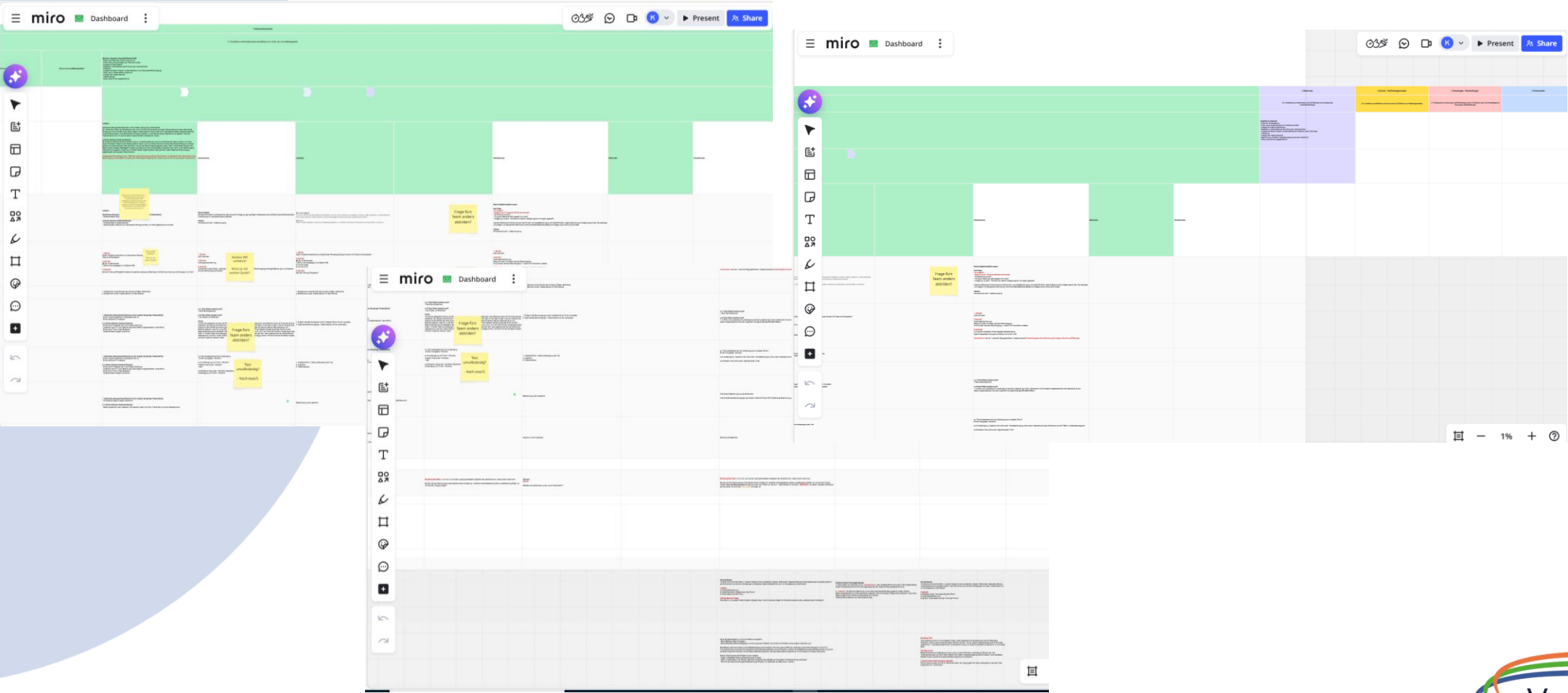
	traffic observation	vehicle positioning	speed adaptation	communication	vehicle control, environment-aware driving
changing lanes, joining/leaving traffic	Time for overtaking-manouver Traffic sign recognition Vehicle speed Acceleration/decaleration Camera to monitor mirror observation Blind spot assistent	Lane assistent Safety distance (camera based) Forward Collision warning Steering angel Lateral acceleration	Longitudal Acceleration/Decaleration Recuparation accelerator pedal position	Indicator	RPM Fuel/Energy consumption Recuparation
curves					
overtaking, passing					
junction, cross roads					
roundabout					
rail-borne vehicles					
bus stop, pedestrian crossing					
drive straight ahead					

Research question

Which telemetry data provide information on whether driving tasks are being carried out safely?



Complexity: driving task and data



The image displays three overlapping screenshots of a Miro dashboard, illustrating a complex task and data visualization. The dashboard is titled "miro Dashboard" and features a grid layout with various colored cells (green, purple, yellow, red, blue, grey) and text blocks. The top navigation bar includes icons for search, chat, and presentation, along with a "Present" button and a "Share" link. The main content area is divided into several sections, each containing detailed text and data points. The overlapping nature of the screenshots highlights the depth and complexity of the information presented.

Blind spots

**Only interpreting telemetry data
can lead to incorrect conclusions.**

- **Camera systems**
- **Trainer feedback**



Driving task „overtaking“



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Overtaking – General

(Appendix BAST Report M243)

- Check whether overtaking is permitted and appropriate (0)
- Check whether traffic conditions allow overtaking (0)
- Indicate intention to overtake (1)
- Observe and assess the traffic situation (1-1b)
- Pull out to overtake (2)
- Adjust speed and following distance before and during the overtaking maneuver (2-5)
- Check whether it is safe to merge back in (5)
- Indicate intention to merge back in (5)
- Merge back in (6-7)
- Check that the direction indicator is switched off (8)

Driving Tasks

Lane Change/Overtaking

Rural Road

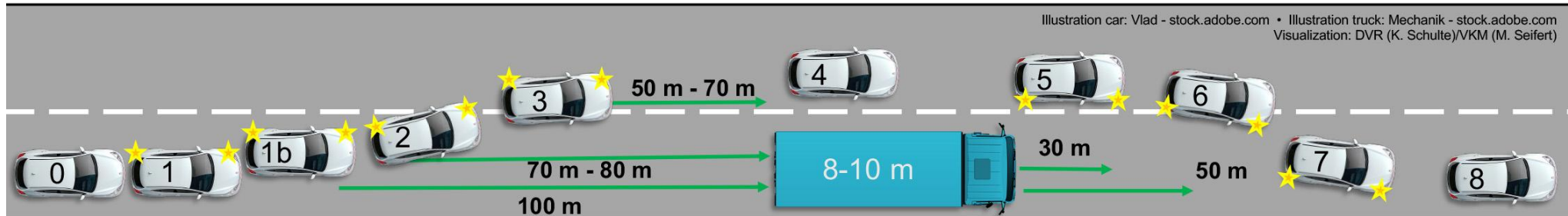
100 km/h vs. 60 km/h

Distance/Time 337,50 m/12,2 seconds¹

¹Assumptions

Acceleration from 60 to 100 km/h = 69 m + safety distance 54 m

(mid-size passenger car: 3-7 m/s² – tests indicate 3.39-3.7 m/s², assumed 3.58 m/s², duration: 3.1 s)



0

Approaching the traffic situation

- Perception and Assessment
- Adjusting Speed

1

Preparation

- Mirror check (IE)
- Check blindspot (sideview left)
- Indicator left

1b

Staggered Driving

- Indicator left

2

Pull-out

- Indicator left
- Smooth steering
- Acceleration

3

Start of the overtaking maneuver (overtaking distance)

- Indicator left
- Smooth steering in opposite direction
- Acceleration completed

4

Straight-line driving ca. 300 m/10,8 sec (4-6)

- No indicator
- Lane keeping assist not active
- No lateral acceleration

5

Preparing for merging back in the lane

- Indicator right
- Rear-view mirror observation
- Mirror check (IE-Rule)
- Check blindspot right

6

Merging back in the lane

- Indicator right
- Smooth steering right

7

Completion of merging back in the lane (end of overtaking distance)

- Indicator right
- Smooth steering in opposite direction

8

Straight-line driving

- Final safety check
- No indicator

Driving task „overtaking“



Driving task „overtaking“

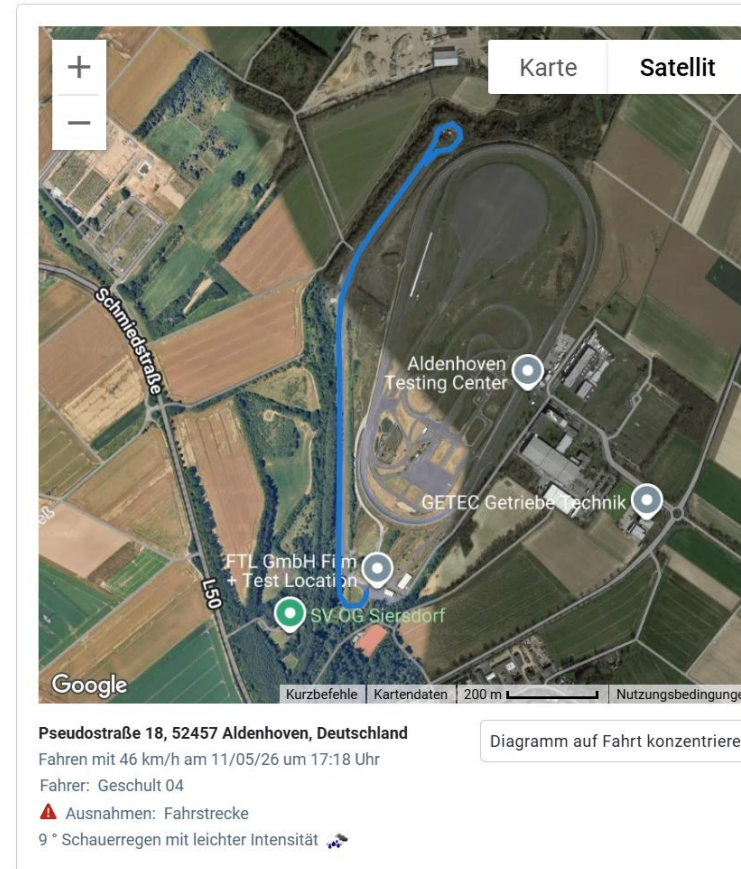
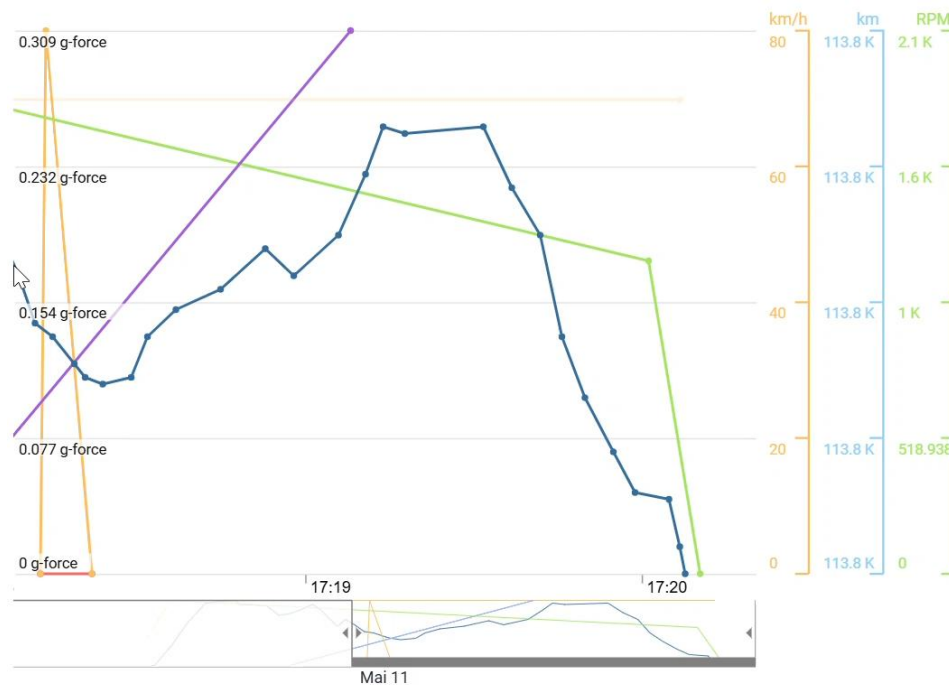
Motordatenprofil KIA

80:60 km/h

Zurück Filter Berichte

- Aufgezeichnete Geschwindigkeit (km/h)
- Geschwindigkeitsbegrenzung - geschätzt (km/h)
- Kilometerzähler (Raw Data) (km)
- Kilometerzähler (km)
- Motordrehzahl (RPM)
- Beschleunigung von Seite zu Seite (g-force)
- Beschleunigung in Vorwärtsrichtung oder Bremsen (g-force)

11/05/26 17:18:08 - 11/05/26 17:20:21



Driving task „overtaking“



unsafe

telematic data

video data

Driving task „overtaking“



unsafe
telematic data
video data

Driving task „overtaking“



KIA_20260511_053827_CET_Ausweichen_Gyroscope

KIA_20260511_053827_CET_Ausweichen_GeoLocation

KIA_20260511_053827_CET_Ausweichen_CANBus

KIA_20260511_053827_CET_Ausweichen_Accelerometer

telematic data

+ video data

+ trainer

Based on the data, it is determined what constitutes a safe or unsafe driving manoeuvre.

Outlook / Perspective

- **Definition for every driving task**
- **Mobile app**
- **Data collection via OBD interface**
- **Fixed installation**



Remember

Development of a tool for assessing the safe performance of driving tasks based on telemetry data.

The aim is not only to improve efficiency and achieve cost savings, but also to make the increase in safety resulting from a training programme and the associated behavioural changes visible and quantifiable.



Fotos: DVR/KM

Behind the scenes



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