



# Data capture and maintenance

## Introduction

The key output of the EuroRoadS project is the specification framework which enables the provision and exchange of harmonised, interoperable and quality assured road data. It provides a vital link between potential (public sector) data suppliers and (private sector) data users.

The EuroRoadS specification framework is defining the interface between data supplier and data user. Yet, the usability of the framework – in particular those parts dealing with data quality – can only be fully evaluated if the entire information chain from data supply to end use is well understood. For this reason, data capture and maintenance activities are implemented and analysed for the test site Bavaria, thereby allowing to analyse the complete information chain from data capture to the final end-use service.



The EuroRoadS data chain

This leaflet is one out of five leaflets providing details on the different EuroRoadS demonstration components. The other leaflets on demonstration are 'demonstration overview', 'metadata server', 'data processing' and 'client application SpeedAdvice'.

## Objectives

The Bavarian test site has different objectives

- To test and evaluate different data capturing methods and techniques with regards to resources needed and quality;
- To establish workflows for data maintenance by the administration in charge of speed limit orders;
- To provide data of high detail and quality to the EuroRoadS demonstrator;

The test site is based on the Bavarian INTREST System (Intermodal referencing system for traffic related data), which offers a central server and database for decentralised geo-referencing and data maintenance. This system is extended to speed limits according to the EuroRoadS requirements.

## Description of the test site

As the Bavarian test site for EuroRoadS demonstration the District and the "district-free" City of Ansbach with an overall road network of 4000 km has been chosen. The responsibility for traffic ruling in general depends on the road class and the location of the road.



Testsite of city and district of Ansbach, Germany.

The centralised highway agencies (two in Bavaria) order traffic signs on the federal highways. For ruling on federal roads, state roads and district roads in the district each district authority (71 in Bavaria) is responsible, in the area of "district-free" cities (25 in Bavaria) the municipal authorities can overtake this responsibility. For community roads, the communities themselves have the right for traffic ruling.

## Data sources

The concept for initial data supply is to use existing implicit speed limits (speed limits according to national laws, not sign-posted) first and to update this information by research of explicit sign-posted regulations. For the highways in Bavaria the highways agency has up-to-date speed limit data available. The subordinate road network will be covered by several sources:

- The first source is existing ruling papers and paper forms as output of road maintenance activities, which are stored logically at the authorities that install the signs (road surveillance centres).
- Use of local knowledge i.e. questioning of people involved in the ruling and installing process, like the police or responsible persons in cities, communities and road authorities can be useful as well especially for the lower level road network.

Local knowledge (L)	STROADS (S)	Road surveillance data (A)	GPS field inquiry (G)
<ul style="list-style-type: none"> <li>• community roads</li> <li>• analogue information</li> <li>• based on analogue maps</li> <li>• 25 communities</li> <li>• questioning of experts (municipal road surveillance)</li> <li>• maps, tables, text</li> <li>• point information</li> </ul>	<ul style="list-style-type: none"> <li>• federal and state roads</li> <li>• digital information</li> <li>• based on coordinates and mileage</li> <li>• one-directional</li> <li>• manual sifting of pictures</li> <li>• extraction of pictures from the database, entering of information into Excel</li> <li>• Point, linear and picture information</li> </ul>	<ul style="list-style-type: none"> <li>• federal, state and district roads</li> <li>• analogue information</li> <li>• based on mileage</li> <li>• bi-directional</li> <li>• hand written information transferred into Excel sheets and analysed</li> <li>• tables, text</li> <li>• point and linear information</li> </ul>	<ul style="list-style-type: none"> <li>• highways, federal, state, district and community roads</li> <li>• digital information</li> <li>• based on coordinates</li> <li>• bi-directional</li> <li>• manual sifting of pictures</li> <li>• acquisition while driving</li> <li>• automatically generated tables, manual entering into the database</li> <li>• point and pict. info.</li> </ul>

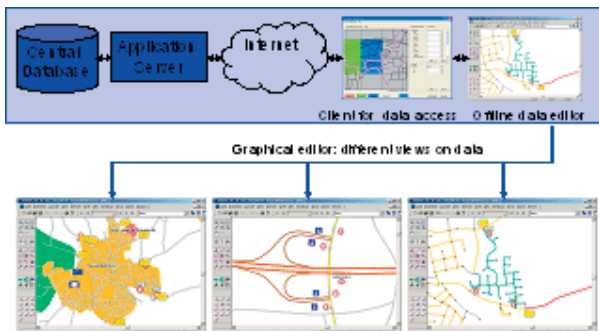
- The STRADIVARI picture database contains pictures of all highways, federal roads and state roads on every 20 meters and can thus be also used to detect speed limits.
- Finally, GPS based field enquiry will fill the gaps left from the other sources.

Using this approach full coverage in the test site can be achieved with comparably low effort. The most important point is to involve all the partners in the test site and to motivate them to assist the data acquisition.

To keep the speed limit data up-to-date, new traffic rulings have to be entered to the database after the initial supply. To enable them to enter the data within their normal workflow and keep extra efforts as low as possible, the editor for the data base should ideally be linked to a form software, that they use anyway for filing their traffic ruling forms. Beyond enabling them to deliver data, the additional map information is also very helpful for their everyday work.

### Technical infrastructure

The Bavarian INTREST System provides a harmonised geo-referencing basis for transport related data on a commercial map. It offers a multiuser environment for different decentralised entities to enter and to maintain data in a centralised system. This system environment, in particular the network editing software, has been extended to support speed limit capture and editing for the administration. The editor software allows to perform certain functions (search, documentation of location layout etc.) for the administration process of issuing new speed limit regulation orders.

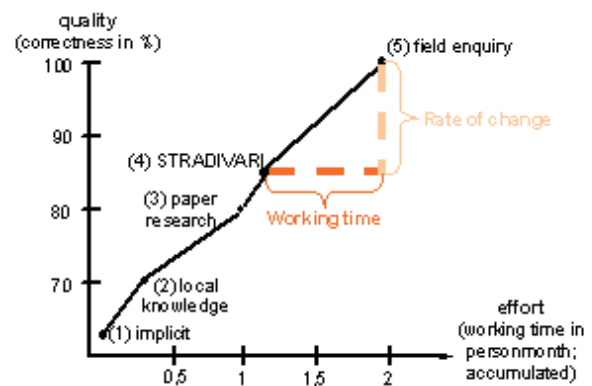


Technical infrastructure

The integration of the geographical editing component into the administration workflow is an important aspect to ensure complete and timely entry of new speed limit information into the system.

### Results

Each data acquisition method is analysed with regard to achievable data quality and necessary effort. For this purpose feasible quality evaluation methods are applied according to the EuroRoadS quality framework. The analysis allows recommendations for the most efficient workflow to reach a required quality level during the capturing phase and suggestions about procedure and frequency for maintenance.



Evaluation of quality improvement and effort per acquisition method

The experience of the data providing process in conjunction with the determined data quality can be used for quality control. Due to data acquisition and maintenance by the responsible authority a higher level of quality and up-to-dateness, in particular, can be realised than by commercial European-wide operating mapmakers. By efficient adaptation of data acquisition and maintenance in the existing workflow of the authorities, the potential to provide quality assured speed limit information can be developed.

### Contact

For further information about Data Capture and Maintenance, please visit EuroRoadS on [www.euroroads.org](http://www.euroroads.org) or contact Work Package leader for WP7 Demonstration: Michael Landwehr, PTV AG  
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