Basics for Testing – Stand 14

INTERDISCIPLINARY TEST INFRASTRUCTURES / MAPS

PEGASUS

Real-world and generated highly precise maps for the test case. How to get the roads from reality and the test scenarios into the simulation?

Road Generation:

To represent all different kinds of motorways an automated and parametrized generation is used.

It is based on the standard cross-sections of German motorways, which can be adapted in their course and infrastructure.

Result: Generation of all types of motorways, which are necessary for test coverage. In simulation.

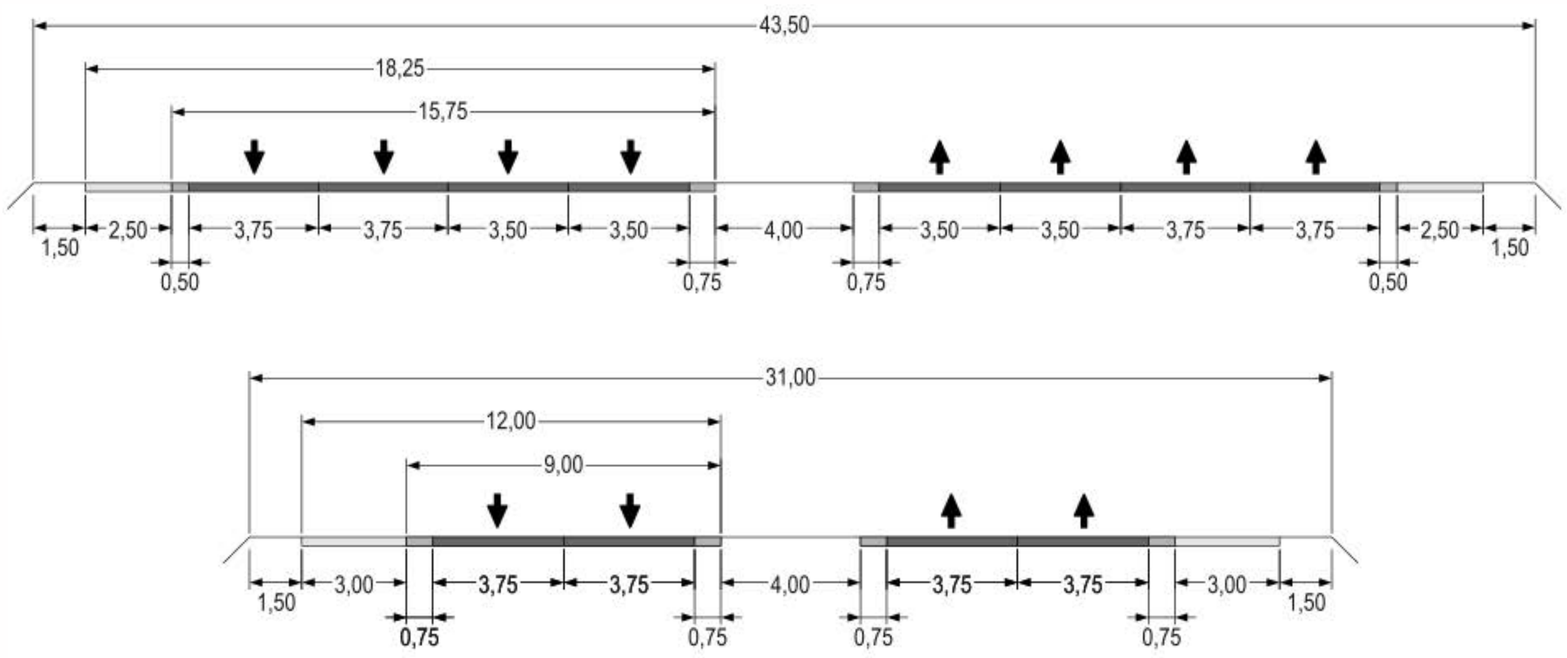

Figure 1: Parametrized road generation based on standard motorway cross-sections.

Road Mapping:

Highly precise mobile mapping of a large scale motorway section to provide real-world data. Coverage of a comprehensive object catalogue analog to the road generation.

Result: Extensive and high-precision dataset about motorways for simulation and field trials.

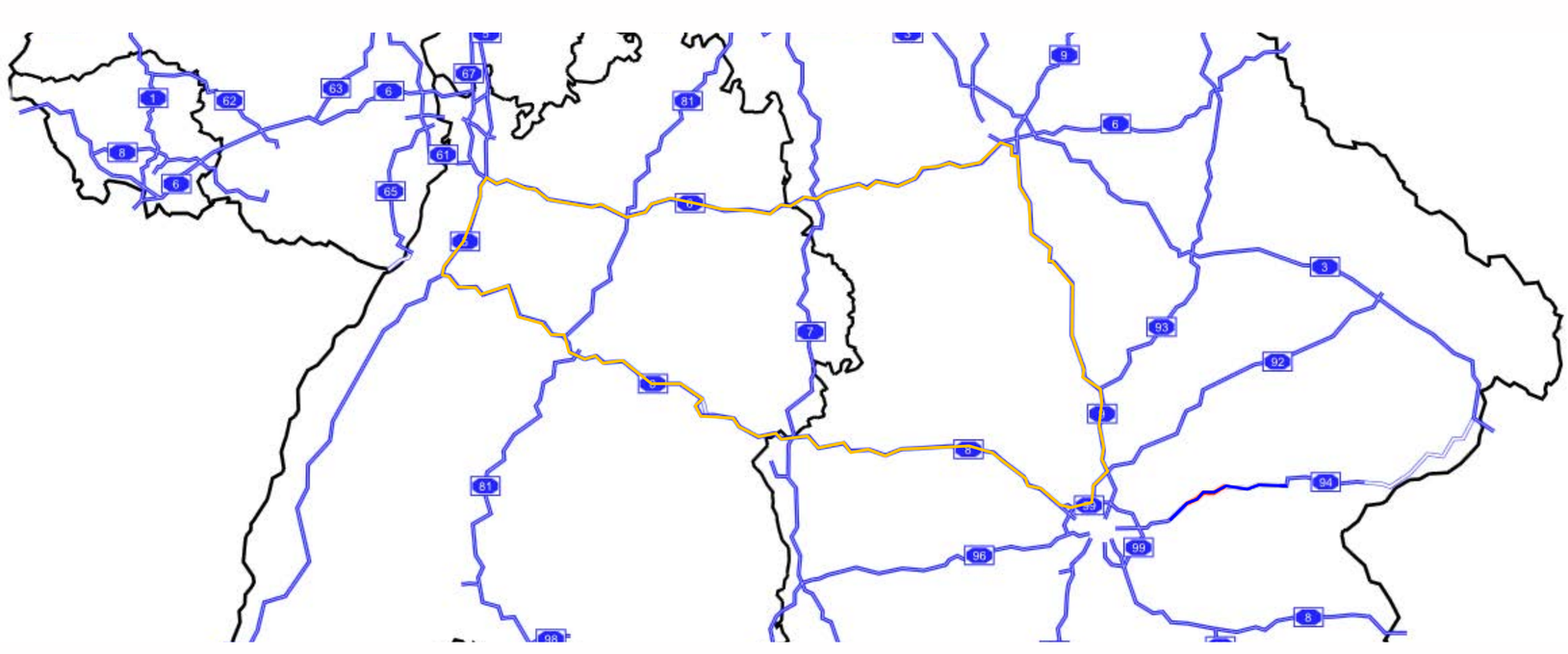

Figure 2: For PEGASUS project mapped motorways.

Geodata Server:

Server based deployment of mapped and generated roads in OpenDRIVE format.

Area, route or specific feature based selection of road data is planed.

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www.pegasusprojekt.de

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ROAD GENERATION

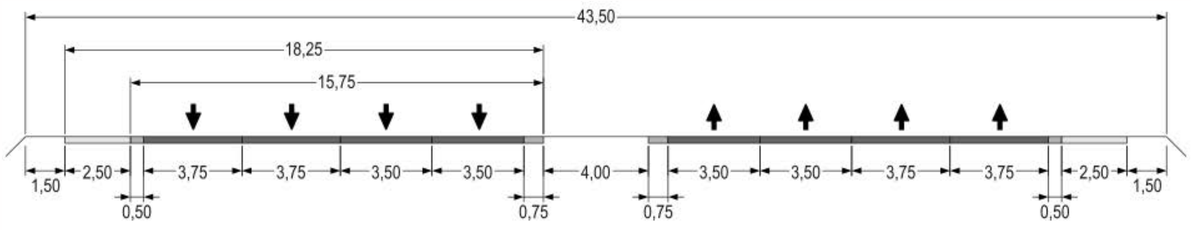
PEGASUS

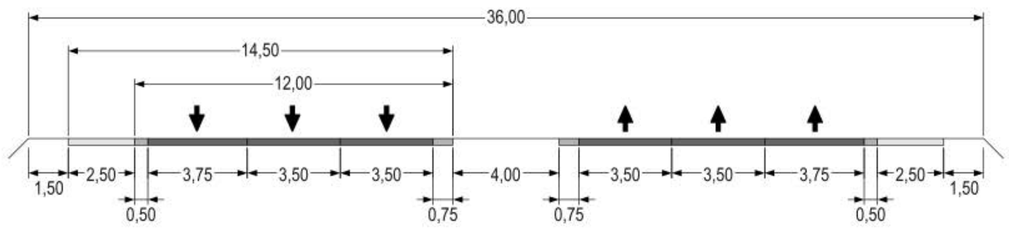
Parameter-based road generation to provide all reasonable types of motorways

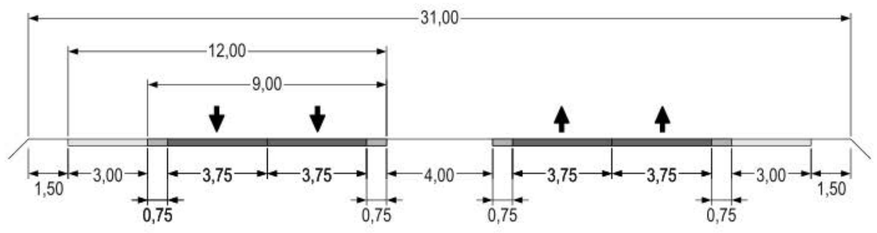
Using a simplified XML-based road description to define road sections and its road infrastructure. A toolchain transforms this descriptions into specific OpenDRIVE road networks.

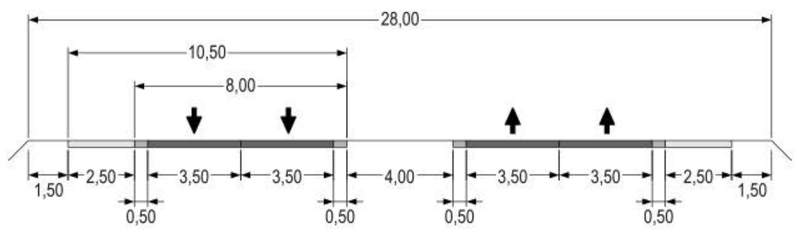
Systematic

- Automated and macro-based generation of motorway sections of a defined cross-section
- Refined with additional specification of:
  - Elevation (hills and valleys)
  - Course (curves)
  - Lateral profile
  - Road lanes and their markings
- Supplemented with road signs, infrastructure (noise barriers, guard rails, etc.) and vegetation
- Motorway section deployed in OpenDRIVE format







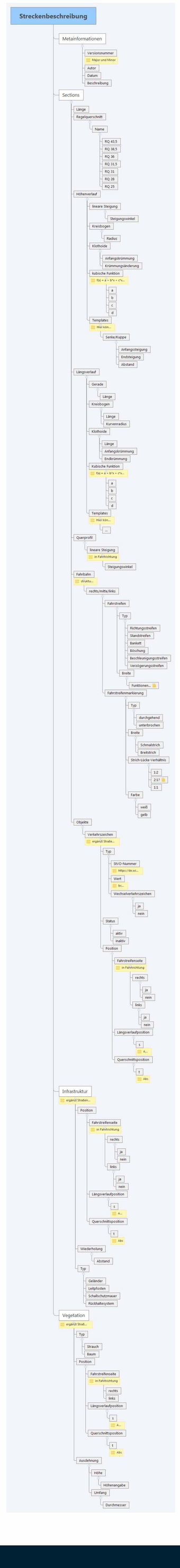


Integration

Transformation is implemented as batch process an can be implemented as fully automated server-based service.

Further Development

It is planed to enhance the generation for transition of cross-sections, motorway entries and exits etc.



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ROAD MAPPING

Mapping of different types of motorways as real-world geodata basis for validation of the simulation using generated roads

Road Mapping

Mobile multi-sensor mapping to collect course of the road, constructional characteristics as well as road infrastructure.

Representation of a large-scale test area including different types of motorways. Usage in simulation and field trials.

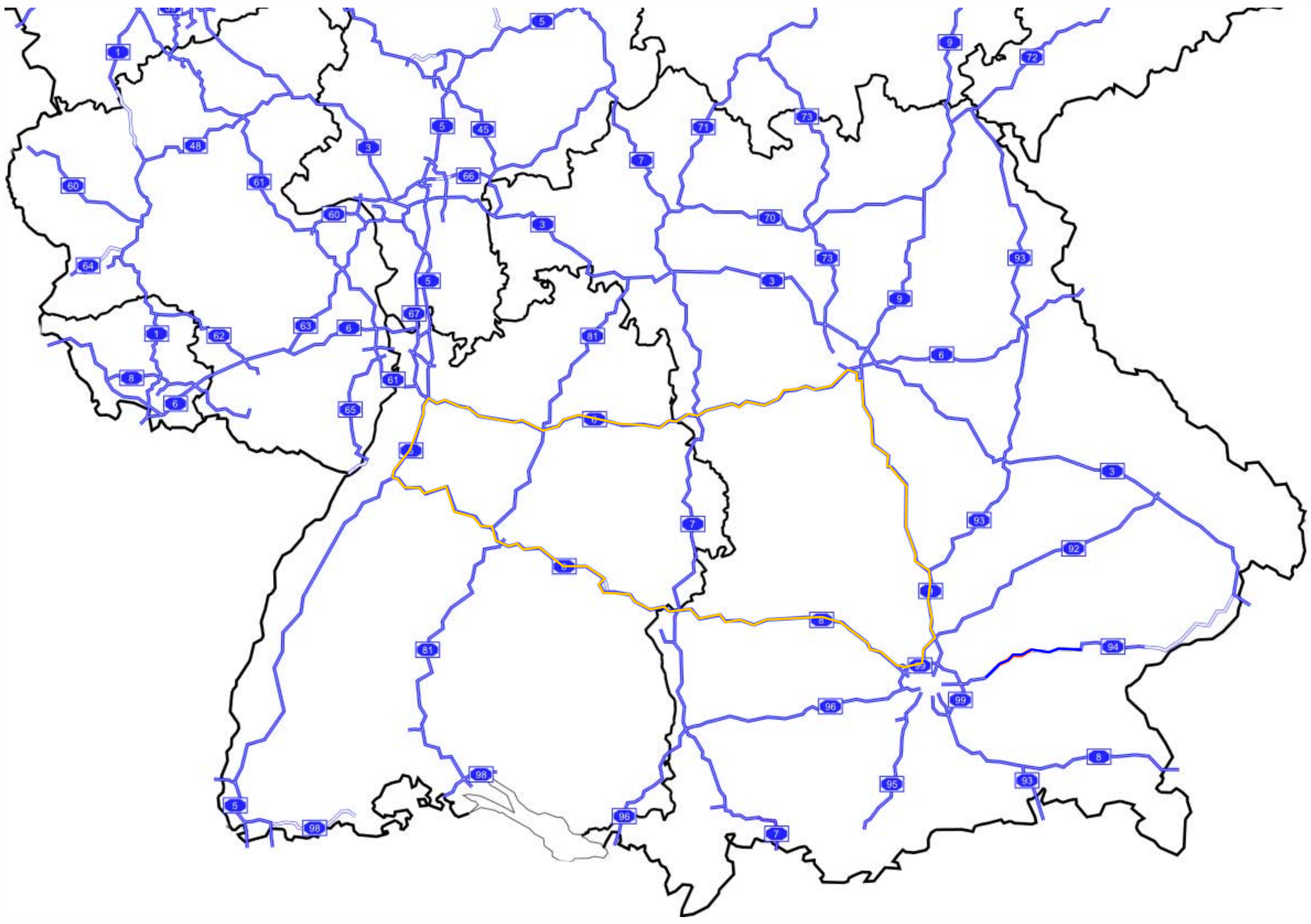

Figure 1: For PEGASUS project mapped motorways with motorways 6, 9 („Digitales Testfeld Autobahn auf der Bundesautobahn A9 “), 8 and 5 (clock-wise). Total length about 700 km per direction of travel.

Data Processing

- Ground control point-based processing of trajectories to achieve a high accuracy
- Homogenization of all mapping runs

- Assessing of the processed raw data regarding road lanes and objects (based on a comprehensive object catalogue)
- Transformation and Deployment of the data in OpenDRIVE format

Figure 2: Example of a motorway interchange after mapping and processing in OpenDRIVE format.

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