

Data Acquisition and Analysis in the Application Platform for Intelligent Mobility (AIM)

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Wissen für Morgen



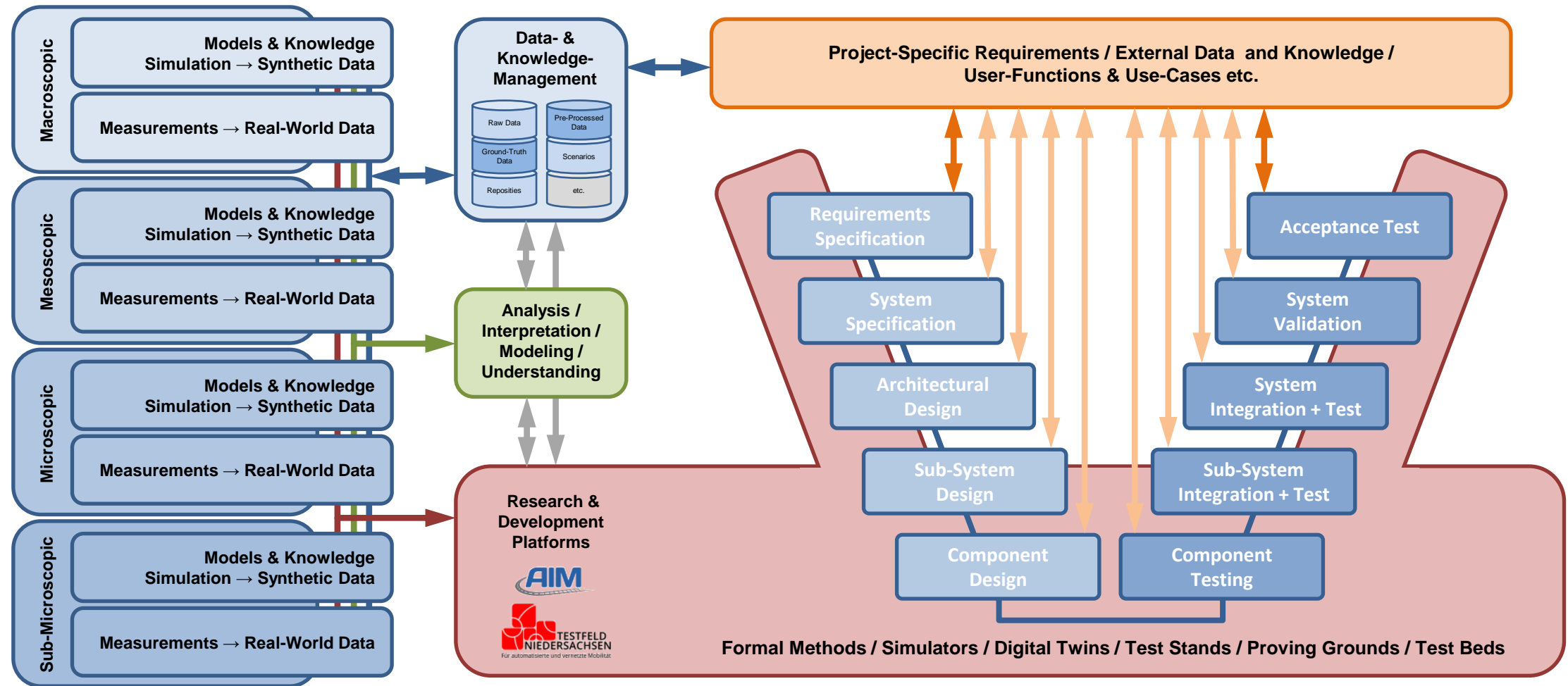
Institute of Transportation Systems – Research Infrastructure

- Laboratories and Large-Scale Research Facilities
 - **Application Platform for Intelligent Mobility (AIM)**
 - **Test Bed Lower Saxony** – planned to be in full operation in 2019
 - LSA-Laboratory
 - DeCodeLab
 - IdeeLab
 - ...
 - ICT-Infrastructure
 - Databases & Application Server



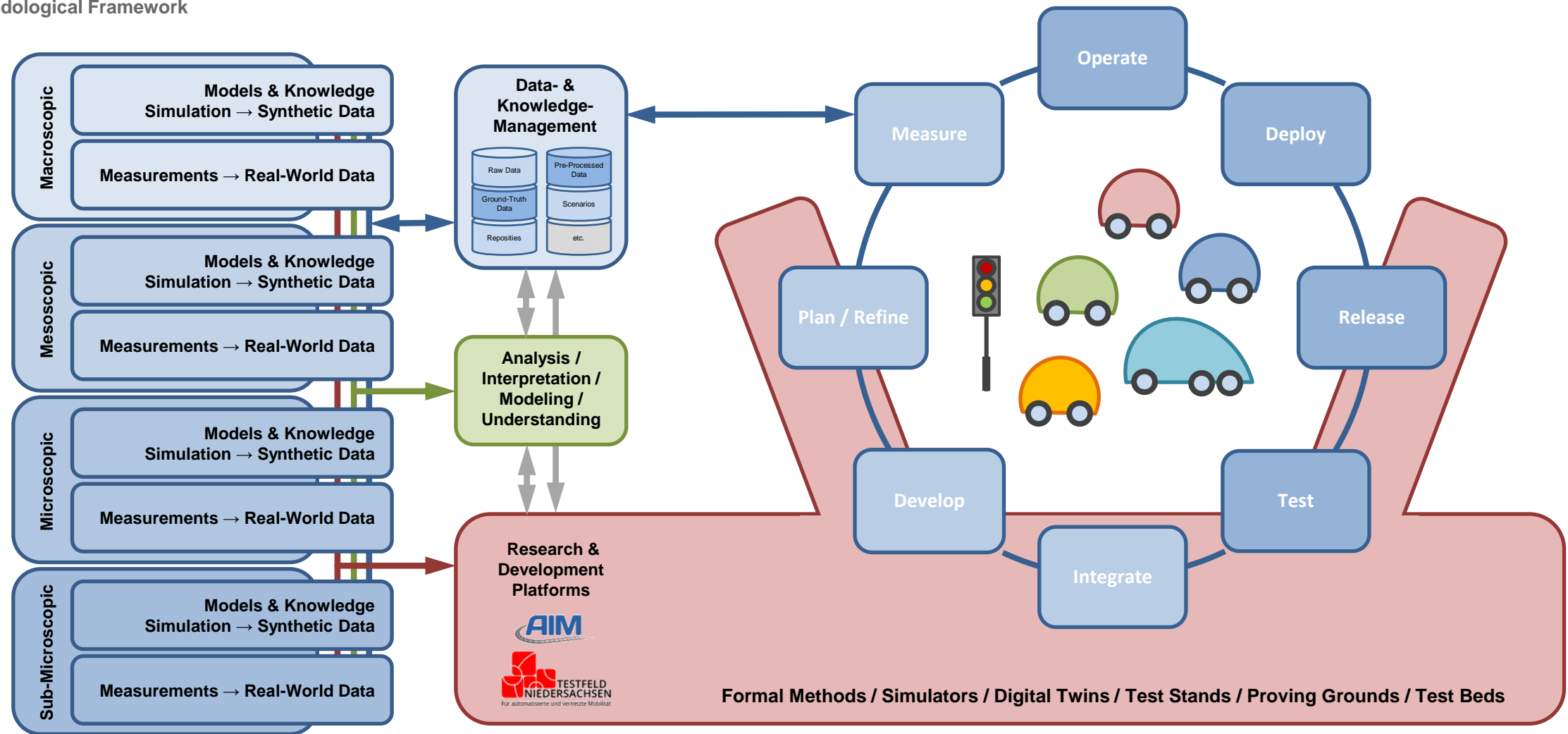
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Methodological Framework



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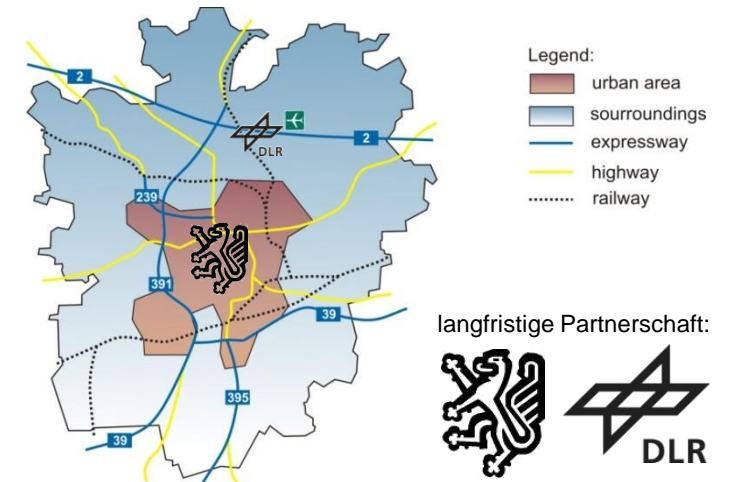
Methodological Framework



Application-Platform Intelligent Mobility (AIM) ^(1/13)

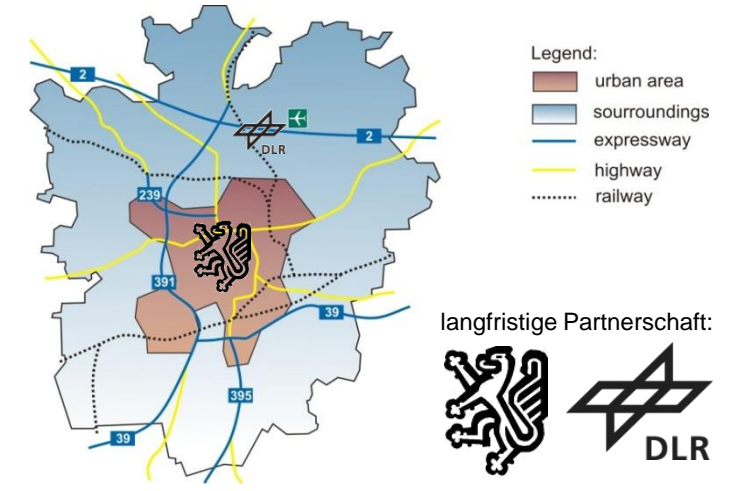
Large-scale research infrastructure in the area of Brunswick (Germany): An entire city serves as a platform for application-oriented research and development-activities in the field of intelligent mobility

- AIM consists of
 - databases, models, simulation toolboxes and simulators
 - dedicated test tracks
 - real urban areas within the city of Brunswick
 - selected surrounding areas around the city of Brunswick
- Besides observation it is possible to influence selected large-scale aspects (e.g. traffic flows) and microscopic aspects of traffic/mobility (e.g. via traffic lights and assistance and automation systems).
- The different building blocks of AIM are represented by a set services / service-clusters.



Application-Platform Intelligent Mobility (AIM) (2/13)

Services / Service-clusters provided by AIM



langfristige Partnerschaft:

Niedersächsisches Ministerium für Wirtschaft, Arbeit und Verkehr
 Niedersächsisches Ministerium für Wissenschaft und Kultur

– Overview

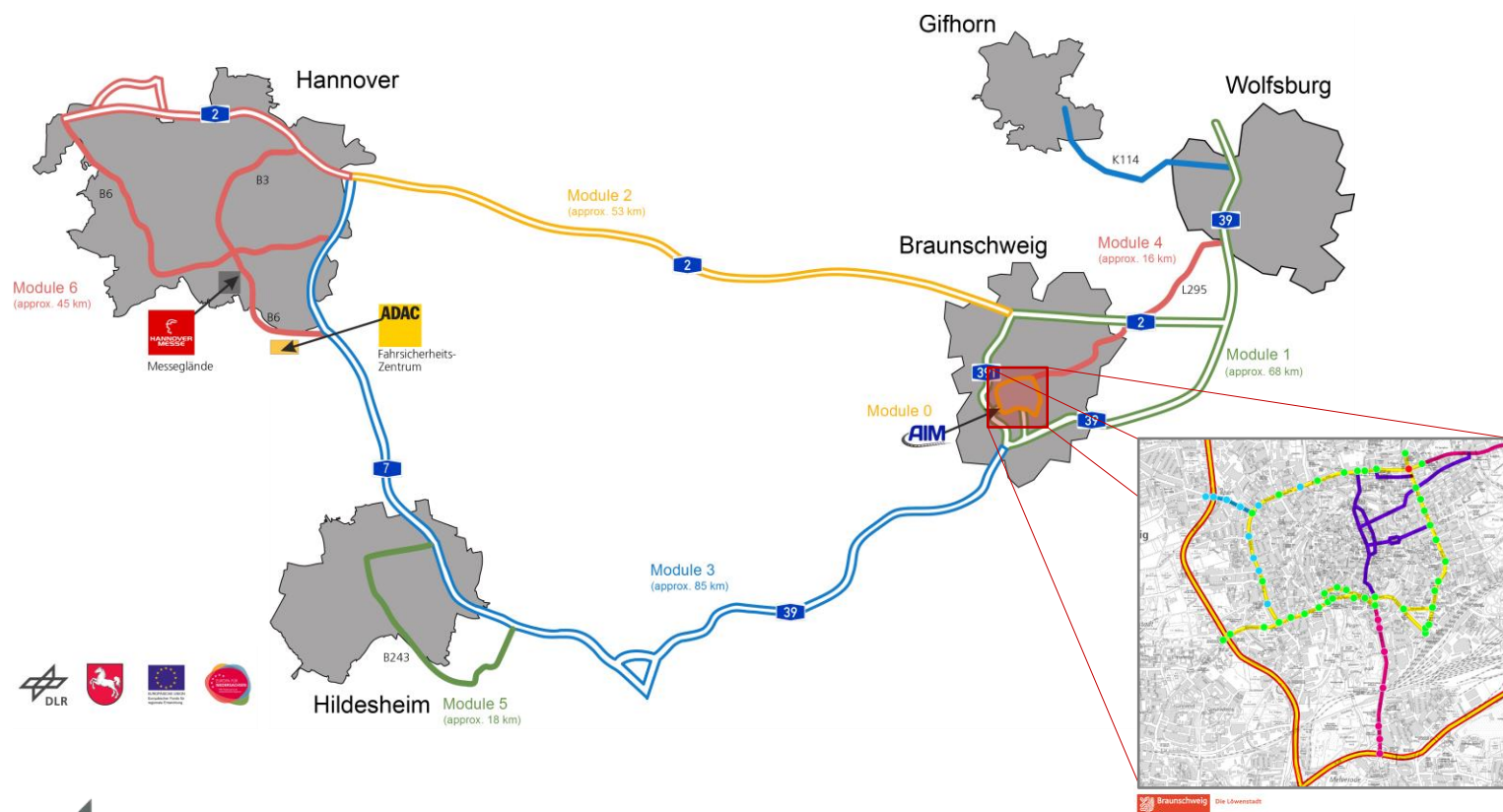
- Reference track
- Databases / Maps / Models
- Simulation / Simulators
- Traffic flow data in the BS region
- Modular Mock
- Modular and S
- Test tracks
- Reference
- Infrastructure / Proving Grounds / Living Labs – for Development and Test
- High-precision positioning in the BS urban area
- Virtual traffic management centre
- Vehicles
- Traffic management / test
- Data-Platforms / Backend-Systems for Data and Services
- Mobility portal



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Test Bed Lower Saxony ^(1/3)

Approximately 280 km of different types of roads will extend AIM – with a focus on highways. Technical components of the Test Bed Lower Saxony are based on established AIM-Components. The integrated use of AIM and Test Bed Lower Saxony will be possible.



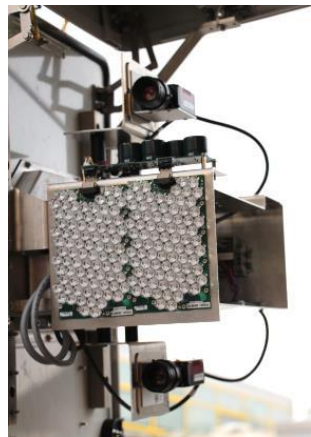
- **Camera-based Detection** – anonymized detection of traffic objects and their trajectories → ground truth
- **Communication** – Car2X via WiFi 802.11p and Mobile
- **Maps** – highly accurate and up to date maps for vehicles and various simulation-purposes
- **Scenarios and Models** – parametrizations and (sub-) models for the construction of (ecologically) valid simulations
- **Interfaces to Traffic Infrastructure and traffic-related Databases** – e.g. connection to the traffic management
- **Backend-System** – data management and delivery of online services
- **Cadastre** – in particular, documentation of the test field status / quality

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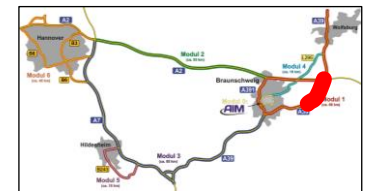
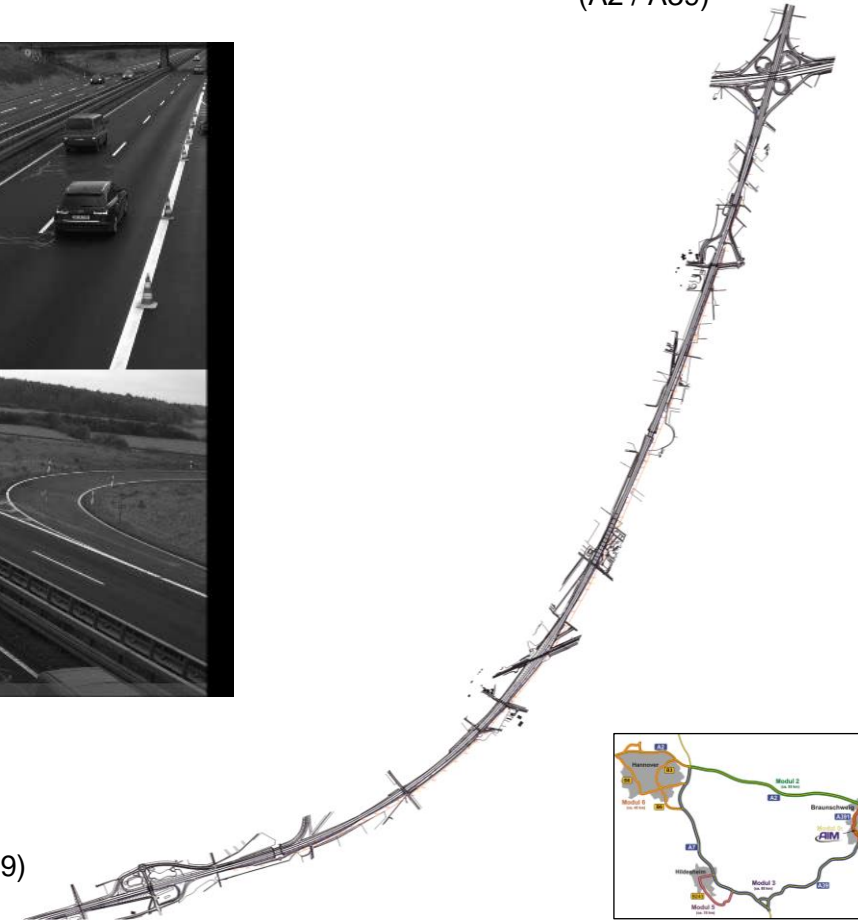
Test Bed Lower Saxony ^(2/3)

Camera-based Detection of Traffic

Kreuz Wolfsburg/Königsutter
(A2 / A39)



Anschlussstelle
Cremlingen (A39)



Applications – Simulation-Based Testing (1a/3)

Proving Grounds & Test Beds

Used Sensors



Mobile Sensor Pole
connected by V2X

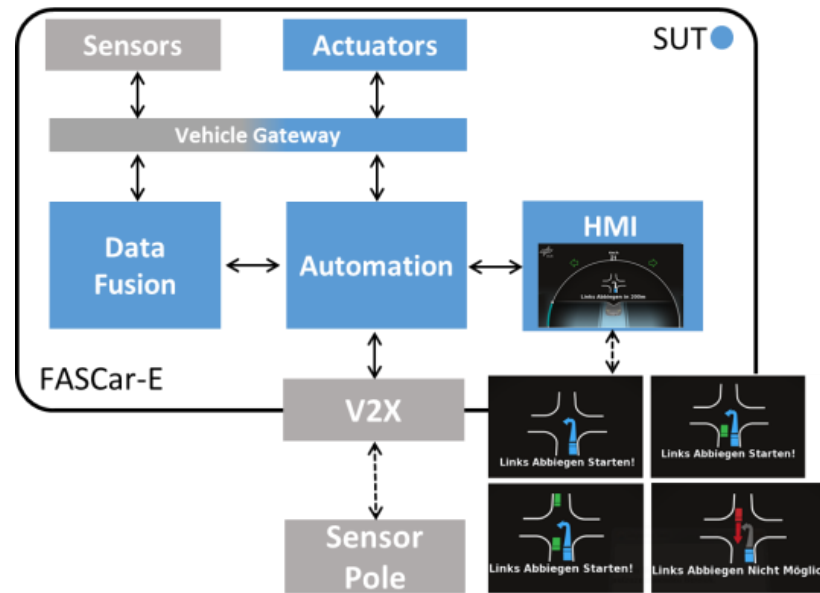
Lidar
IBEO 

V2X
NEC Linkbird 

DGPS 



System Under Test (SUT)



Simulation & Simulators

Required Models

- Vehicle Model
- Lidar Model
- V2X Model
- GPS Model
- Sensor Pole Model
- Steering Force Injection Model
- 3D Environment Model



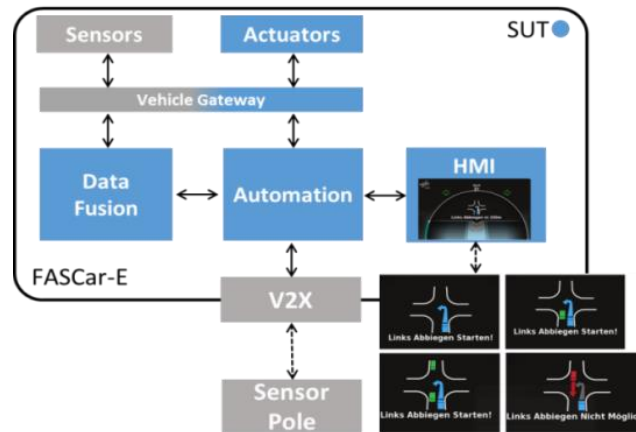
Applications – Simulation-Based Testing (1b/3)



Proving Ground



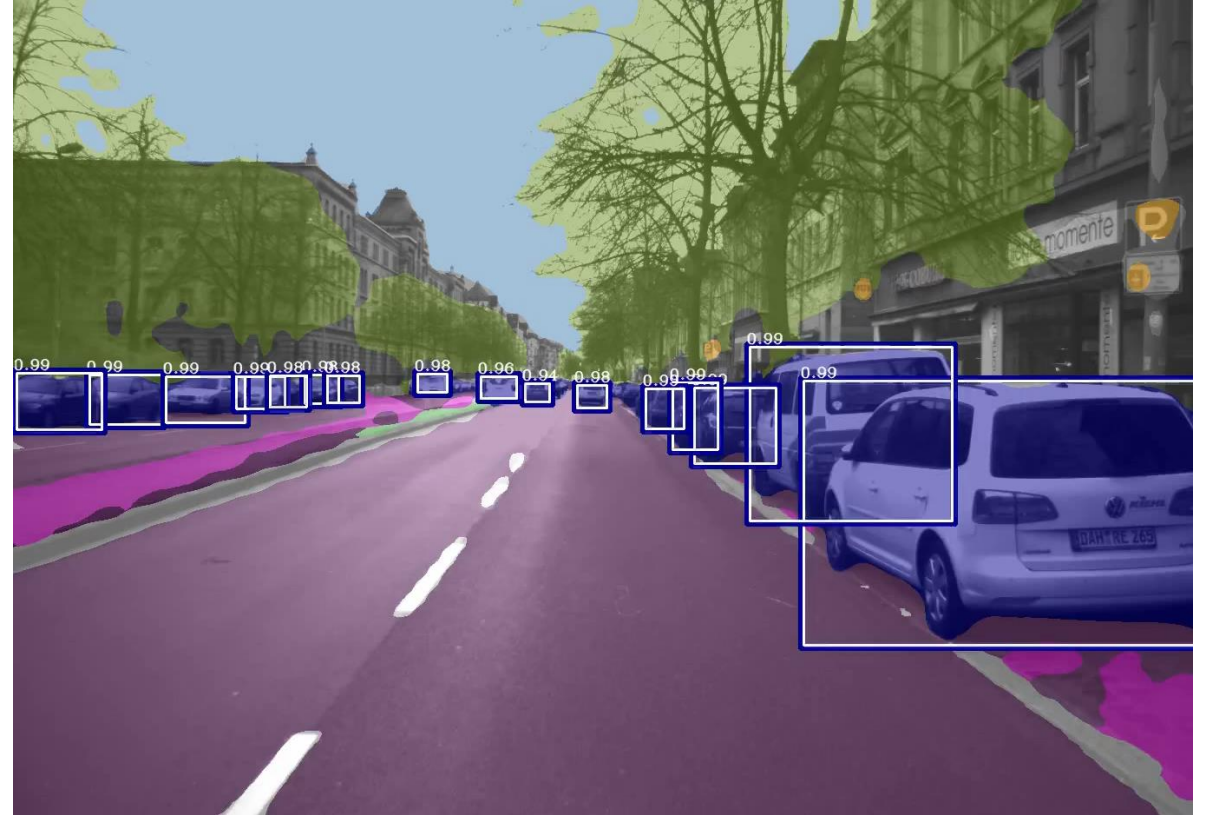
System Under Test (SUT)



Simulation



Applications – Camera-Based Sensor Systems ^(2/3)



Applications – AR-based Test-Environments (3a/3)



Thank You for Your Attention...

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