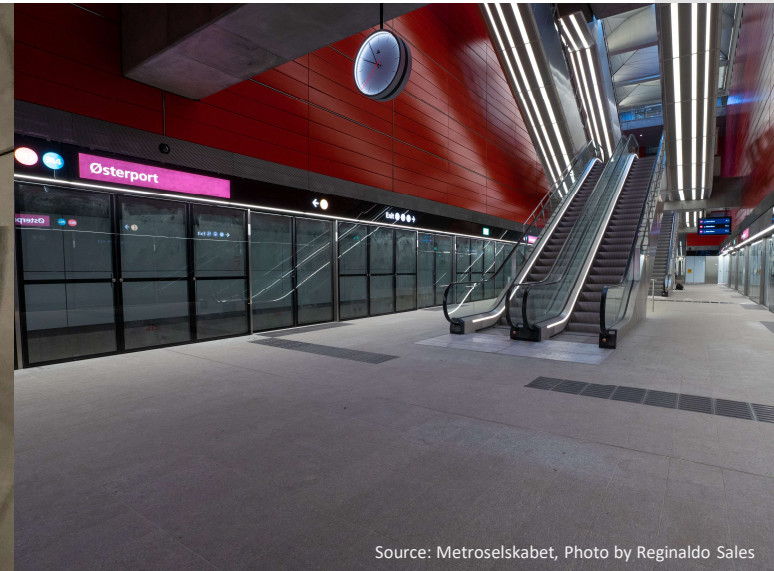




Enabling Future Mobility



# DIGITAL TOOLS & SERVICES



Ralf Sommer

Head of Digital Rail Services

Questions:  
Title:

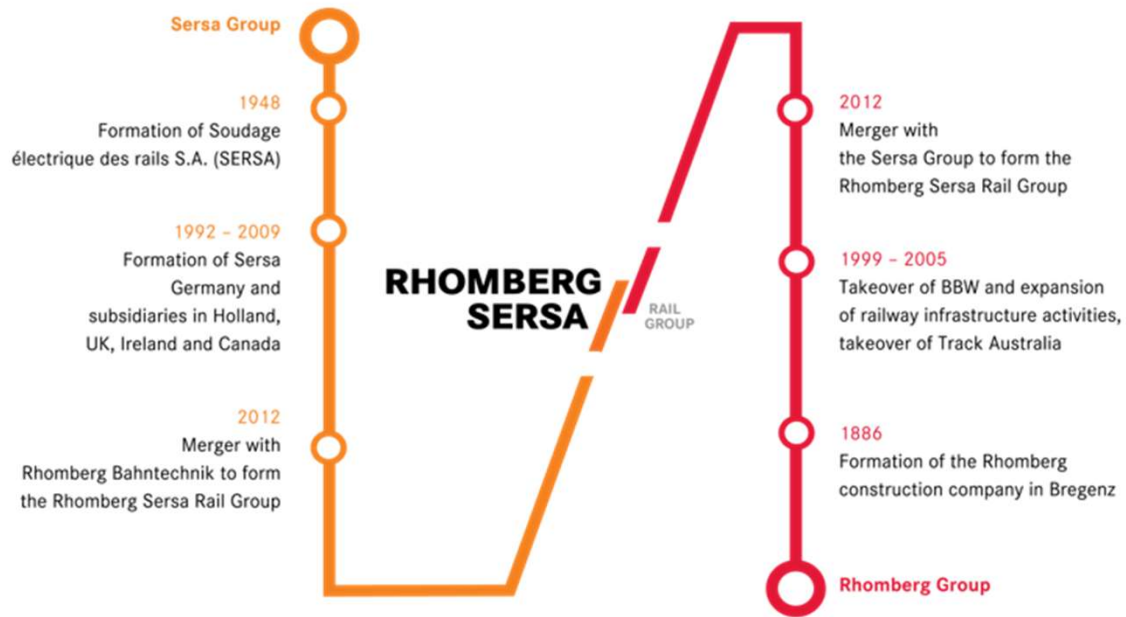
[info@rsrg.com](mailto:info@rsrg.com)  
Enabling Future Mobility

# RHOMBERG SERSA RAIL GROUP

## HISTORY



a success story goes on.

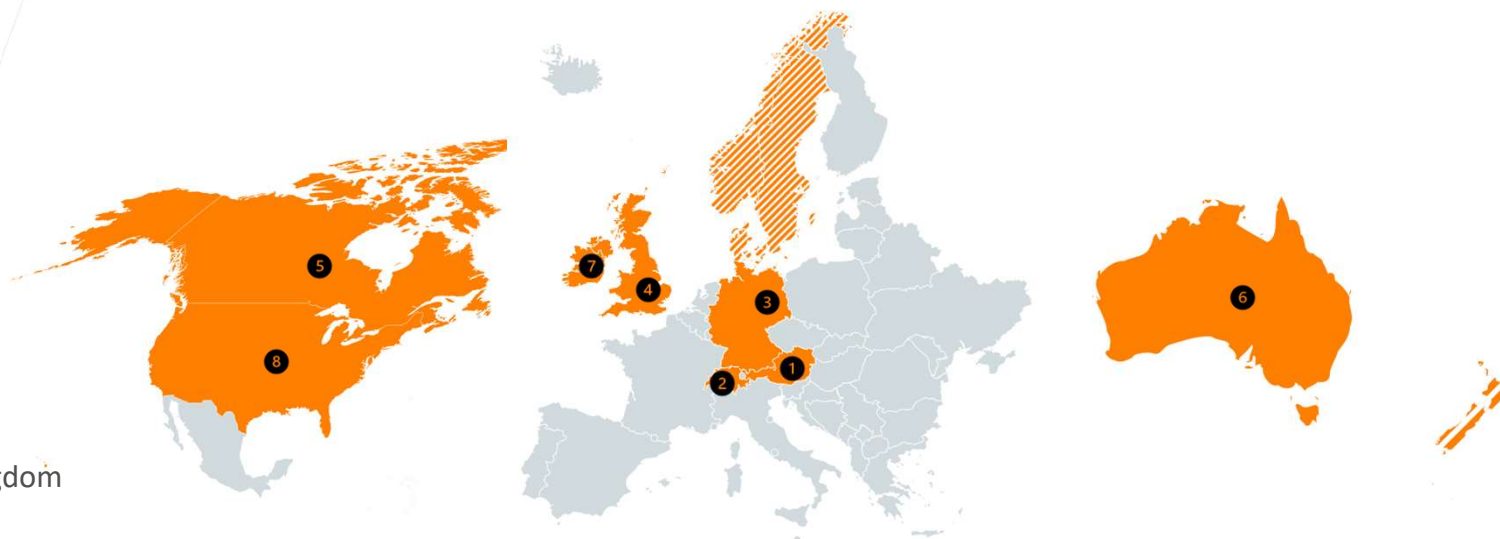




# RHOMBERG SERSA RAIL GROUP

## INTERNATIONAL PRESENCE

- 1 Austria
- 2 Switzerland
- 3 Germany
- 4 United Kingdom
- 5 Canada
- 6 Australia
- 7 Ireland
- 8 USA



**ENABLING FUTURE MOBILITY**

**NLRA WEBINAR PROGRAM #3: DIGITAL TOOLS AND SERVICES**



**DIGITAL RAIL  
SERVICES**

Ralf Sommer – Head of Digital Rail Service  
Rhomberg Sersa Rail Group – Bregenz, Austria

Contact:

[ralf.sommer@rsg.com](mailto:ralf.sommer@rsg.com)

+43 664 828 0766

## THE KEY SUCCESS FACTORS TO DELIVER HIGH PERFORMANCE PROJECTS



### Human Resources

**Well trained, experienced, and motivated staff** is the key

### Machines & Equipment

**State of the art** machines, fit for purpose

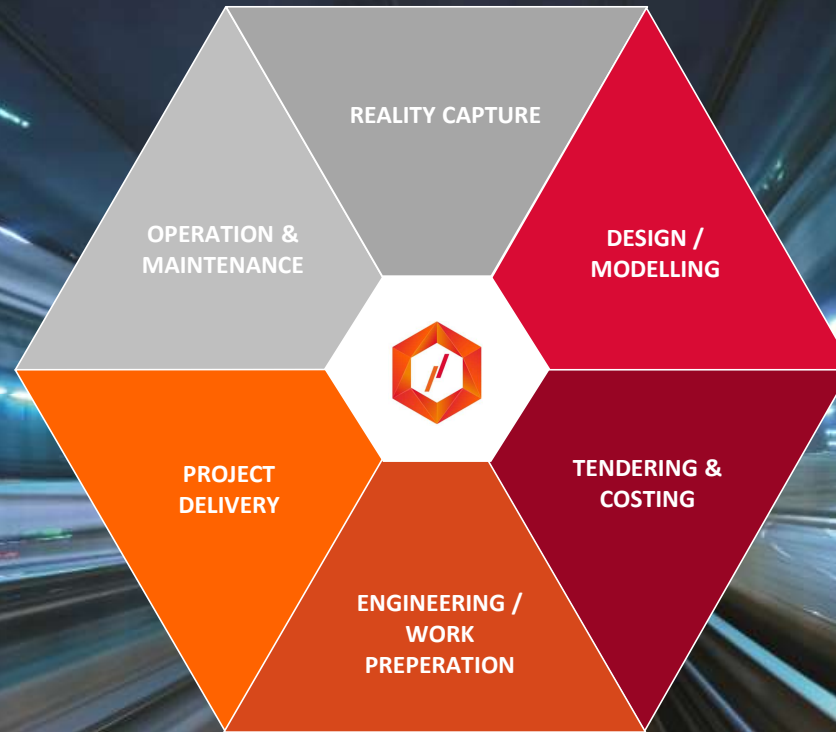
### Digitalisation

**Utilise Digitalisation** to optimize processes along the project life cycle

# Digitalisation along the Project Lifecycle

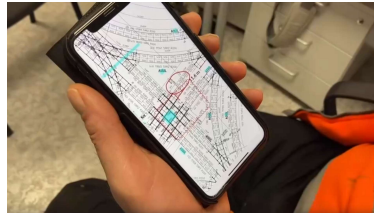


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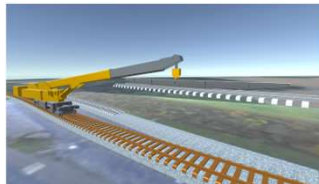




# BIM @ RSRG supports "from Construction to Production"



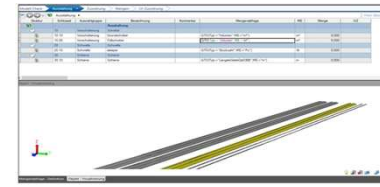
**Project Delivery Platform, with Apps**



**4D Process- & Logistic Simulation**



**4D Program Planning**



**Model Based Costing (5D)**



**Machine Control / Robotic**



**Real Time Digital Twin of Construction (IOT)**

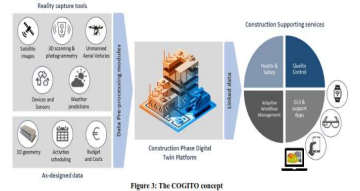
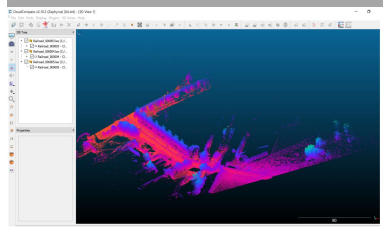


Figure 3: The COGITO concept

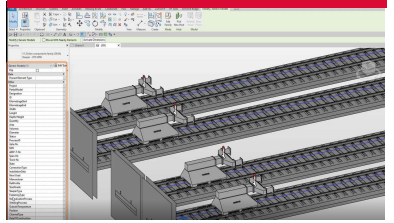
**Controlling Dashboard & Room**



**Reality Capture**



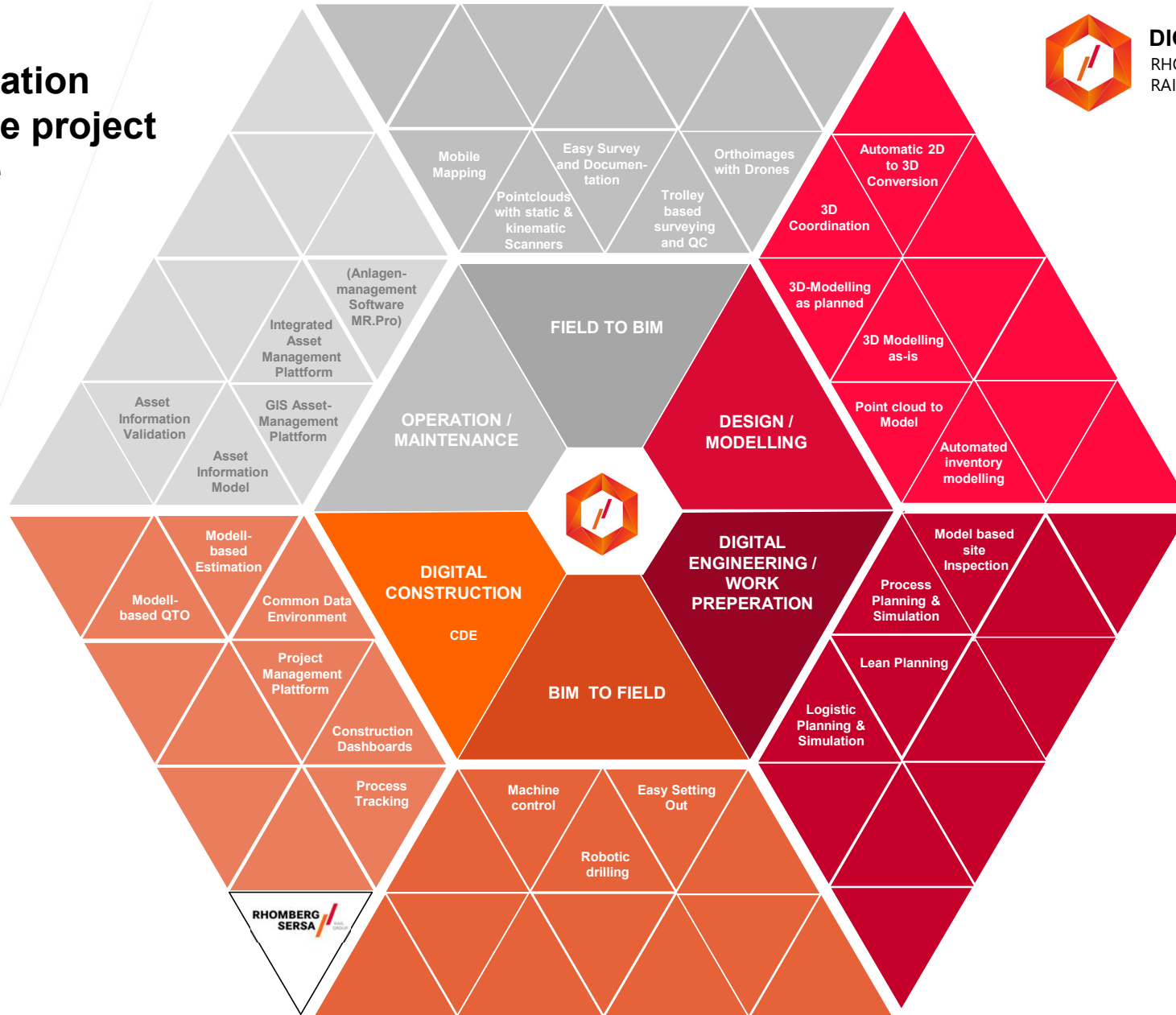
**Design & Modelling (3D)**



# Digitalisation along the project lifecycle



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RHOMBERG SERSA  
RAIL GROUP



**RHOMBERG SERSA**

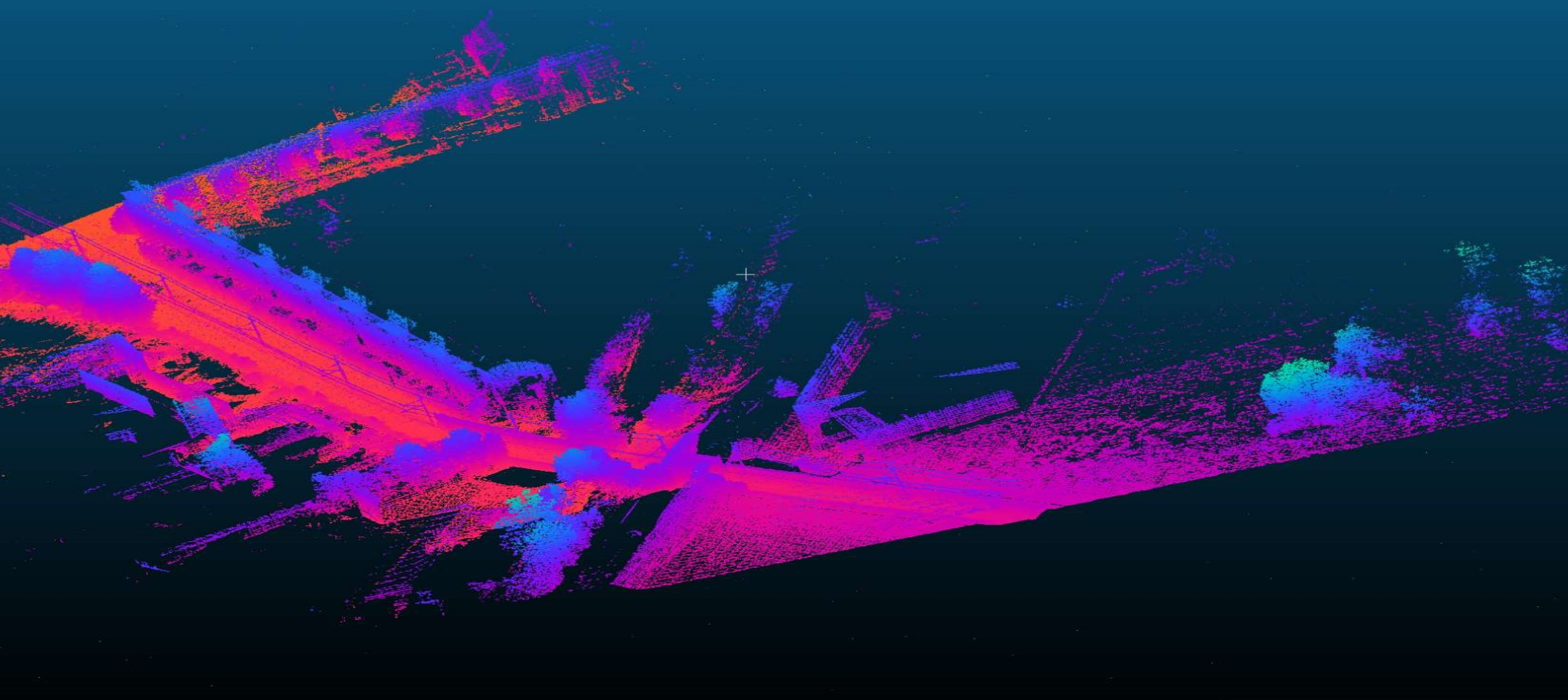
**RHOMBERG SERSA** RAIL GROUP



# Reality Capture

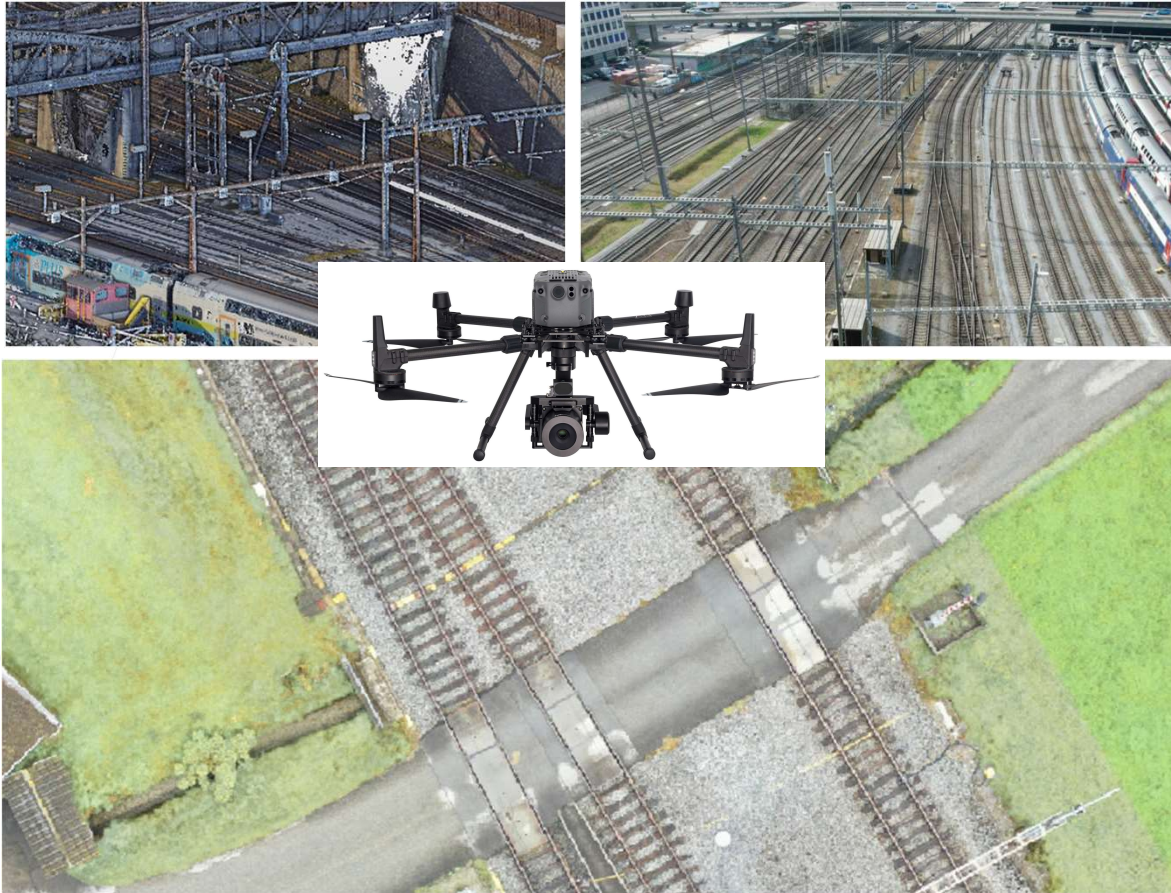


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SERVICES



# POINT CLOUDS & ORTHOIMAGES WITH DRONES

## CAPTURE REALITY FAST



### BUSINESS CHALLENGE

- Conventional surveying requires a lot of manual work
- Limitation of points to capture due to time
- Limitation of height

### OUR SERVICE

- High end reality capture products
- 3D analyses like clearance profile, catenary position or mapping of assets
- Asset inventory capturing and documentation for asset database

### VALUE / ADVANTAGE

- ✓ Precise and up to date point clouds & orthomosaics
- ✓ Efficient capturing method and high security without the demand to work on the track
- ✓ Base data for further models and analyses



# POINT CLOUDS WITH STATIC & DYNAMIC SCANNERS

## CAPTURE REALITY FAST & PRECISE FOR BETTER PLANNING



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### BUSINESS CHALLENGE

- Capture the situation in an area-based manner
- Traditional surveying is time intensive

### OUR SERVICE

- Capture data in a kinematic and track bound manner
- Processing of the data
- Provide a georeferenced point cloud
- Generate Meshes out of point clouds

### YOUR VALUE / ADVANTAGE

- Excellent base for as-is / as-built modelling
- Documentation of As-Is
- Possibility to take measurements
- Semi-automated object detection

# FRONT VIEW MEASUREMENT / MOBILE MAPPING

## CAPTURE REALITY FAST & PRECISE FOR ASSET MANAGEMENT



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### BUSINESS CHALLENGE

- Many assets are not mapped and in no database
- Setting up and maintaining an asset database is very time consuming and challenging

### OUR SERVICE

- Extraction of railway infrastructure objects in front view images
- Acquisition & updating of railway asset management databases
- BIM Inventory modelling

### VALUE / ADVANTAGE

- Up to date asset management database
- BIM inventory models on demand
- Keeps asset databases up to date without reduced quality over time

# AUTOMISED QUALITY CONTROL

## CAPTURE REALITY FAST & PRECISE FOR ASSET MANAGEMENT



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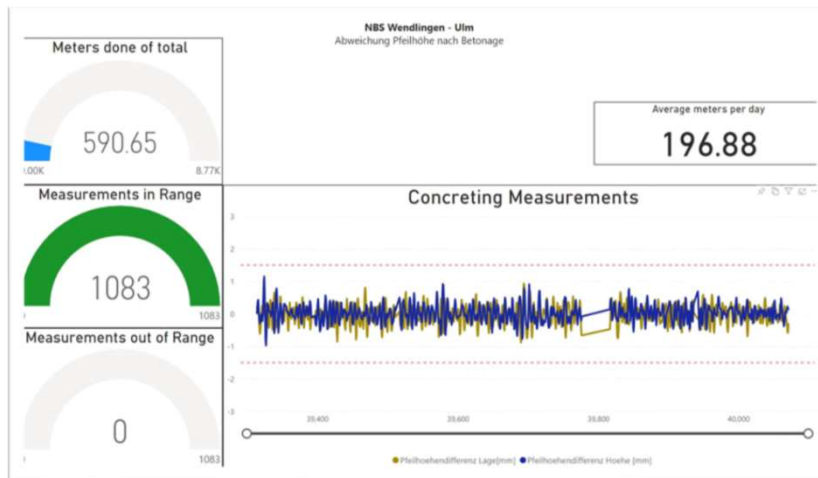


### BUSINESS CHALLENGE

- Slab Track requires high accuracy
- Adjusting Track after concrete cured requires high effort

### OUR SERVICE

- Real time quality control with Gedo Trolley
- Warning if out of tolerance
- Documentation of as-build track geometry

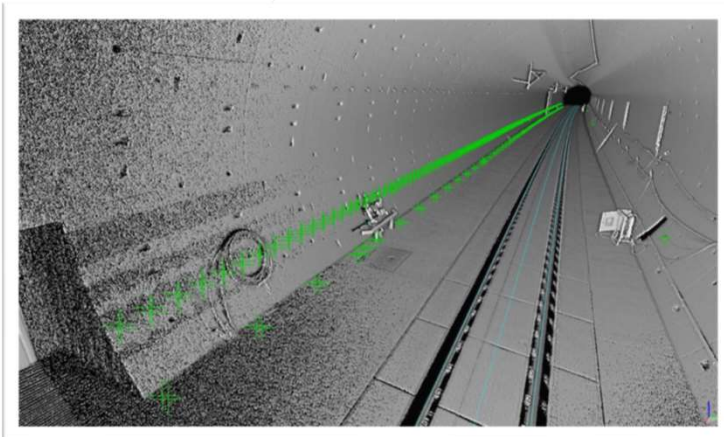


### VALUE / ADVANTAGE

- Possibility to adjust track in construction phase
- High Quality track



# ROBOTIC AUTOMISED & PRECISE DRILLING



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## BUSINESS CHALLENGE

- Tunnels require a big number of fastenings / holes
- Drilling holes is a time consuming & unhealthy task

## OUR SERVICE

- Scan tunnels
- Establish drilling patterns for robots
- Setup fix points for drilling robot

## VALUE / ADVANTAGE

- Improved Health & Safety
- Improved Efficiency

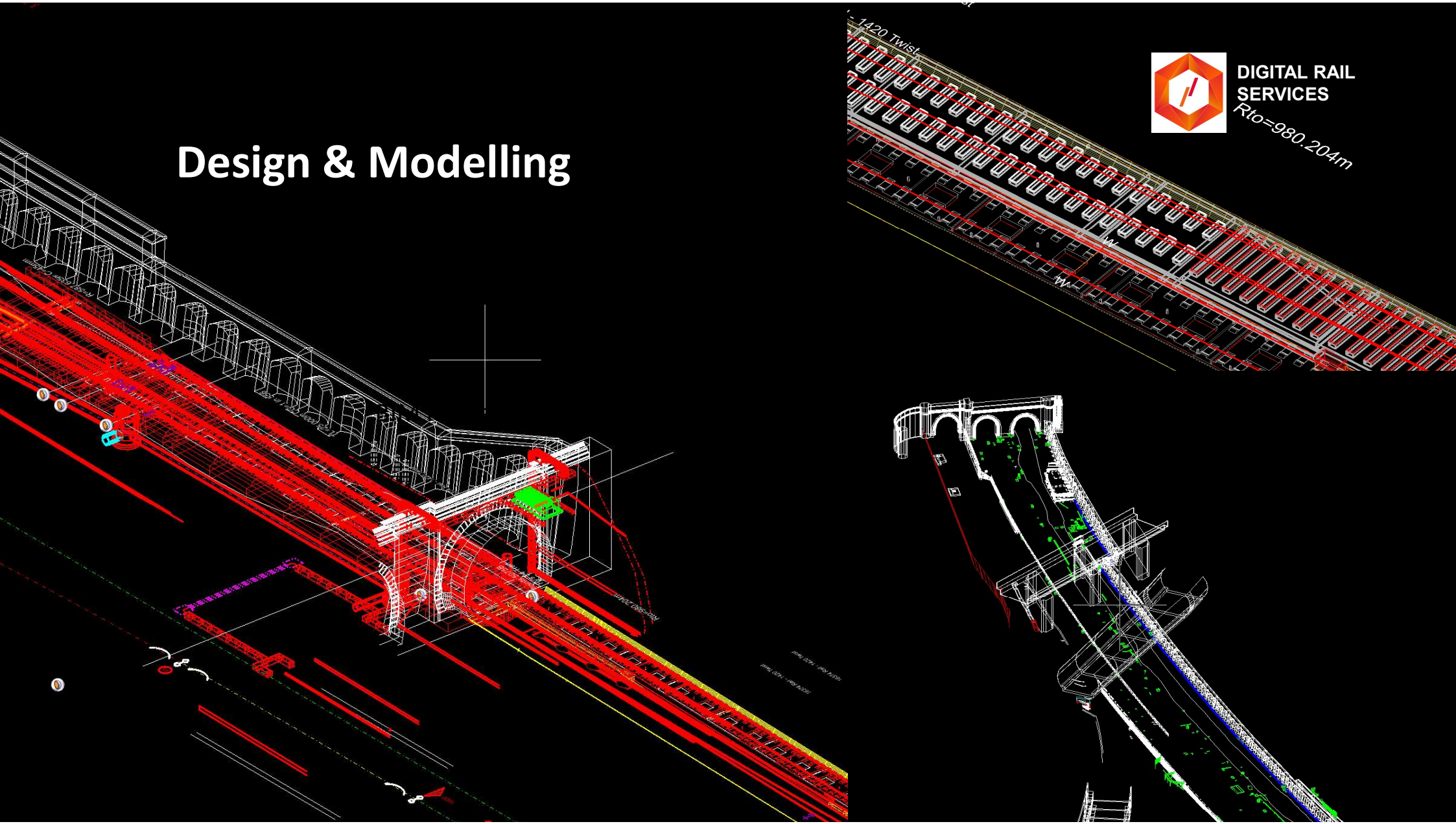


# Design & Modelling



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$R_{to}=980.204m$

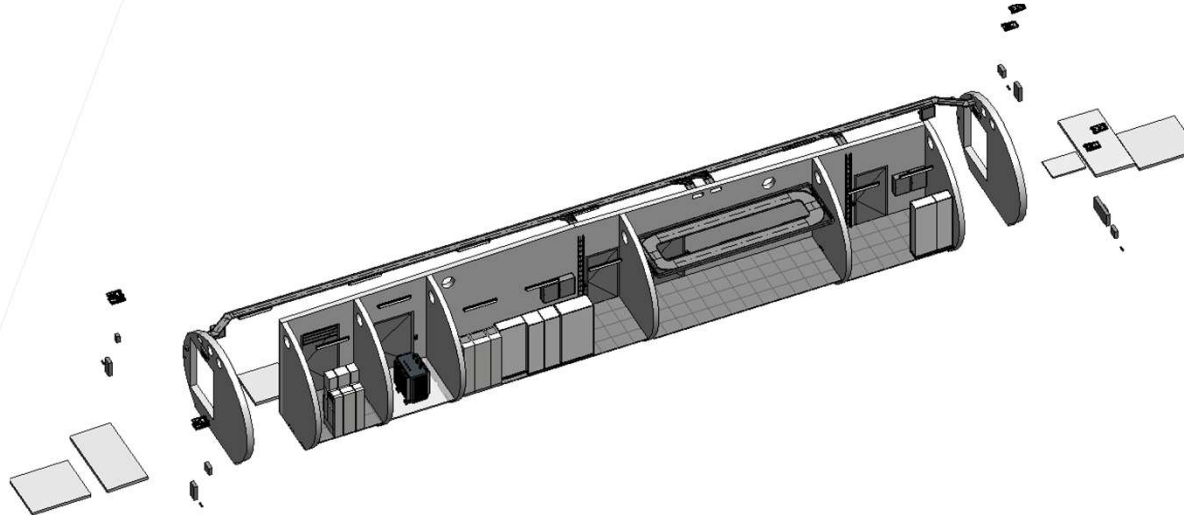
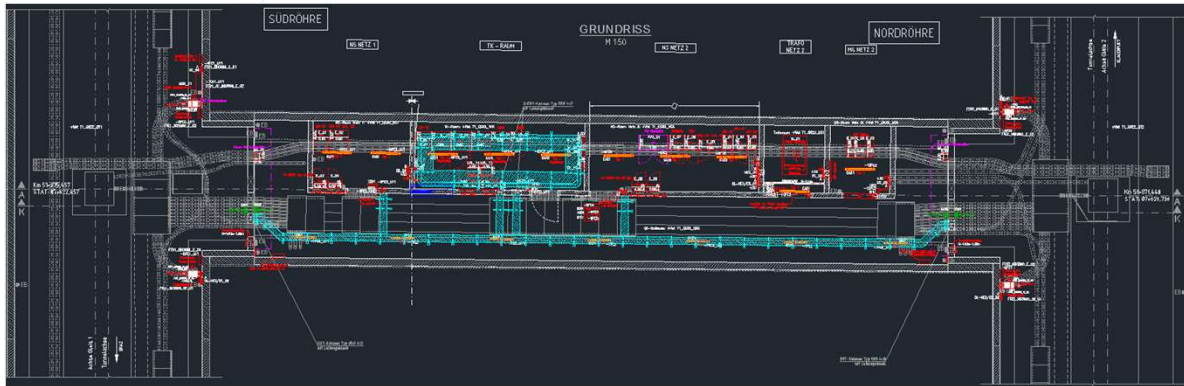


# AUTOMATED 2D TO 3D CONVERSION

## SAFE TIME & MONEY



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### BUSINESS CHALLENGE

- Generate accurate 3D models based on 2D design drawings in a timely manner

### OUR SERVICE

- Automate 3D modelling based on existing 2D DWG
- Validate the 3D output against the 2D contractually agreed input

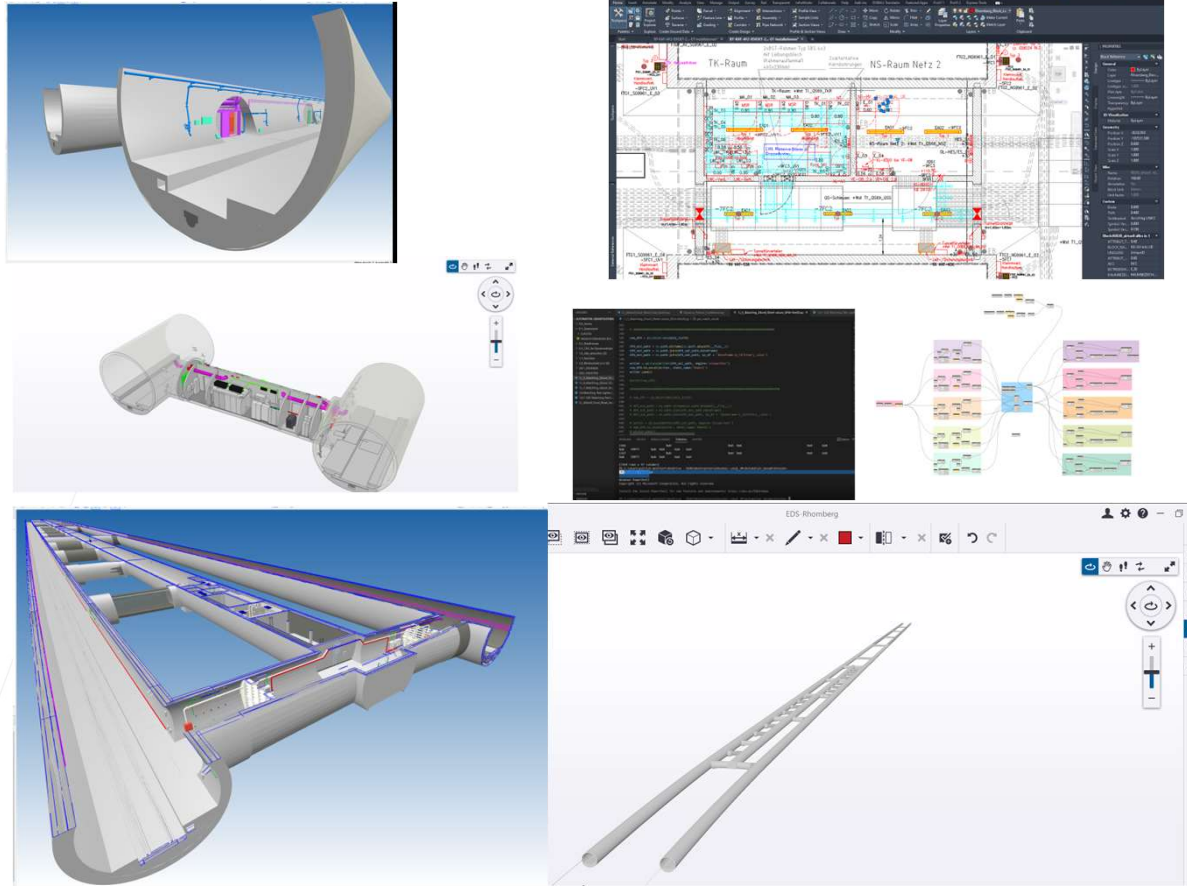
### VALUE / ADVANTAGE

- Improve productivity
- Standardization of the geometrical output

# 3D MODELLING MODELING CLIENT INFRASTRUCTURE PROJECTS



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## BUSINESS CHALLENGE

- The inventory model is a mandatory prerequisite for any sustainable planning process
- Very high effort for manual data capture and conventional modelling of facilities

## OUR SERVICE

- Efficient asset modelling with existing data
- Supplementing the model with all essential information for the execution and facility Management

## VALUE / ADVANTAGE

- Efficient model production in time focus
- Quick model delivery
- Valuable for all sizes of projects
- Minimizing failures by automatising processes

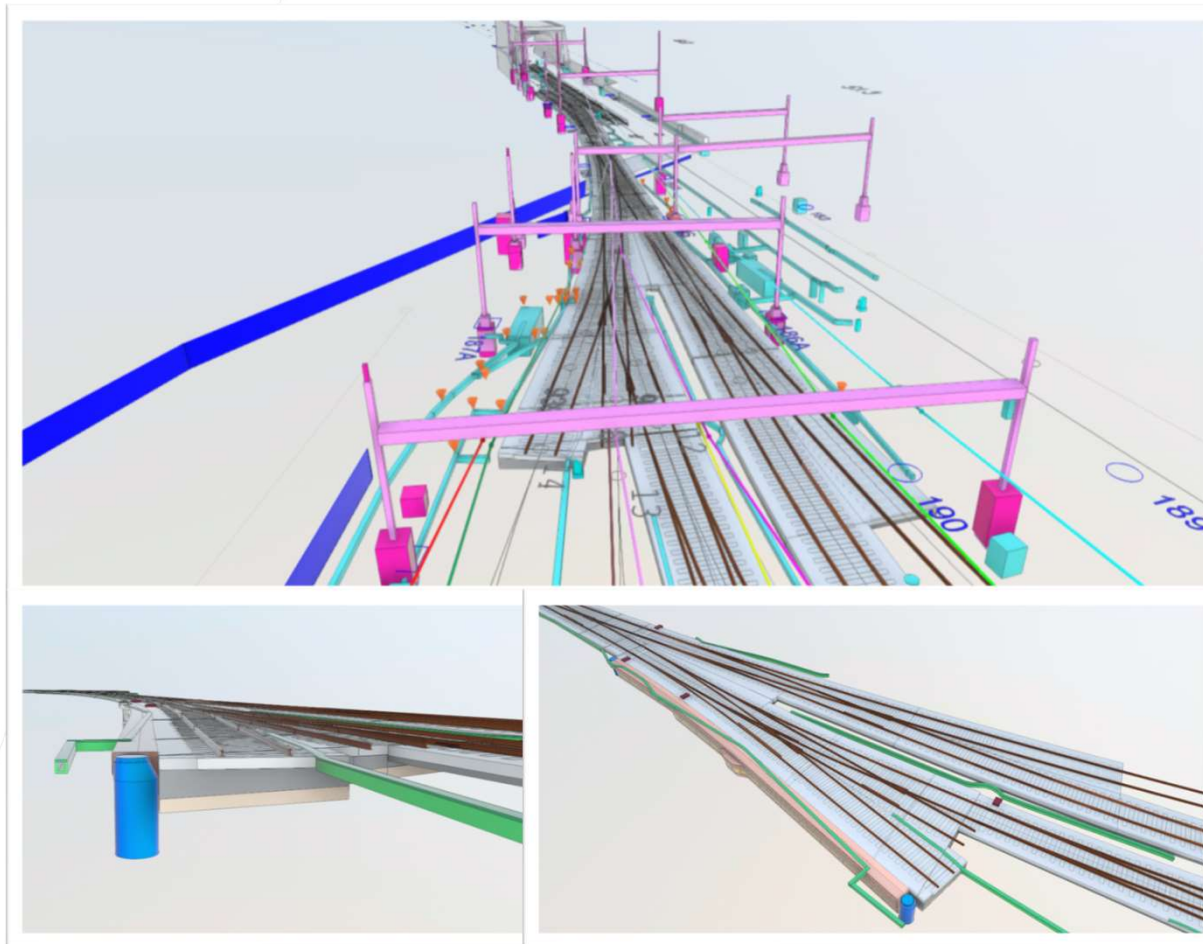


# 3D MODELLING AS-PLANNED

## CREATE MODELS AS A BASIS FOR BIM USES



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### BUSINESS CHALLENGE

- Making the 3D BIM model the only level of communication and collaboration, even in a project with 2D planners involved

### OUR SERVICE

- Automated model generation out of conventional planning data. Realized with visual programming and scripting

### VALUE / ADVANTAGE

- Efficient model production in time focus
- Better collaboration from beginning
- Less Mistakes (Clash Detections)
- Process Automation (QTO, Estimation, etc.)

# POINT CLOUD 2 MODEL (AS-IS / AS-BUILT)

## CONVERTING POINT CLOUDS AUTOMISED INTO BIM MODELS



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### BUSINESS CHALLENGE

- Modelling is a manual process with the potential to optimise
- Existing GIS data can be outdated or incorrect and therefore has to be updated by surveys

### OUR SERVICE

- Automatic detection and extraction of objects in a point cloud captured by drone, scanner or mobile mapping system
- Transfer of detected objects to asset database or BIM Models

### VALUE / ADVANTAGE

- Deeply automated process of As-is, As-build model creation
- Saving extreme amounts of time of Reality Capture team on the construction site
- Reduction from manual processing to 10%

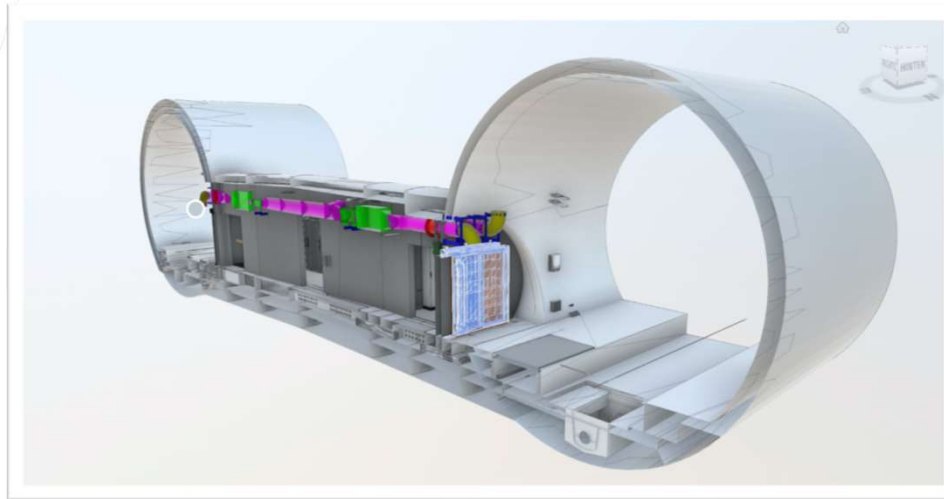


# 3D MODELLING COORDINATION

## COORDINATION FOR HIGH QUALITY DESIGN & CONSTRUCTION



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### BUSINESS CHALLENGE

- Eliminate clashes prior to fabrication, installation, or construction

### OUR SERVICE

- Identify and coordinate clashes by comparing 3D models of different systems
- Federate models produced with different authoring tools
- Identify if objects occupy the same space (hard clashes) or violate space constraints (soft clashes)

### VALUE / ADVANTAGE

- Reduced construction cost (less change orders)
- Reduce construction waste
- Increase onsite productivity



3/15/2023

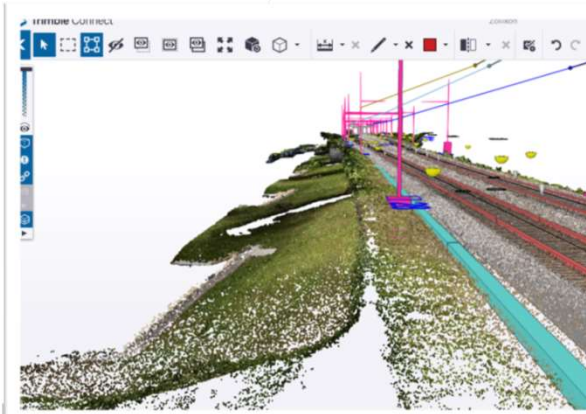
22



# VIRTUAL SITE INSPECTION INCREASES SAFETY, REDUCES TIME & CO2 CONSUMPTION



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## BUSINESS CHALLENGE

- The preliminary site inspection requires a lot of travel time, CO2 emissions and safety concerns in the operated railway asset.
- The given inspection timeframe must be used in order to evaluate all relevant aspects

## OUR SERVICE

- Reality Capture
- Modelling
- Processing of Data



## YOUR VALUE / ADVANTAGE

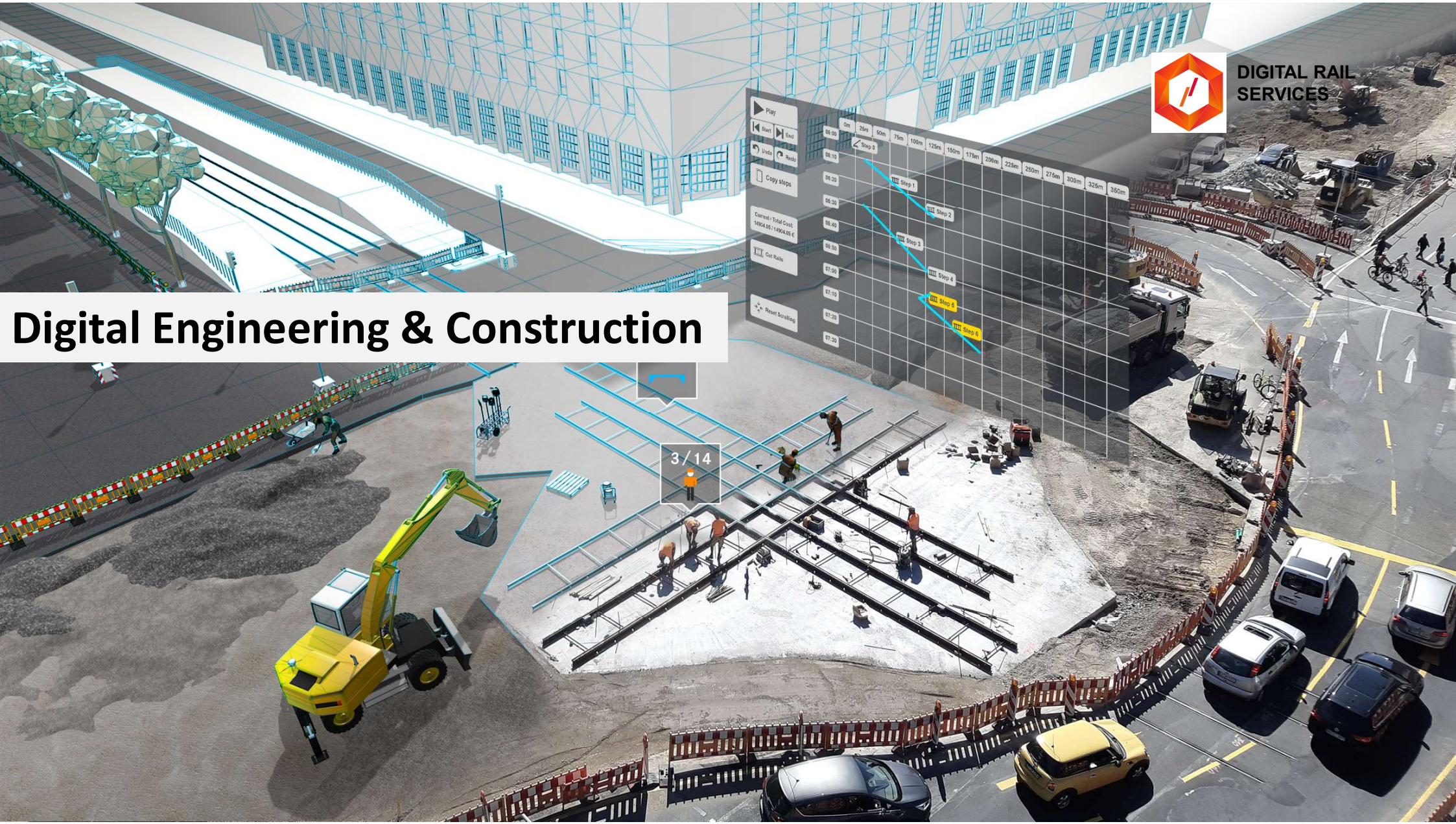
- **Safety**
- Less time on the railway asset
- **Time**
- 24/7 availability of the asset information on the platform
- No travelling time to the site





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# Digital Engineering & Construction







Tool für Bauprozessplanung  
und Simulation

Das Gezeigte entspricht einer frühen Entwicklungsversion

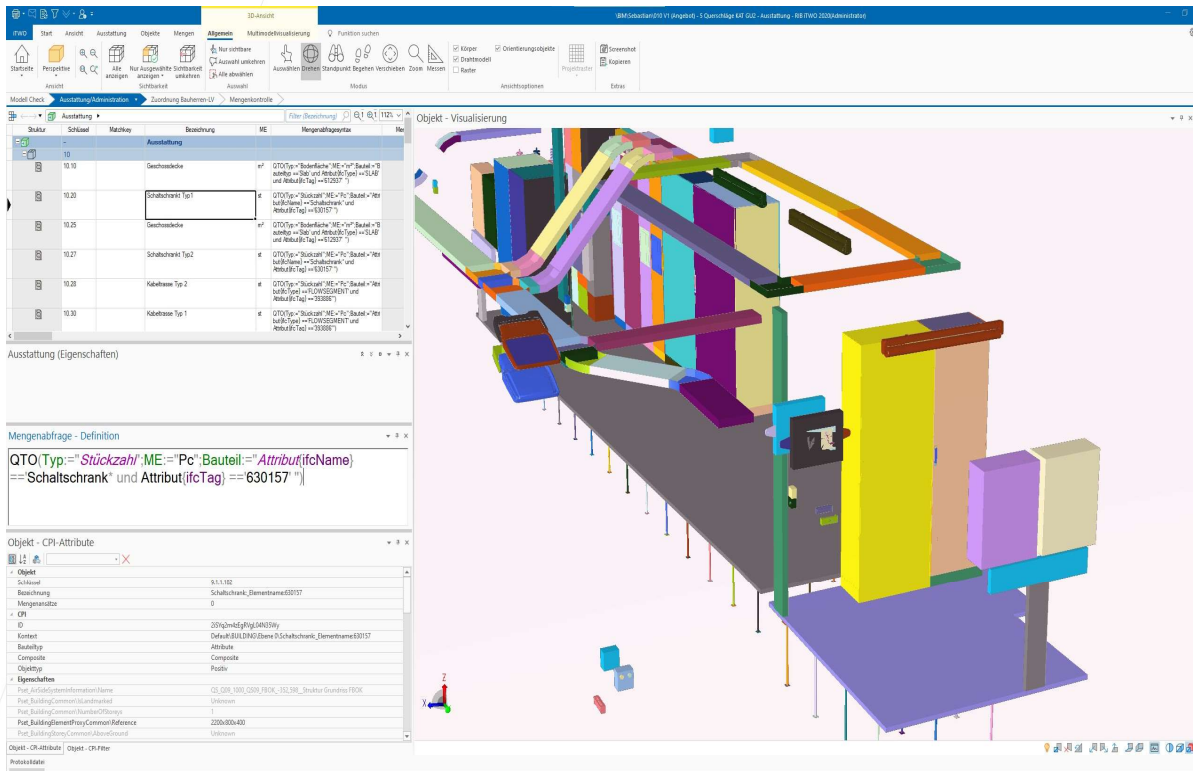


# MODEL BASED COSTING & CONTROLLING

## LINK MODEL WITH TECHNICAL ERP SYSTEM



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### BUSINESS CHALLENGE

- Extracting quantities from 2D drawings is a time consuming task

### OUR SERVICE

- Modelling of 5D models
- Model based BOQ, Quantity take Off and estimation in ITWO

### YOUR VALUE / ADVANTAGE

- Reducing time for quantity extraction
- High accuracy
- Model based QTO supports model based estimation and invoicing

# PROJECT MANAGEMENT PLATFORM

## CONNECTING TEAMS AND PROJECT DATA

### FROM DESIGN TO HANDOVER



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#### BUSINESS CHALLENGE

- Stagnant information flow
- Outdated and different information stati
- Working in silos

#### OUR SERVICE

- Defining project & site-management Processes
- Hosting, managing and maintaining a project management platform
- Digitalisation of Workflows between all stakeholders

#### YOUR VALUE / ADVANTAGE

- High efficiency in project Management
- Higher collaboration across all project team members



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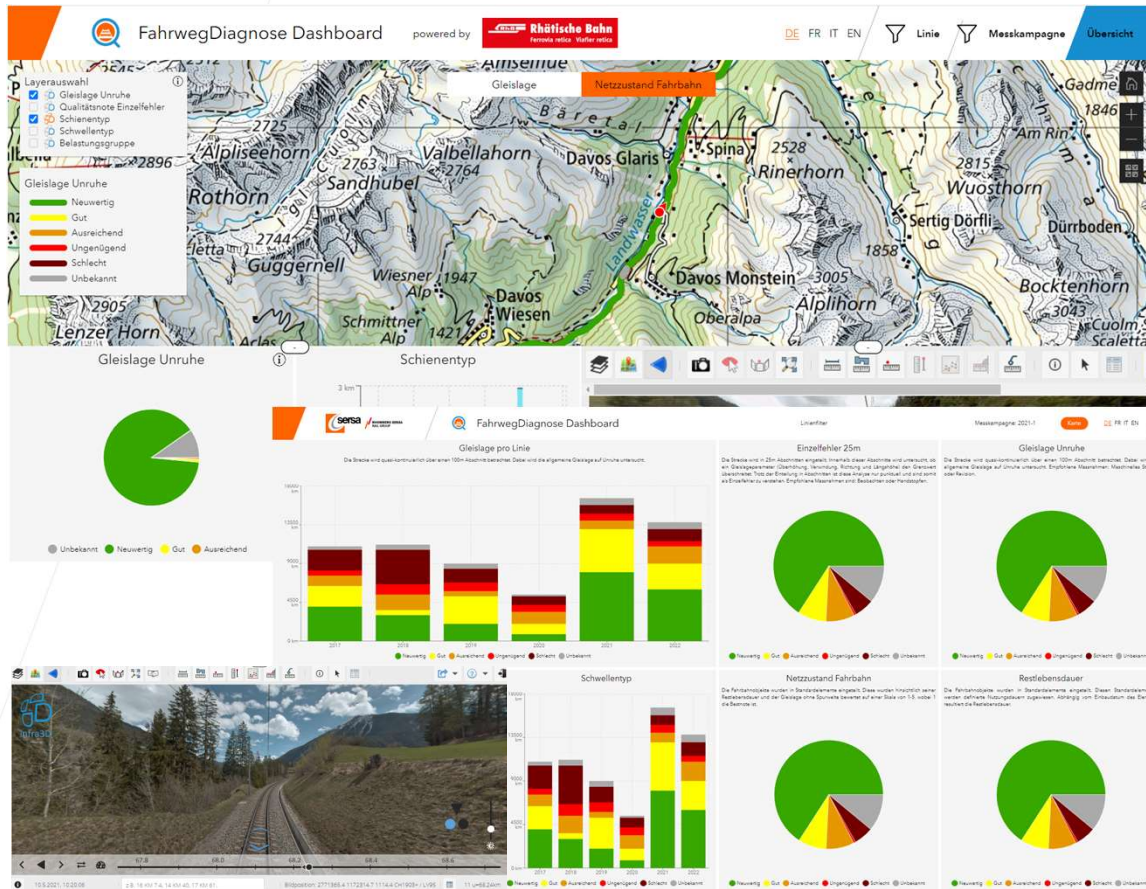


**Asset Information Management**



# GIS ASSET MANAGEMENT PLATFORM

## MAP-BASED PRESENTATION OF DATA



### BUSINESS CHALLENGE

- Increasing amount of digital spatial data
- Data accumulates in different formats and storage locations

### OUR SERVICE

- Setup GIS Plattform
- Build web-based dashboards and maps
- Interpretation and graphical representation of measurement values

### YOUR VALUE / ADVANTAGE

- Data from different sources visualized in one central location
- Reduction of software tools to access data with different formats
- Facilitates the understanding of complex data and supports decision making

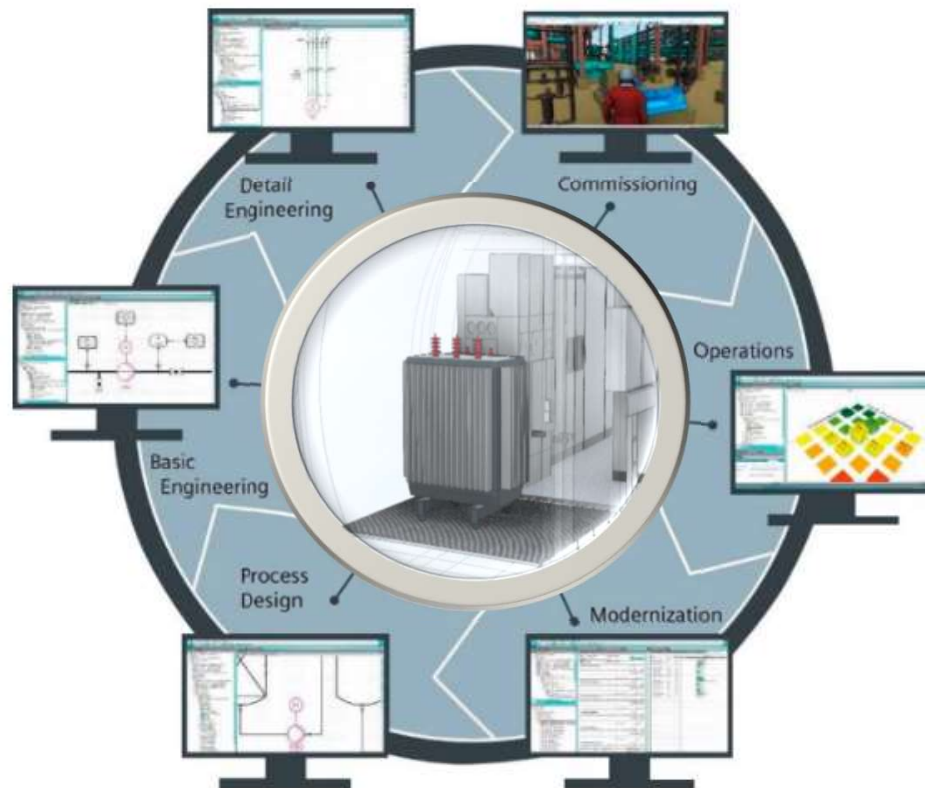
# ASSET MANAGEMENT PLATFORM FOR PLANTS & TUNNEL

## CONNECTING DIGITAL WITH THE REAL WORLD

### FOR EFFICIENT ASSET MANAGEMENT



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#### BUSINESS CHALLENGE

- Tunnels are complex plants
- Relevant information & know how is usually stored in silos or people

#### OUR SERVICE

- Establish object based asset information model
- Setup an object-oriented centralized asset management platform
- Query relevant data during design and construction phase

#### YOUR VALUE / ADVANTAGE

- Increase of > 20% productivity in asset maintenance through efficient asset information management
- Quicker training of new people



## DIGITAL RAIL SERVICES RESPECT AND DIVERSITY

### 6 Working Locations

SCHWEIZ

DEUTSCHLAND

ÖSTERREICH

UK

IRLAND

AUSTRALIEN

# 15

### Nationalities



### Different Jobs

BIM Modeller, BIM Manager, BIM Coordinator, Reality Capture Specialist, Information Manager, Data Engineer, Digital Construction Engineer, GIS & Geo Data Specialist, Process- and Logisticplaner, Lean Manager, Software Developer



ENABLING FUTURE MOBILITY  
QUESTIONS AND ANSWERS

**info@rsrg.com**

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# THANK YOU!



Enabling Future Mobility

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