



Gerhard Greiner

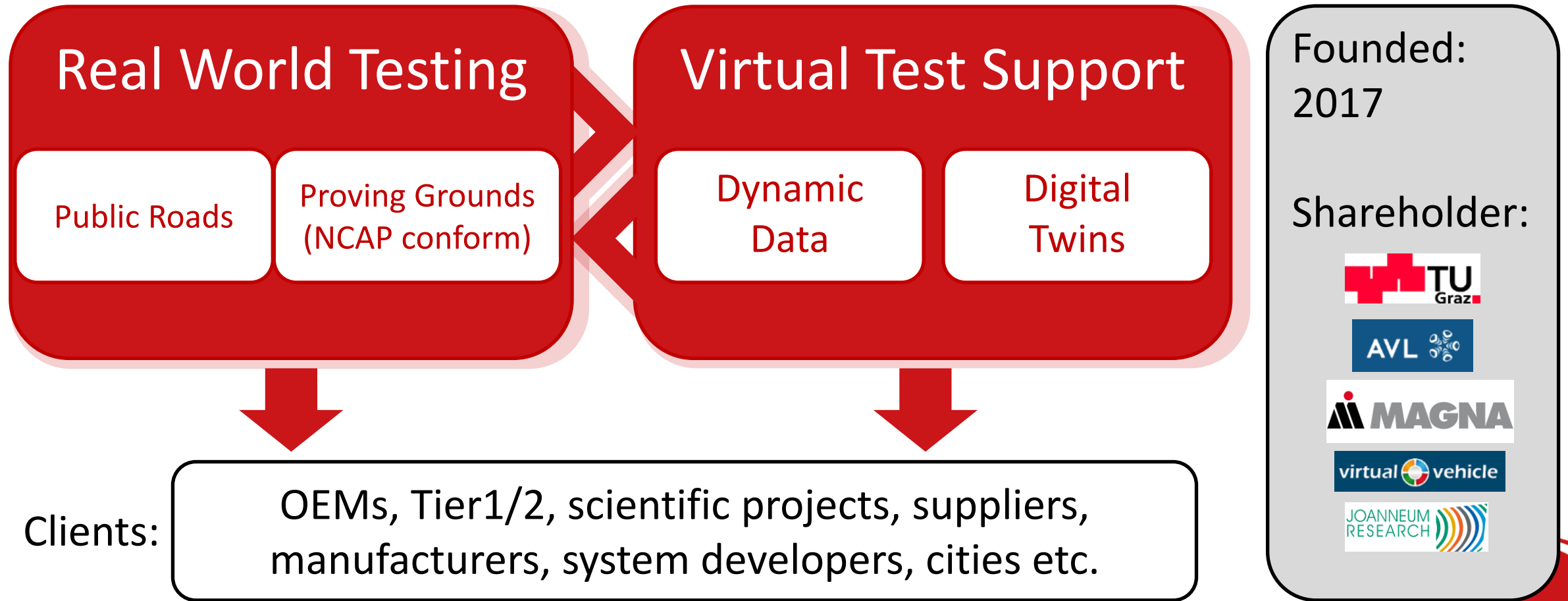
9 December 2021 - 15 December 2021
Virtual, Austria

International Mobility Days
2021 #imdays2021

On the Way to Self Driving Vehicles

Testing ADAS/AD Functions and
Traffic Monitoring as Input for
Virtual Testing

Innovation Lab: Austria's Test Region for Automated Driving



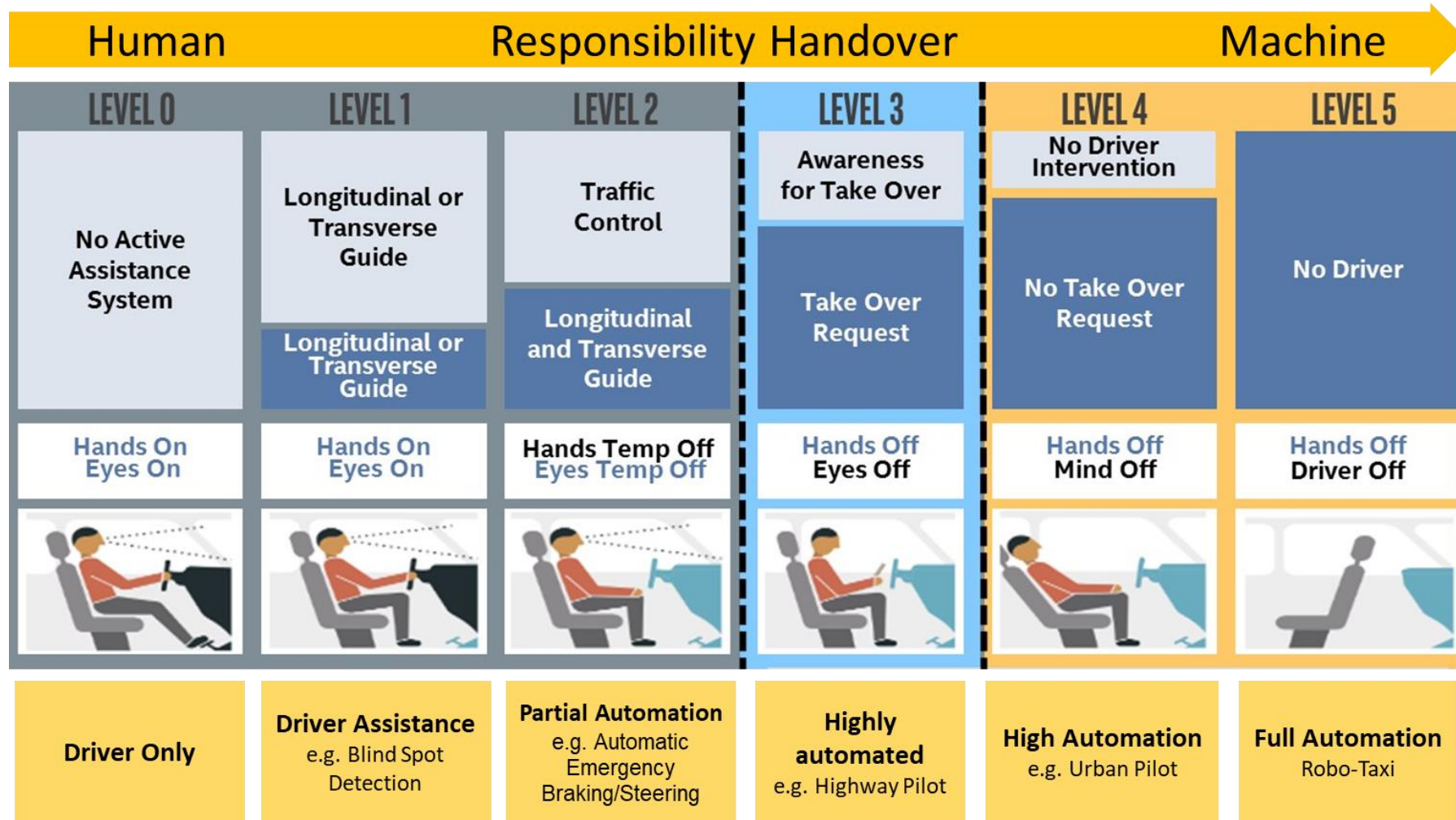


**DAS AUTO IST
JETZT VOLLKOMMEN:
ES BEDARF KEINER
VERBESSERUNG MEHR.**

Allgemeine Automobil-Zeitung, Berlin 1921

**100 years ago but now
we want more ...**

Society of Automotive Engineers (SAE) defines 6 levels of Automization



<https://iqglobal.intel.com/iq-content-library/wp-content/uploads/sites/18/2016/08/Levels-of-AD.jpg>

How to measure Safety?

NCAP – New Car Assessment Programm (“5 Star” Rating)




The Official Site of
The European New Car Assessment Programme




LATEST SAFETY RATINGS

NEW



2021 ★ ★ ★ ★ ★


Audi Q4 e-tron
Standard safety equipment



ADULT OCCUPANT		CHILD OCCUPANT	
	88%		89%
VULNERABLE ROAD USERS		SAFETY ASSIST	
	84%		95%


2021 ★ ★ ★ ★ ★

Subaru Outback
Standard safety equipment



2021 ★ ★ ★ ★ ☆

Renault Kangoo
Standard safety equipment



NCAP conform: ADAS/AD testing services



e.g. Autonomous Emergency Braking (AEB)



ALP.Lab, Flughafen Rijeka

Steering- and Pedalrobots for ADAS/NCAP Testing on Proving Grounds



Real World
Testing

EuroNCAP Proving Ground in Austria¹



Ad 1) In development.
Start 2022.

How to learn „real traffic“?

Dynamic data: Use case „Training data for AI“

We collect 7 Mio km real traffic data/year using infrastructure based traffic monitoring systems:

- New method - awarded with the Tech.AD Europe Award 2021 (Cheaper and more sustainable than with common car fleets)
- Training data for ADAS/AD systems from LiDAR, radar and optical sensors
- Data available in Bird view and Ego view perspective
- Different formats (CSV, GPX, OSI, OpenSCENARIO, MDF, MF4 etc.)



**TECH.AD
AWARD
WINNER**



Click or Scan

From Bird View to Ego View

Using algorithms, we are able to watch critical scenarios from different perspectives

Bird View



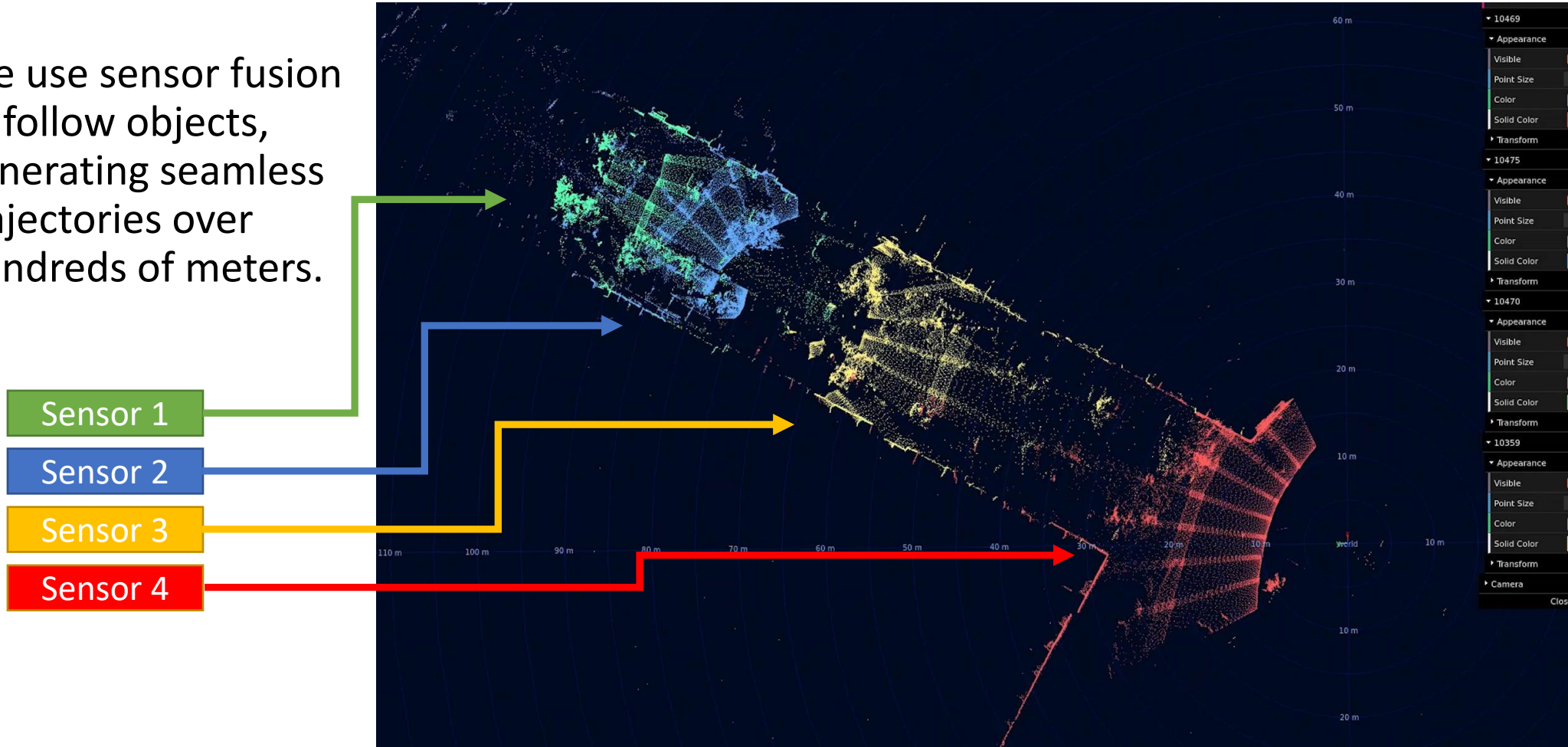
Ego View



First results Visualisation and data transformation.

Dynamic data: Real traffic monitoring data

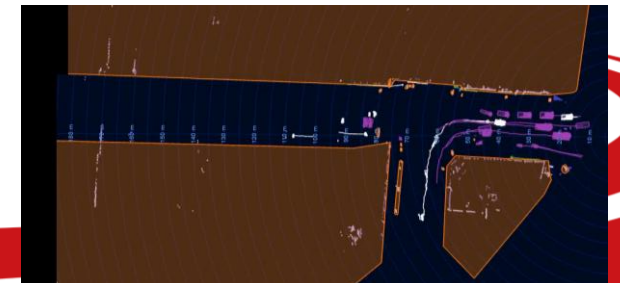
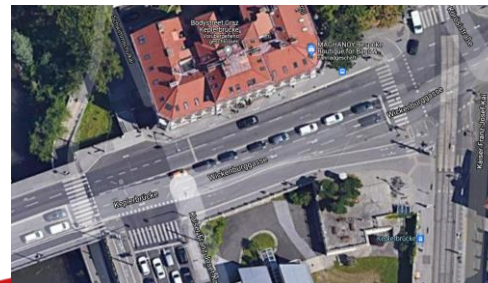
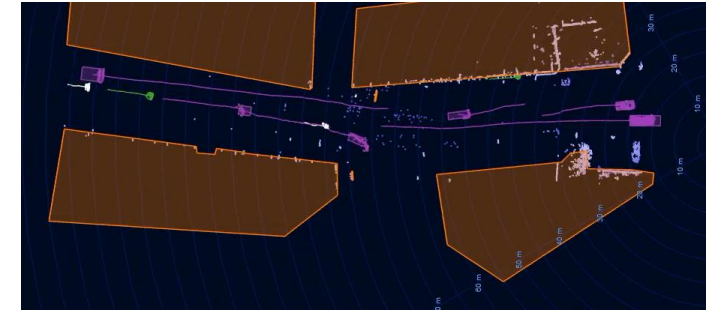
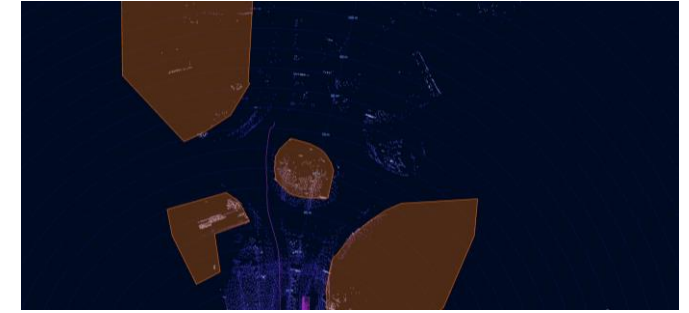
We use sensor fusion to follow objects, generating seamless trajectories over hundreds of meters.



Traffic Monitoring

Urban/rural lamp pose set-ups using LiDAR sensors (incl. weather data) for real traffic object tracking:

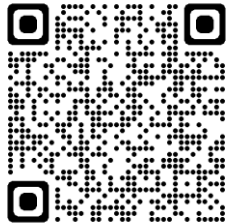
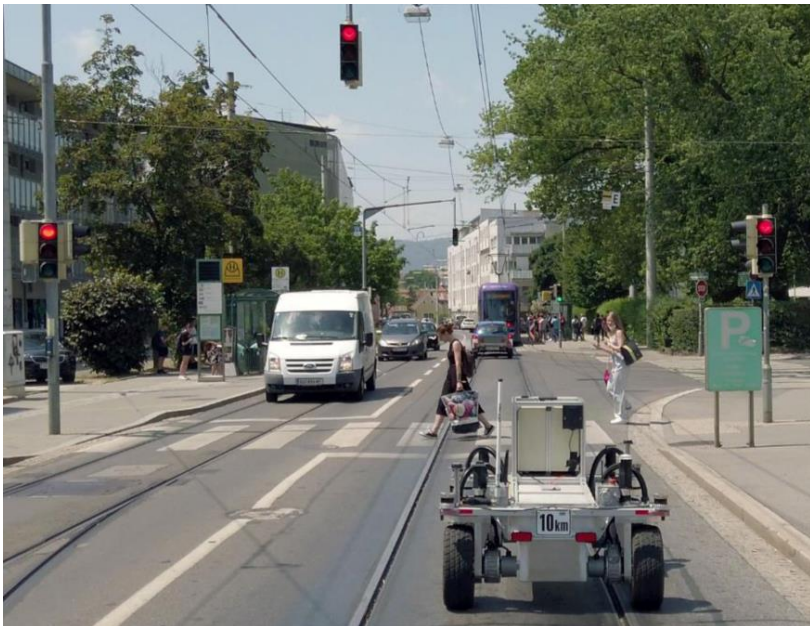
- City roundabout in Salzburg region – Lungau;
 - data available 24/7 since May 2021
 - + 8 month of data already available
 - + data subscription for 24/7 data stream possible
- City intersection in Styria – Feldbach;
 - data available 24/7 since December 2020
 - + 1 year of data already available
 - + data subscription for 24/7 data stream possible
- City intersection in Styria – Graz;
 - data available 24/7 since March 2020
 - + 10 month of data already available
 - + data subscription for 24/7 data stream possible



Mobile HiL Platform - SPIDER

We offer a unique autonomous platform for verification and validation of sensor systems, vehicle software and control algorithms.

- Target vehicle imitation (max. speed: 50 km/h)
- Precise repetition of test scenarios (4-wheel-drive)
- Road legal



Click or Scan



Smart Physical Demonstration and Evaluation Robot

Development of tailor-made test scenarios.

- Risk assessment and test concept development
- Identification of edge cases and critical test scenarios

Summary

- Vehicles with **sensors enable** a step-by-step improvement of **Level 2+ ADAS functions** up to **Level 4/5** in **defined** (restricted) areas
- **Roadside sensors and CCAM** (Cooperative connected Automated Mobility) support automated driving and **are becoming an integral part of the traffic infrastructure**
- **Regulatory and legal requirements** will be adapted over the next few years and **enable semi-autonomous driving**



More than 400 km public road digitized, available as Ultra HD map for simulation,
23 km highway equipped with sensors, detectors and C-ITS road-side units.
Trilateral cross border cooperation with Hungary and Slovenia



 Federal Ministry
Republic of Austria
Climate Action, Environment,
Energy, Mobility,
Innovation and Technology



Austrian Light Vehicle Proving Region for Automated Driving

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- **Urban/rural lamp pose set-ups:**
- 10+ locations available in Austria, multiple locations in German cities available on request;
- The ALP.Lab TM-System is very flexible to roll out at locations of your interest according to your specific needs

