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GNSS DATA ACQUISITION AND PROCESSING-APPLICATION FOR SUSTAINABLE DEVELOPMENT OF THE TRANSPORTATION INFRASTRUCTURE

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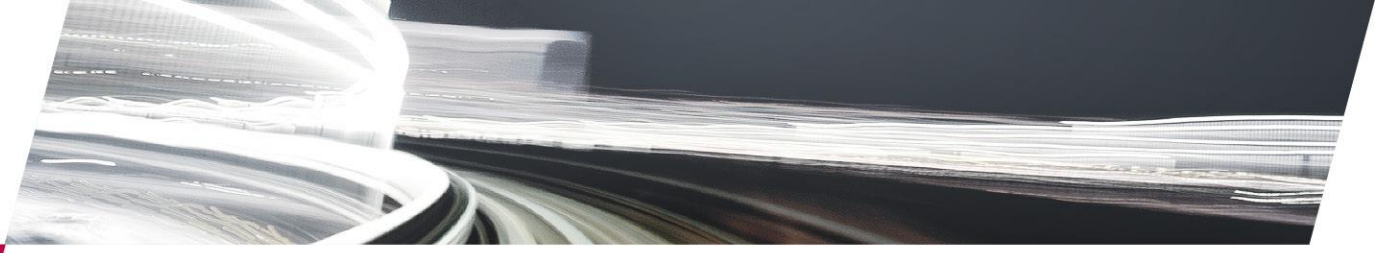
United Nations/Croatia Workshop on the Applications of Global Navigation Satellite Systems
21-25.04.2013

How data becomes solutions



Introduction

- **Mobile Laser Scanning System**
  - Applications
  - **SiRailScan**

    Analysing point clouds, modelling alignment
  - **Atrack-R and Verm.esn**

    Analyze polylines and recover track elements
- **Managing scan data and additional information integrated into SiRail Manager**
  - **SirailView and SirRailLayers**

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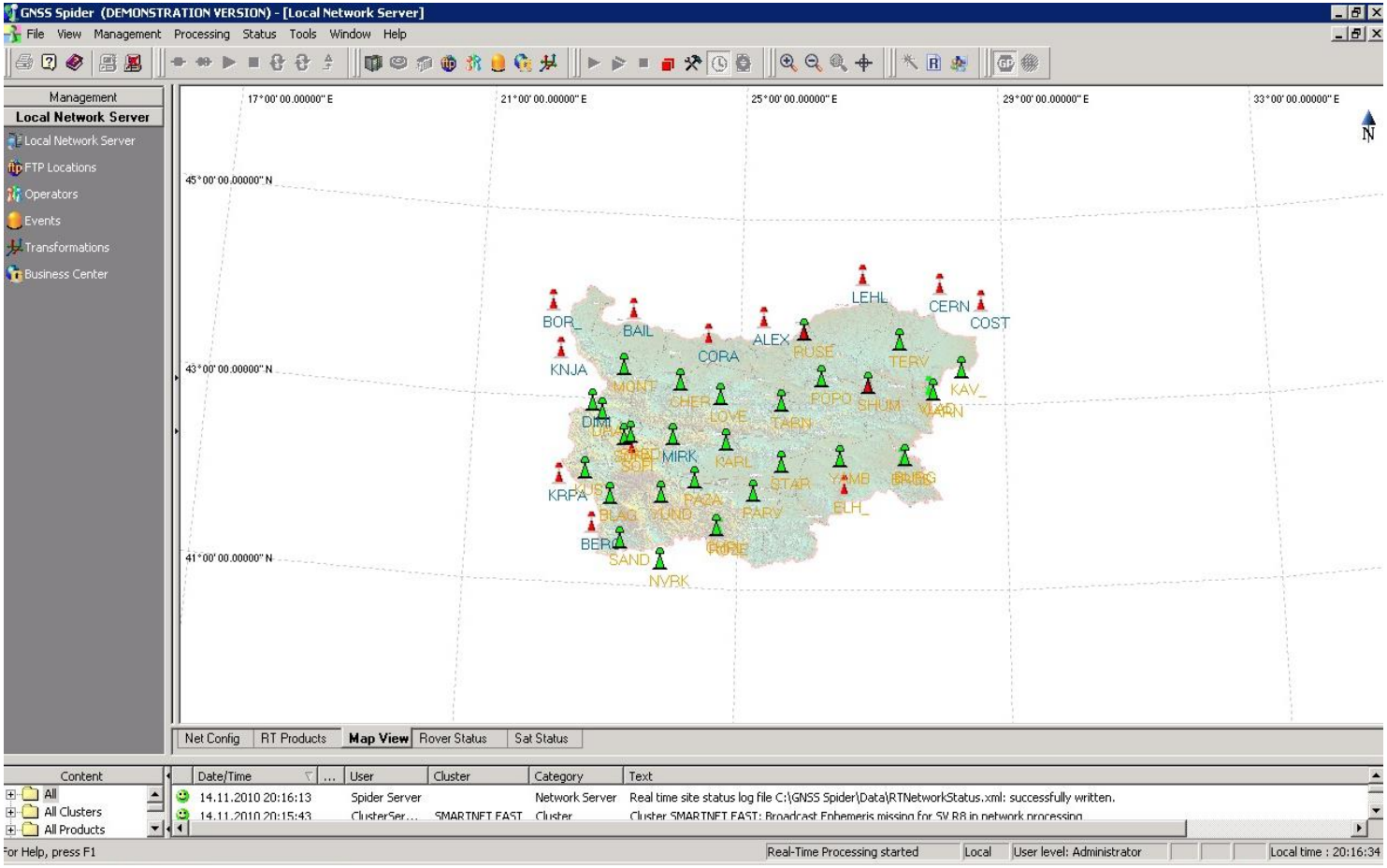
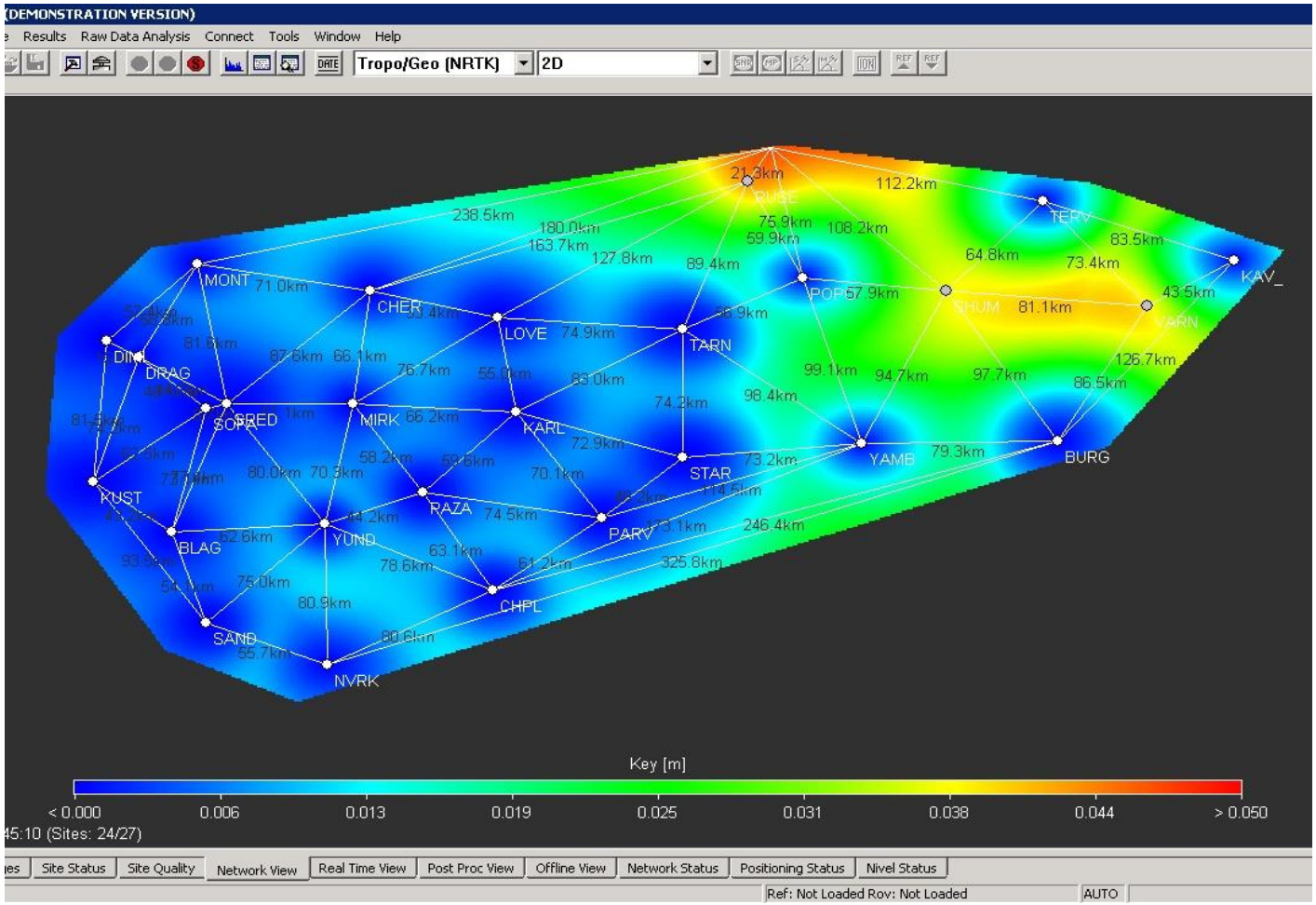
EUPOS ®

Network configuration



Spider Software by Leica

Network accuracy



Spider Software by Leica

MLS technology and its applications for highways monitoring

- Scanning system flexible mounted on various vehicles constructions

Analyzing and processing point clouds with SiRailScan

MLS technology and its applications for railway monitoring and optimization

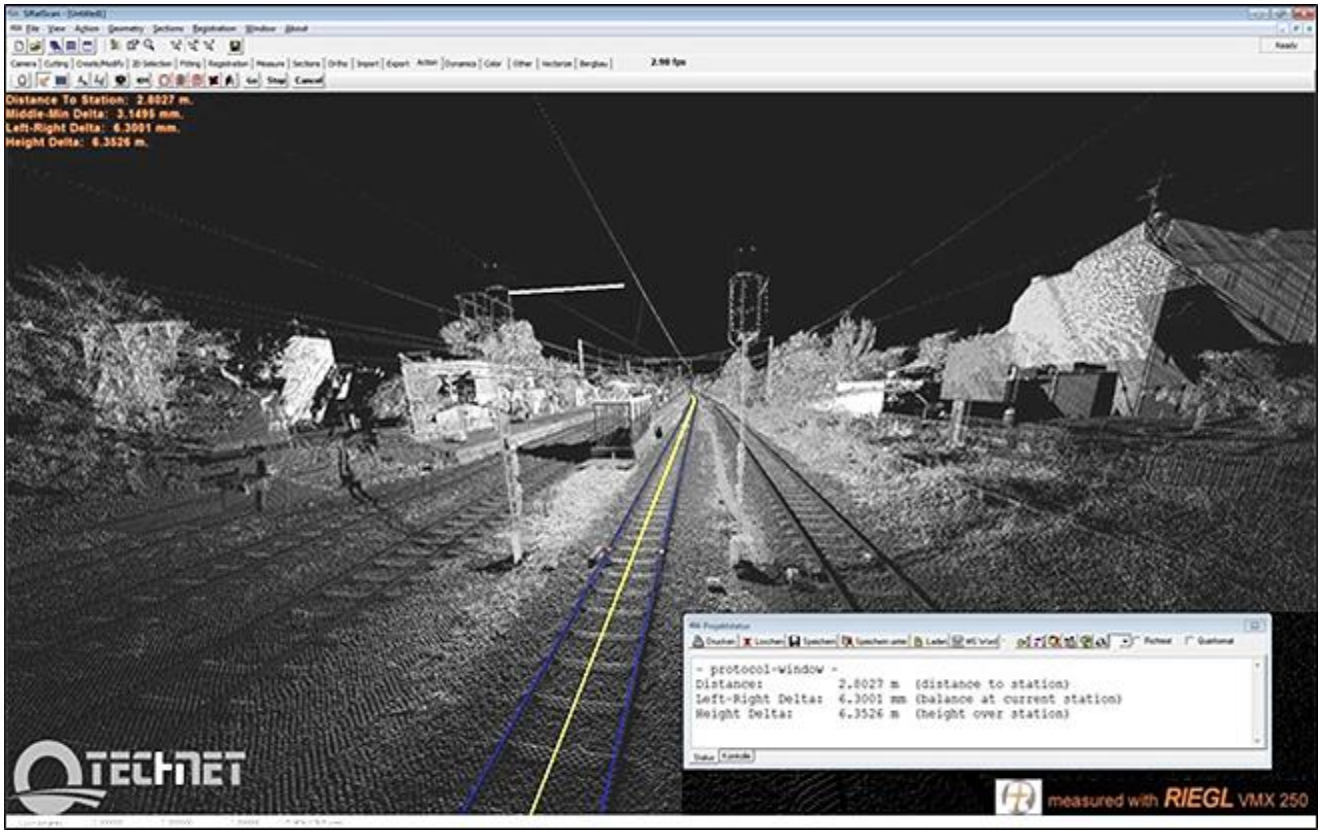
- High-end 3D Railway monitoring GNSS based system

RIEGL VMX-450 Mobile Scanning System
(www.riegl.com)

www.nipistroytek.ru

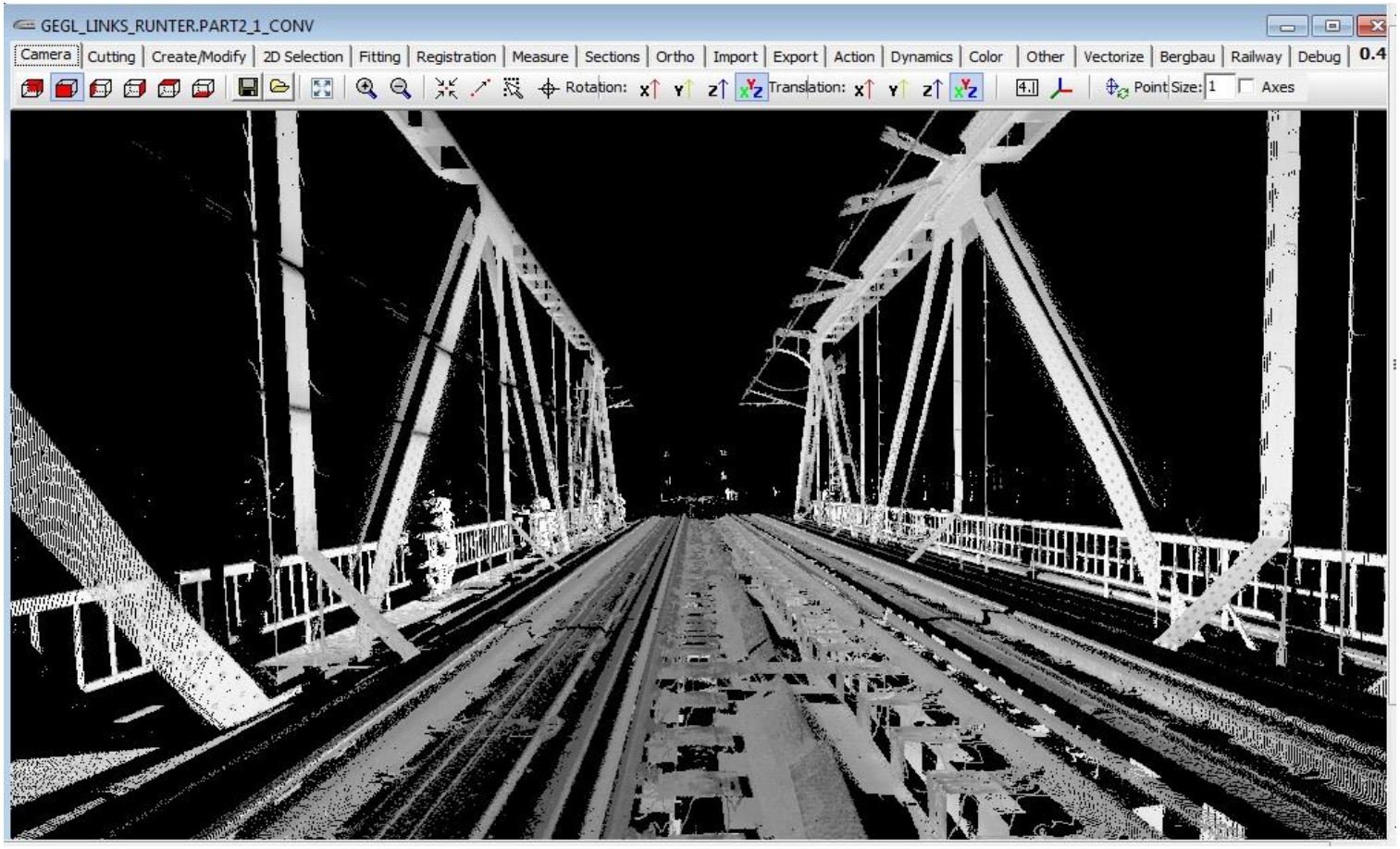
Analyzing and processing point clouds with SiRailScan

- Transition from raw measurement data to 3D point clouds into desired coordinate system especially in chainage based railway reference system
- Detection of rails and infrastructure objects
- Calculation of axis and axis related measurements
- Collision detection with any wagon shape
- Ortho views and sections
- Several import and export interfaces



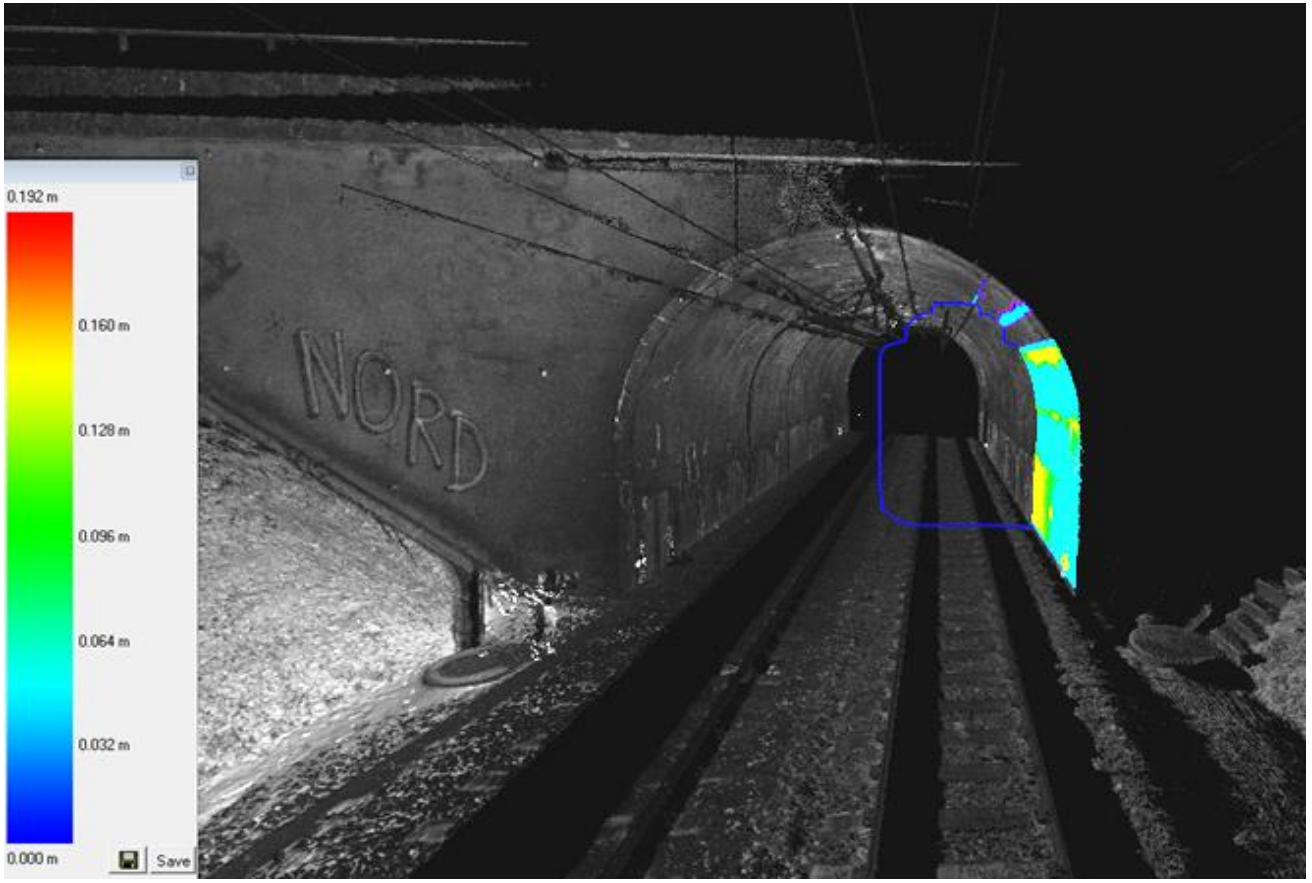
Rails and axis calculation. Perpendicular measurement of distance and height above axis to any point

Analyzing and processing point clouds with SiRailScan for railway bridges monitoring



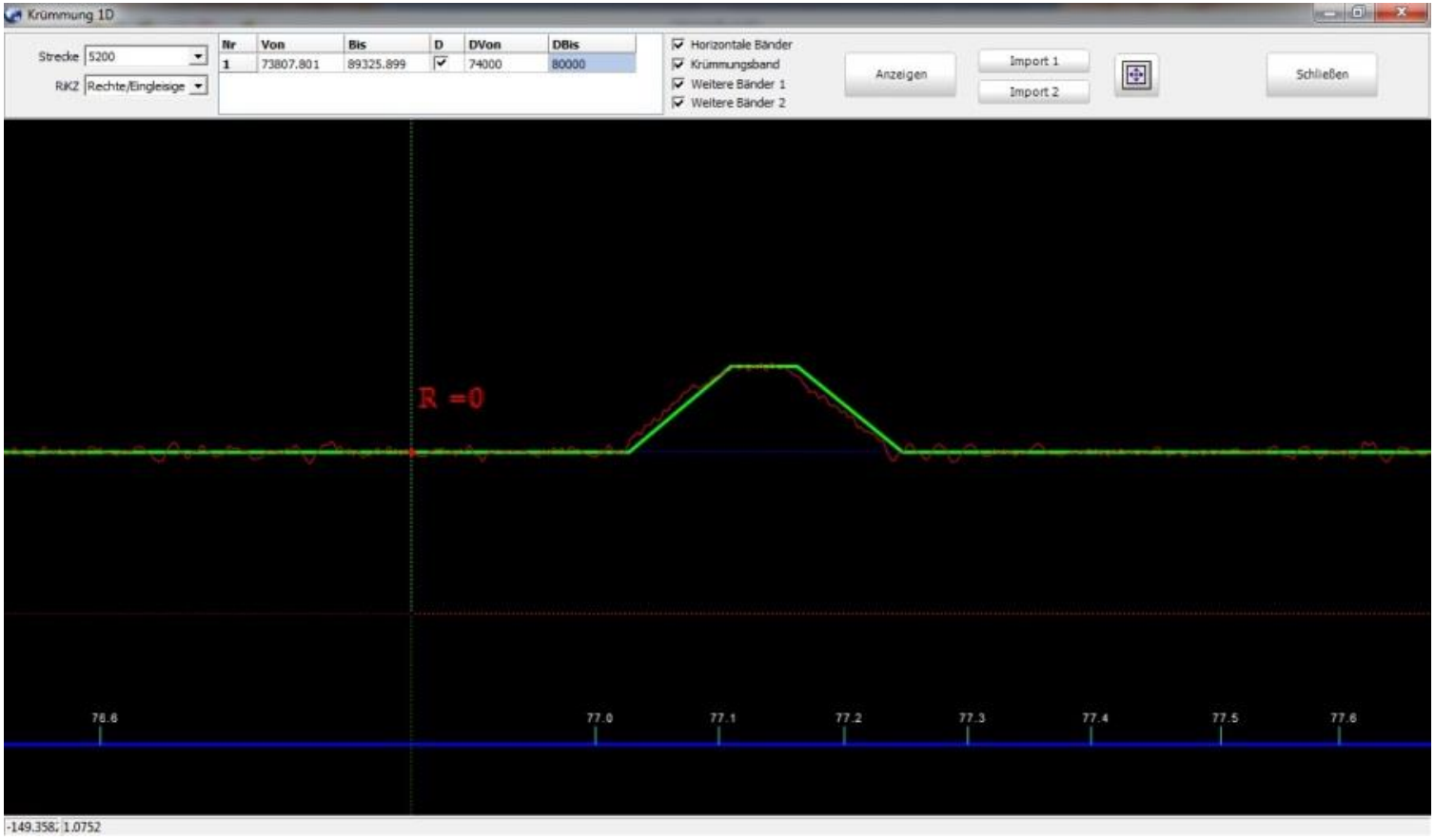
Analyzing and processing point clouds with tunnel specialized application

- Axis based analysis in axis refered point clouds

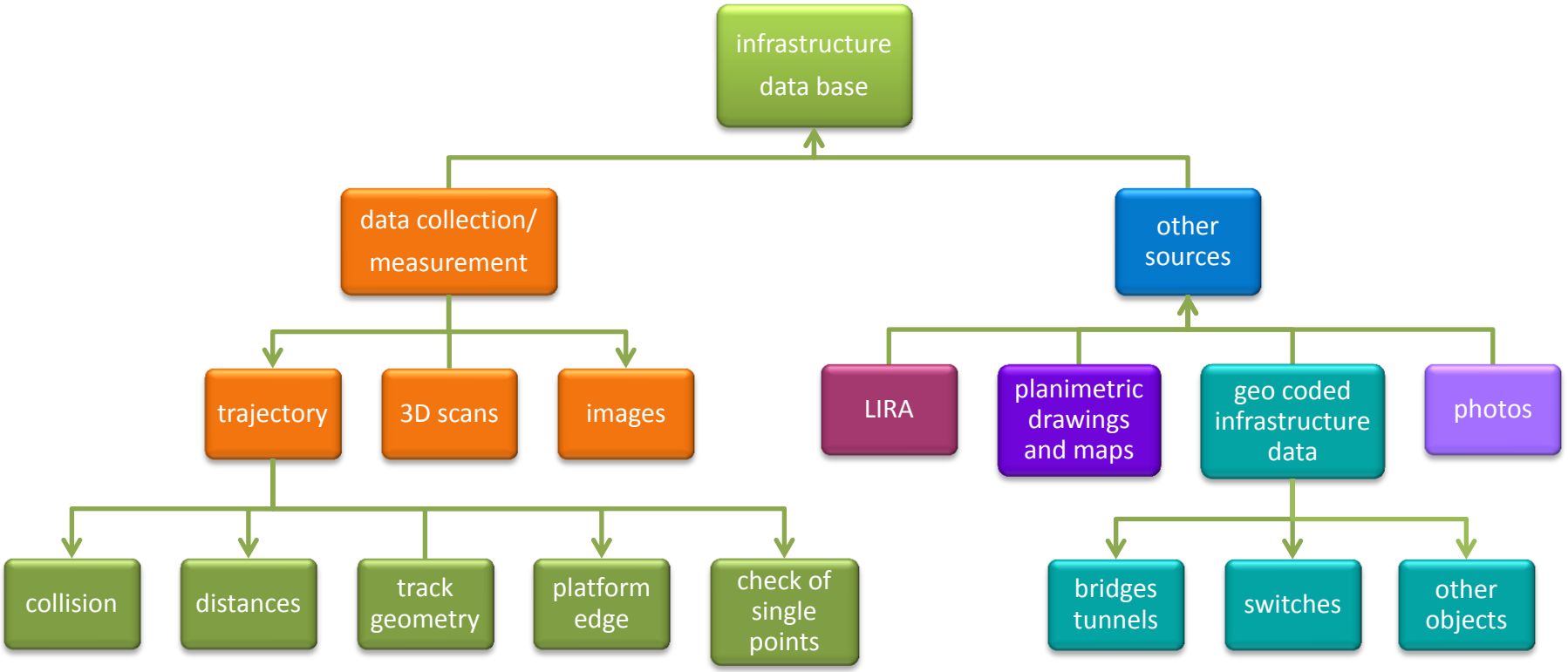


Curvature elements based on the recorded INS data

- Axis based analysis

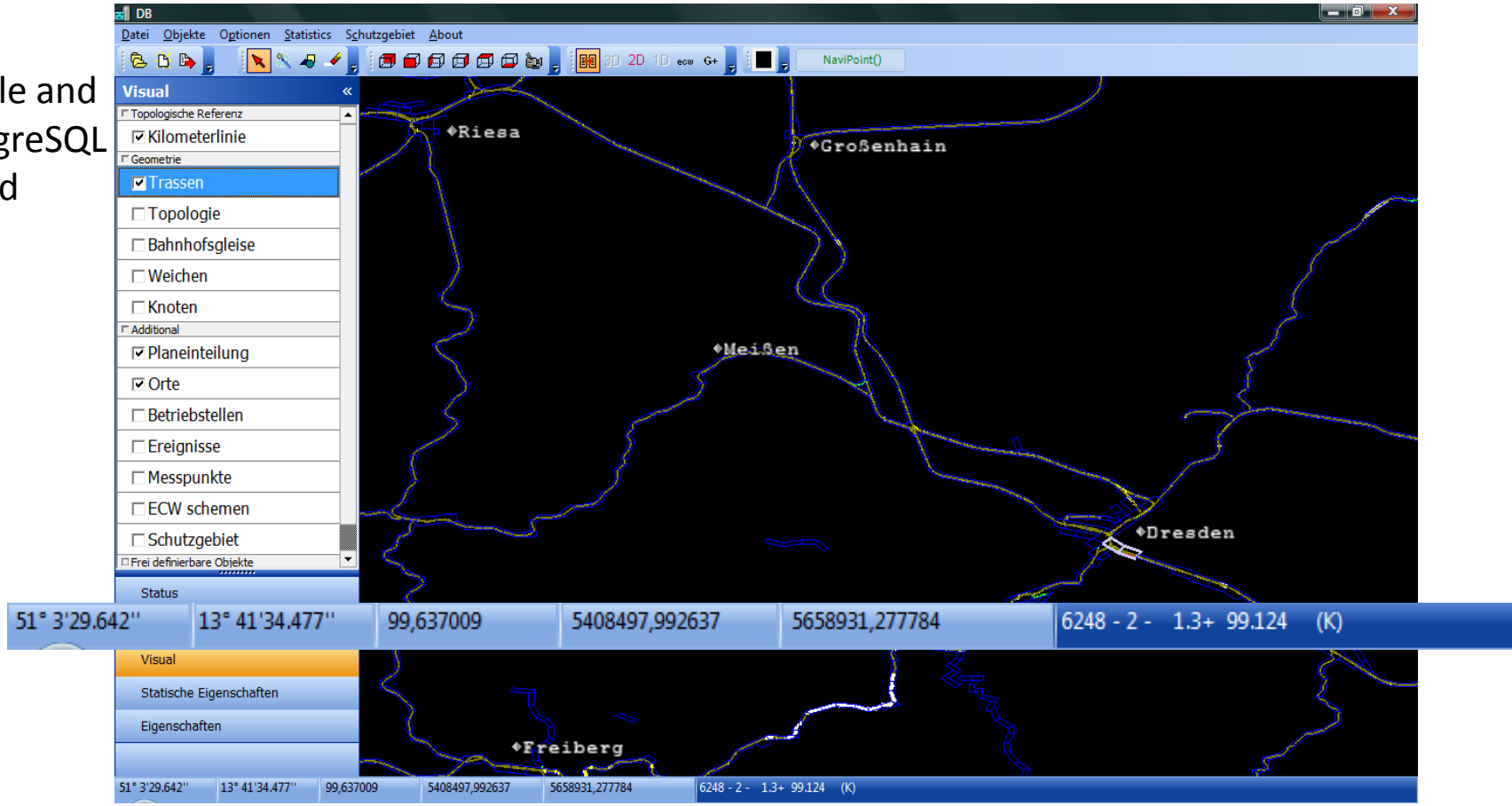


Spatial database. Environmental Resource Information Network



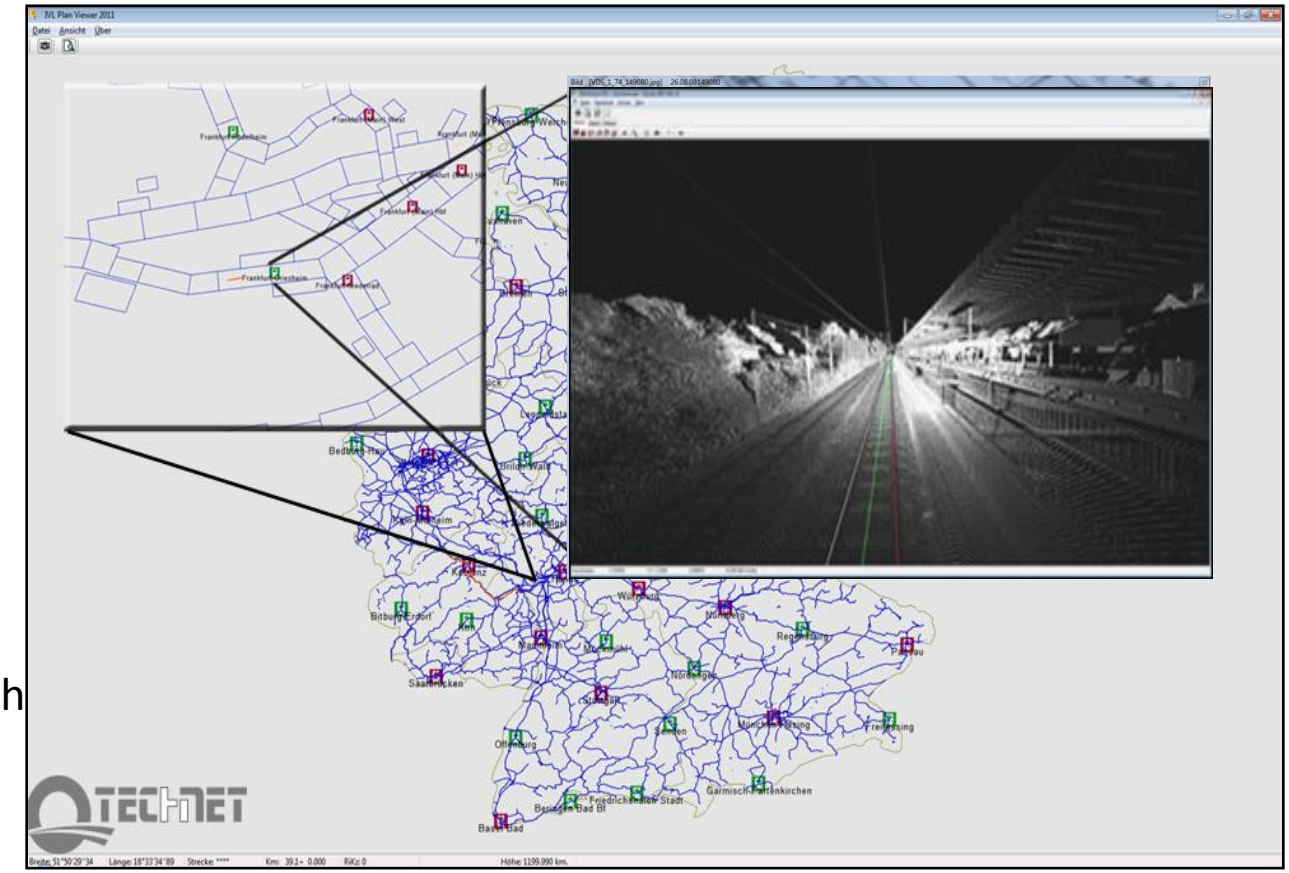
Integrity of the railway navigation database
Ambiguity free system determination

- Oracle and PostgreSQL based



SiRailManager

- Managing of the kinematic point clouds
- Combining the point clouds with web based map services and planimetric drawings
- Client-Server or web based access to all point cloud data (with SiRailViewer)



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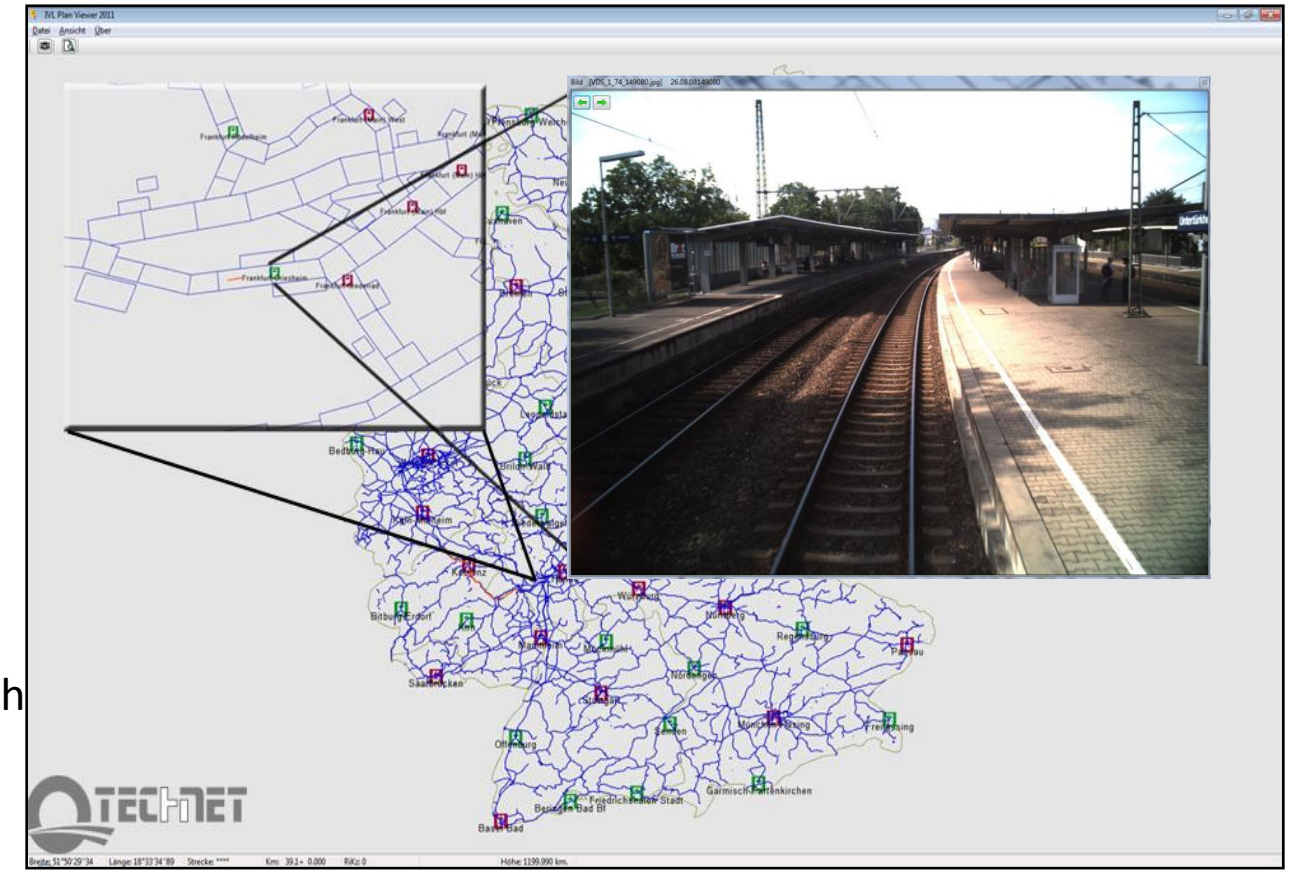

Visualize the timestampt and georeferenced photos from the measurement system

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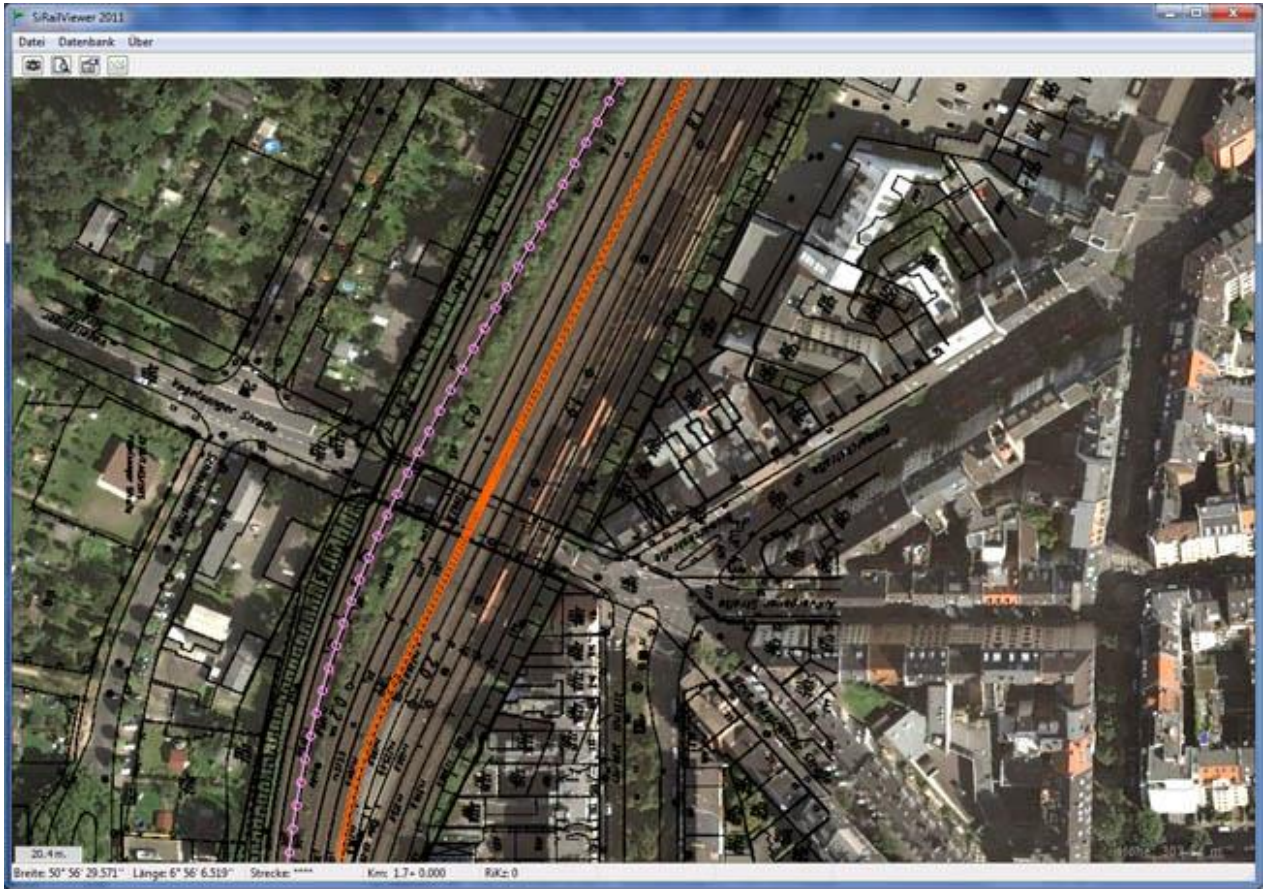
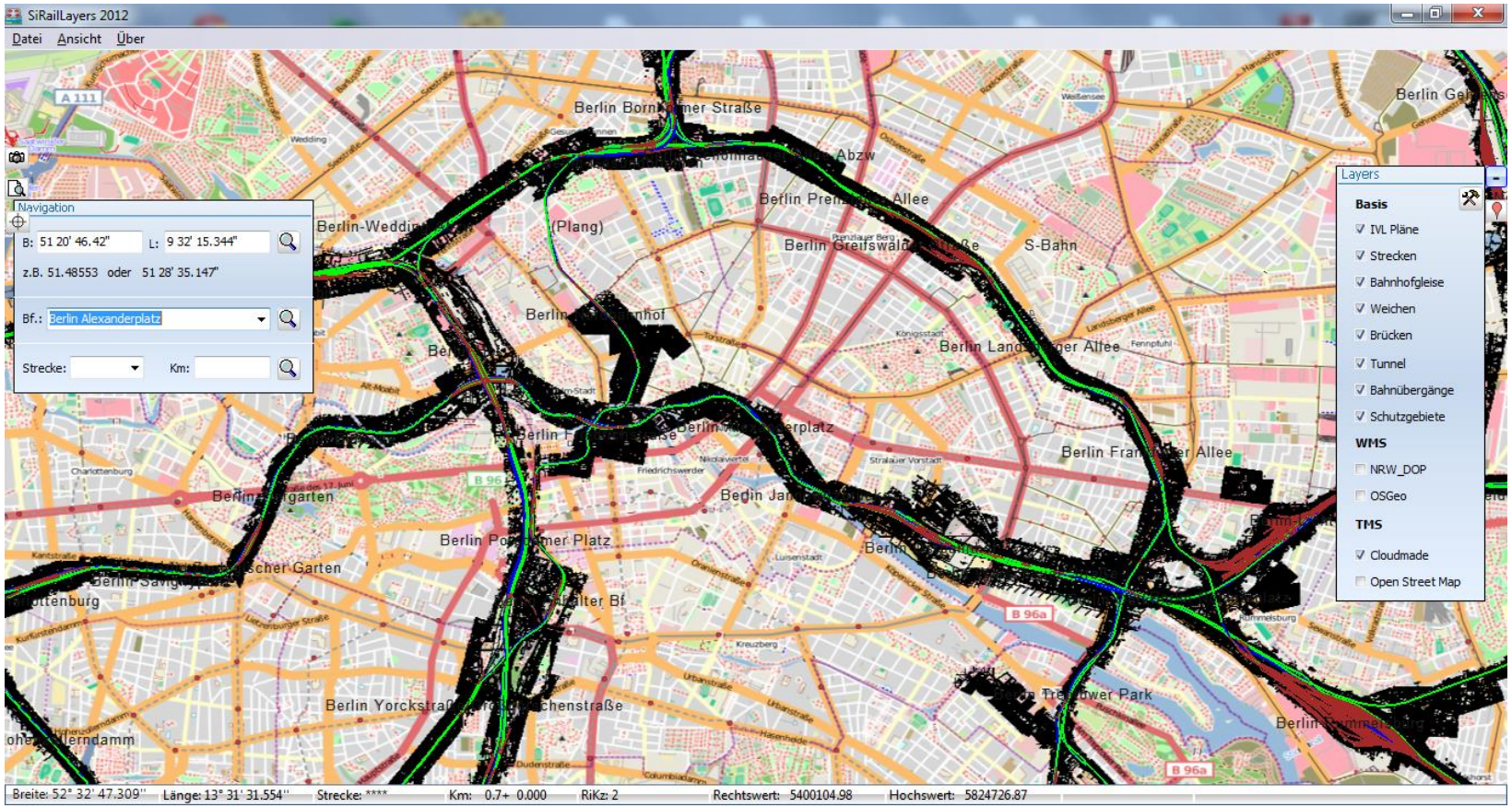
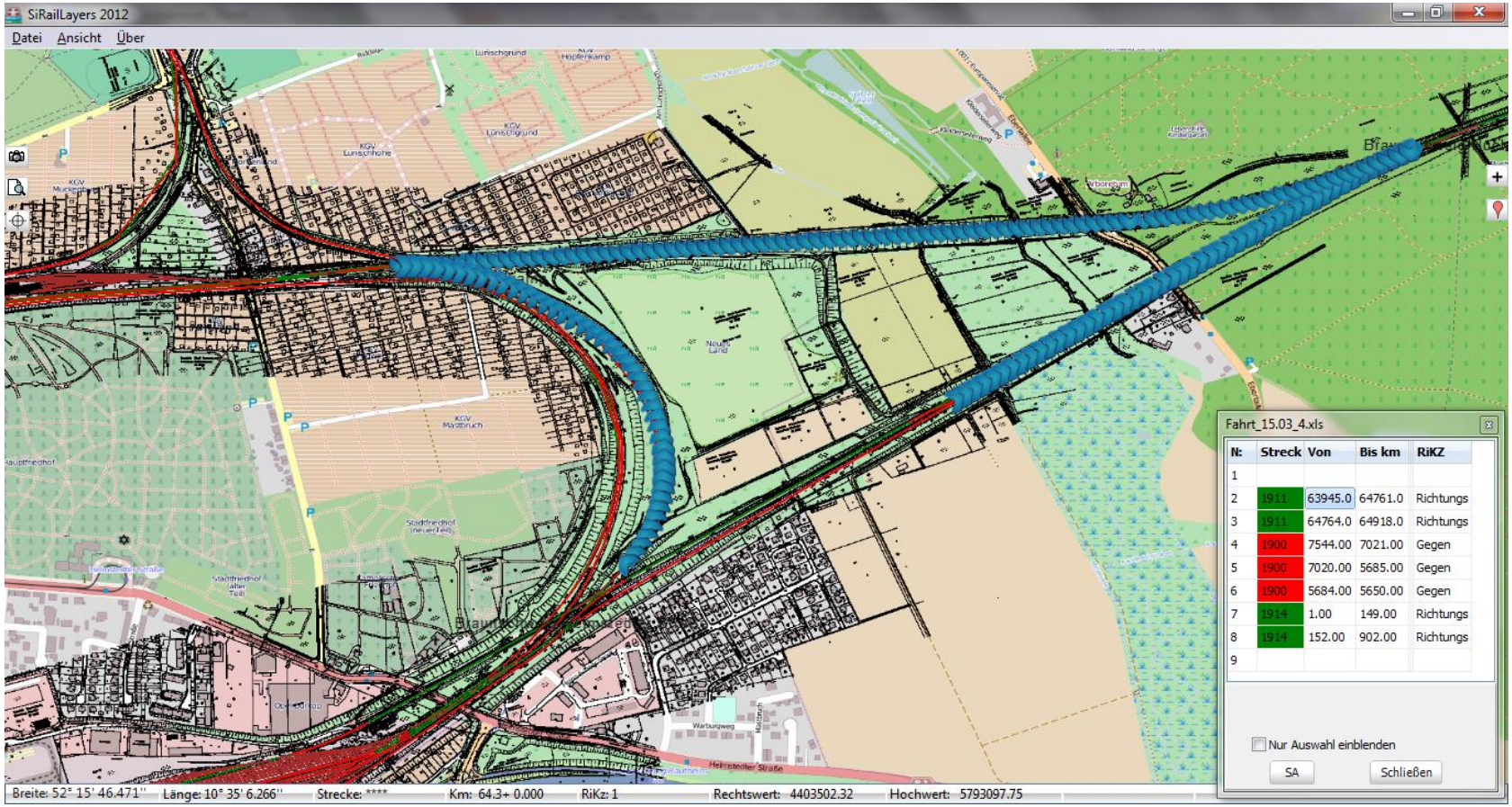
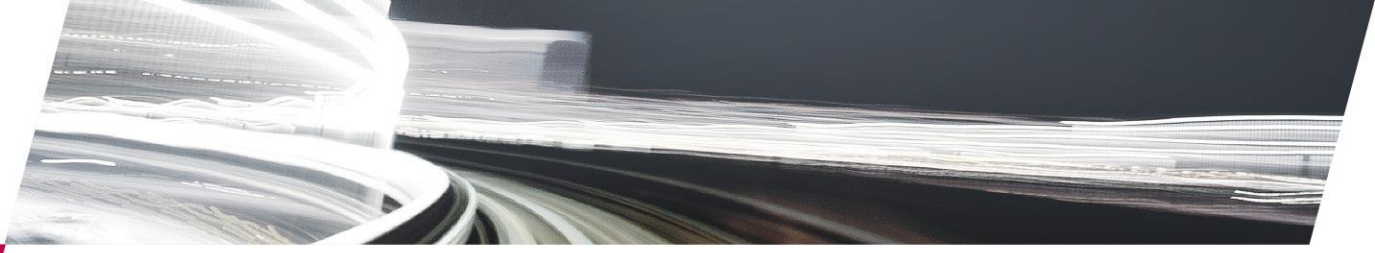


SiRailLayers



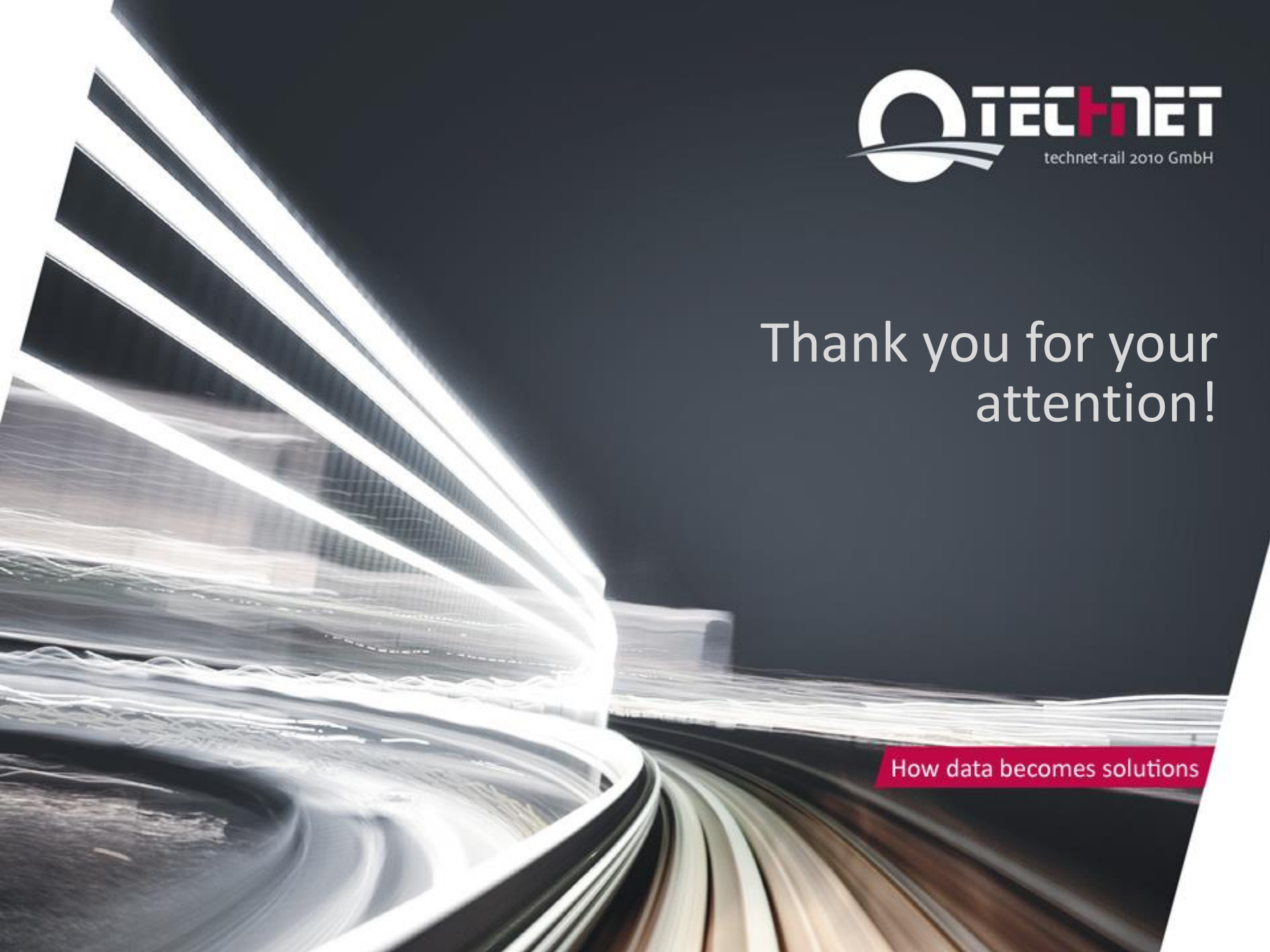
SiRailLayers - Measuring route planning





Conclusion

- Hardware: fully-calibrated and integrated measuring system – quick setup – mm accuracy
- Complete **automated** processes in real time and post processing
- Mounting configuration of Laser Scanners allows acquisition of traffic signs perpendicular to trajectory
- Reliable survey of the environment – analysing in 3D – clearance analysis, collision tests, distances, extract geometrical elements
- 3D spatial data based on several data sources/ single **databases**
- **Harmonized** information system for GNSS based navigation and maintenance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Thank you for your attention!
How data becomes solutions