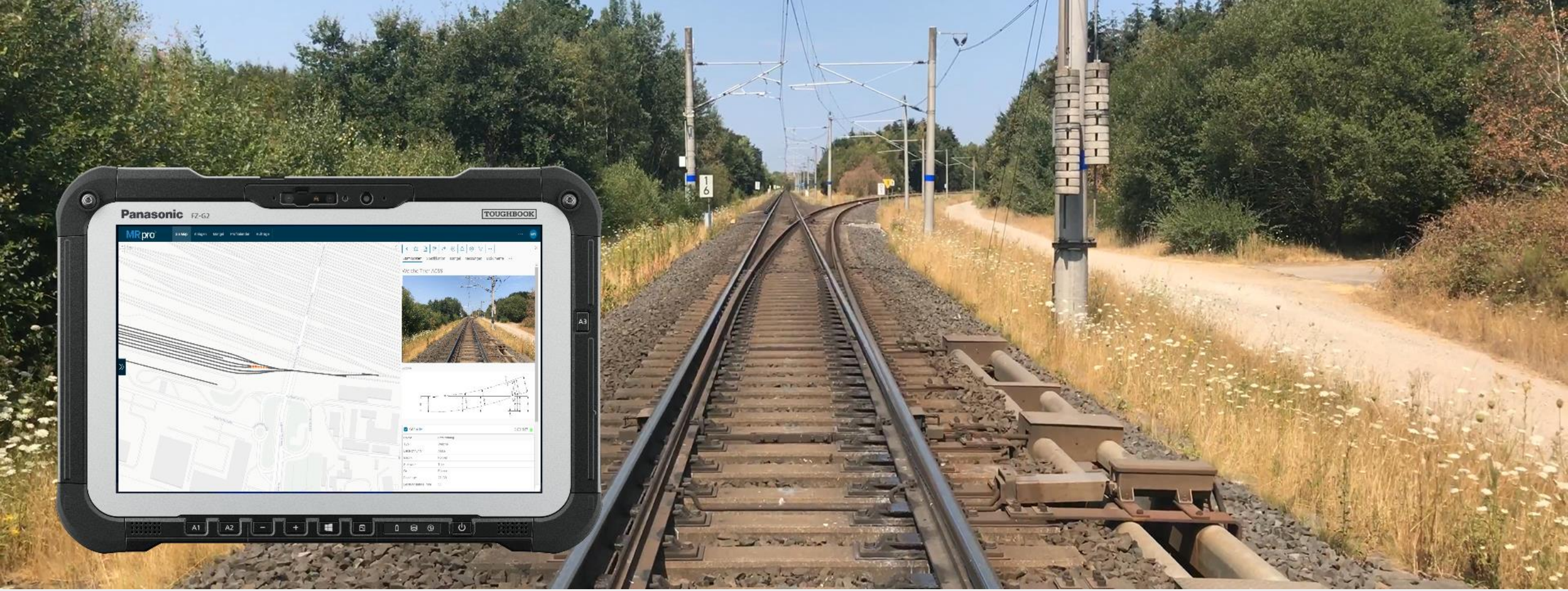


MR.pro® Infra-Data-Management Software

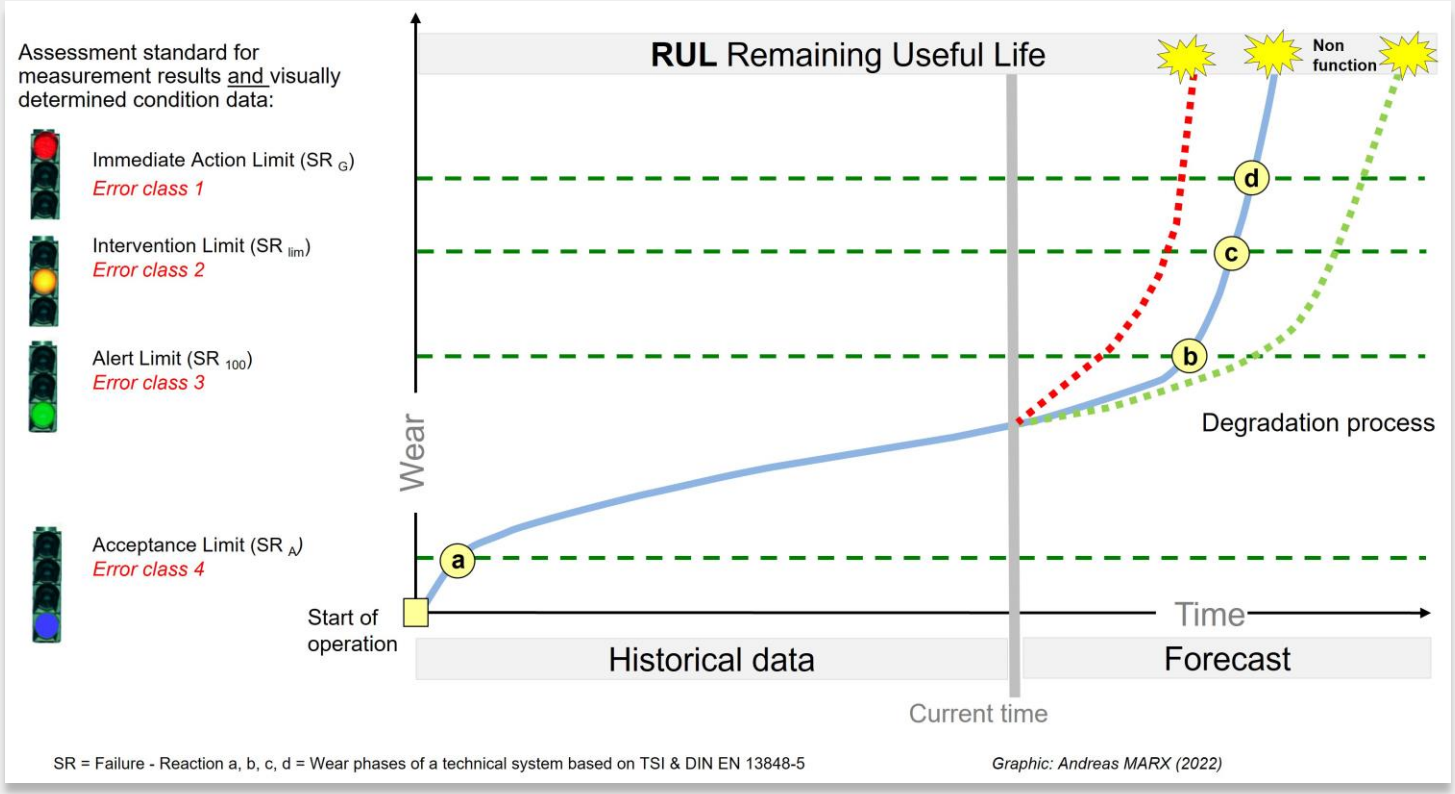
- analyze & evaluate
- decide & initiate
- document

Vision - what we want to achieve

Maximum service life for rail networks

As a joint venture between Rhomberg Sersa & Vossloh, we at RSV have extensive expertise in the construction and maintenance of rail traffic routes. With this knowledge, we support infrastructure operators in optimizing the service life in the long term.

Our focus is on maintaining existing systems in order to be able to use their inherent resources (grey energy) economically for as long as possible.



Company History

Schreck-Mieves	1904	Gründung der Paul Schreck KG in Halle/Saale,
	01.02.1994	Gründung Instandhaltung & Management als Weichen-Kundendienst in Longuich
Balfour Beatty Rail	20.06.2008	Wechsel aller Gesellschaftsanteile von der Schreck-Mieves Gruppe zur britischen BBRail plc
RS GLEISBAU Ein Unternehmen der RHOMBERG SERSA RAIL GROUP	01.02.2015	Übernahme der ehemaligen Schreck-Mieves Unternehmensteile durch die österreichisch-schweizerische Rhomberg Sersa Rail Group (RSRG)
RHOMBERG SERSA SERVICE Ein Unternehmen der RHOMBERG SERSA RAIL GROUP	01.07.2017	Ausgründung der Services-Abteilung in die Rhomberg Sersa Service GmbH, Spezialisierung auf Maintenance Solutions
RHOMBERG SERSA vossloh	01.04.2018	rückwirkend neuer Gesellschafter Vossloh Rail Services GmbH und Umbenennung in Rhomberg Sersa Vossloh GmbH (RSV)

About MR.pro®

Customer network

Urban Railways

Railroads, Indutry

5 Software Developer

Track & IT experts

>500 Daily users

F1 Inspection experts

Visuel inspection + Measurements

Analysis

Assessment

Condition

Actions

F2 Asset-management

Decision support

Visualization GIS

Wear reserve indication KAV®

Projectmanage ment

OBJECTS

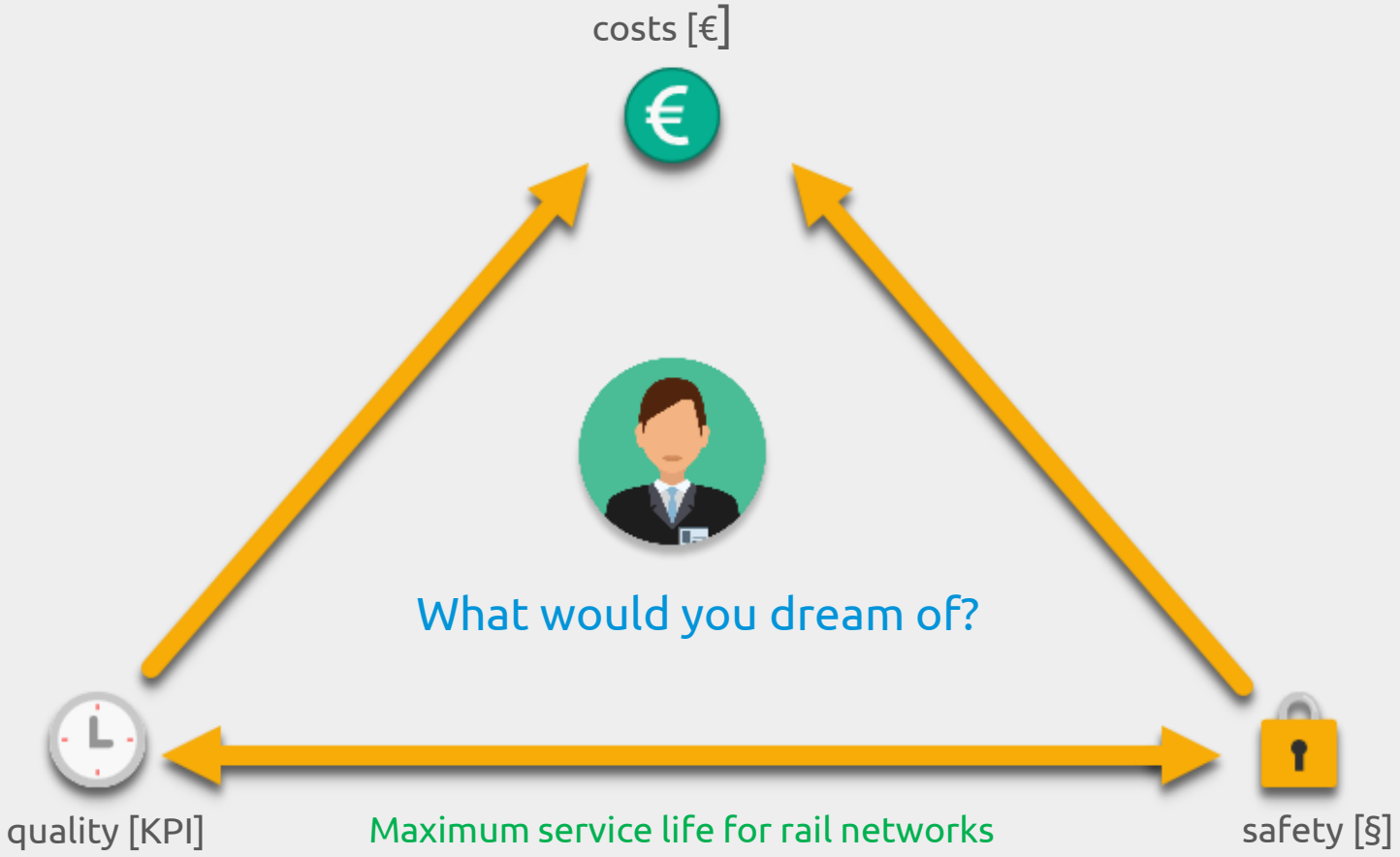
> 400 inspected networks

SINCE 2001

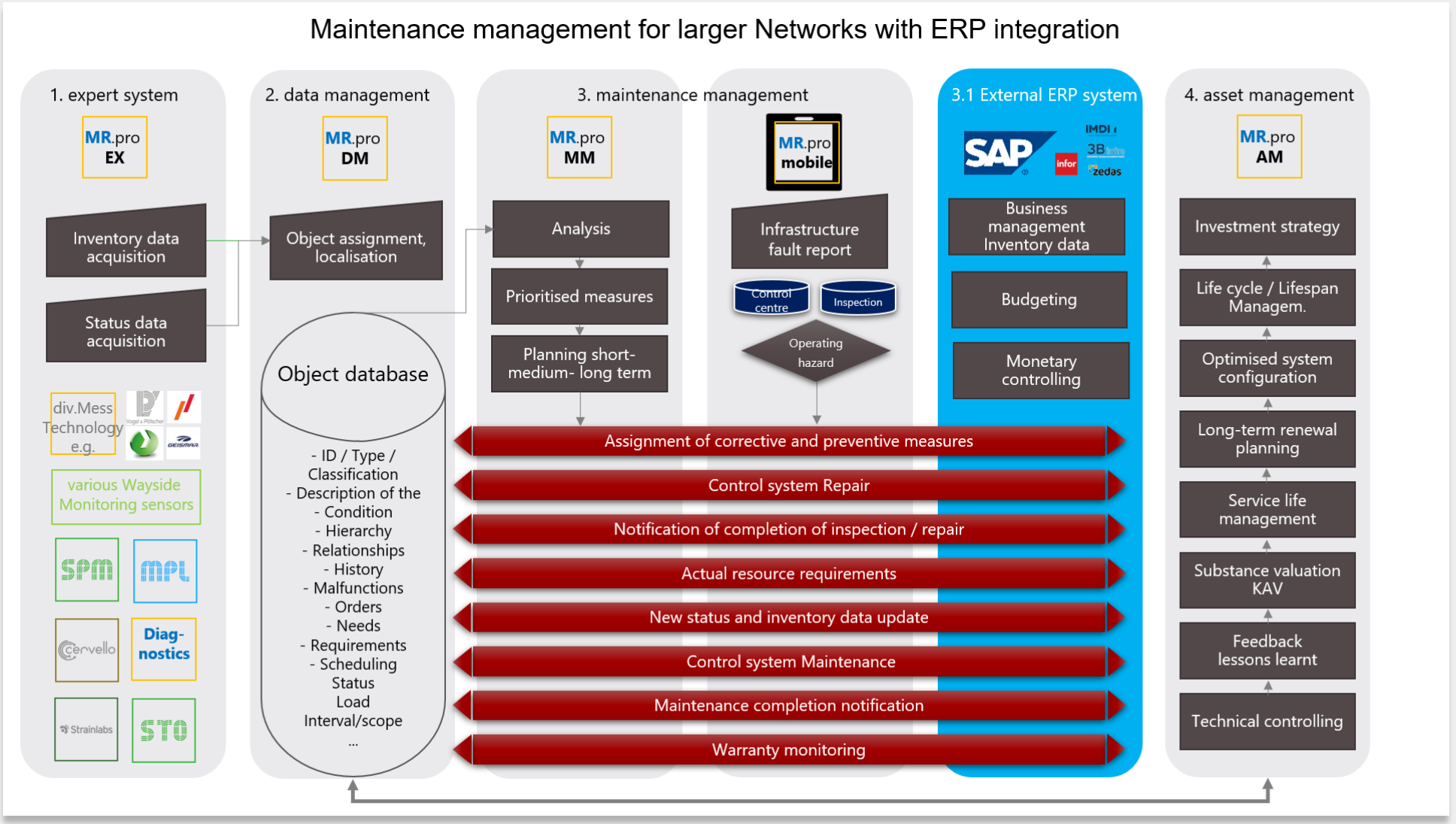
If I were... an Infrastructure Manager

Quality and safety are the basis for several KPIs:

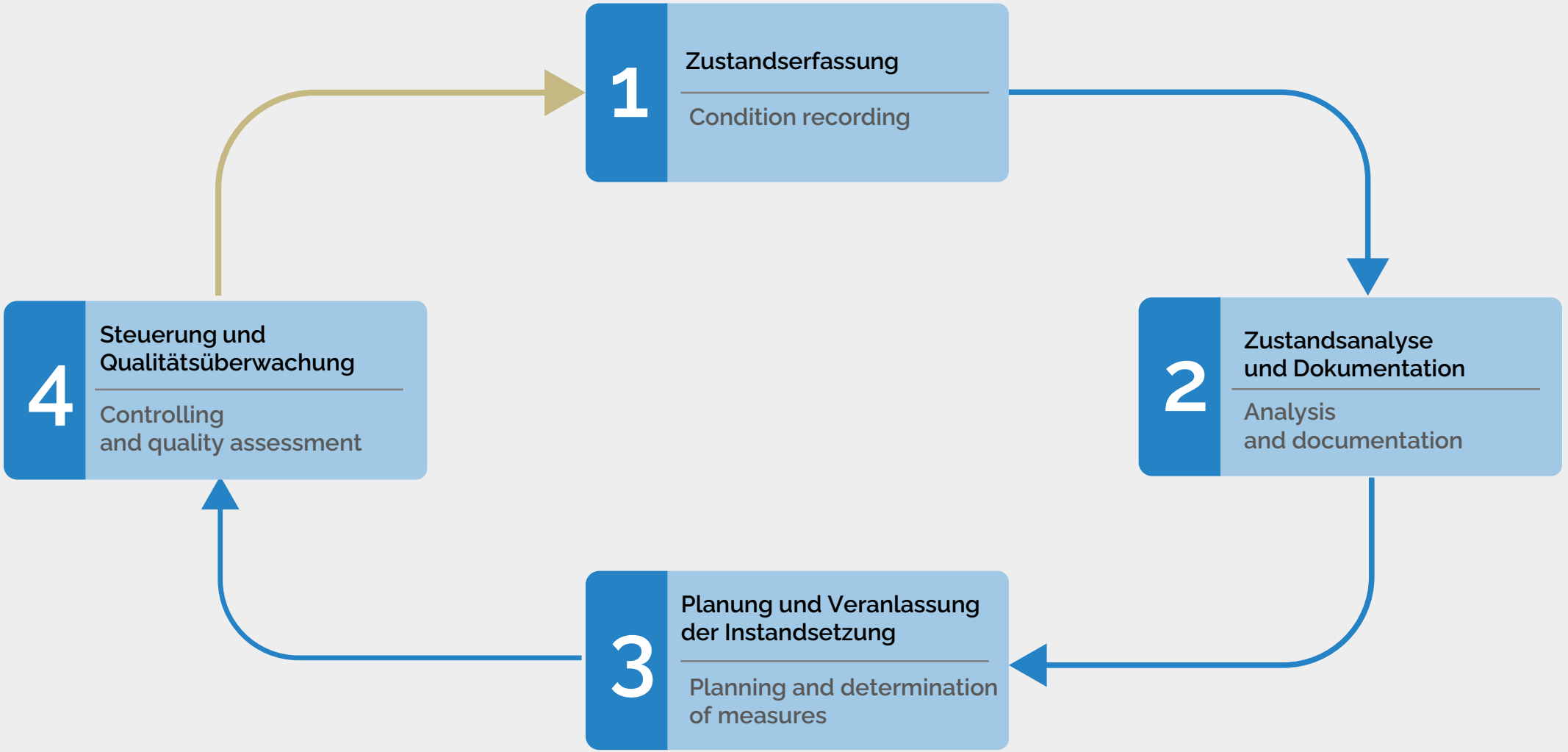
- Availability
- Punctuality
- No derailments
- Passenger comfort
- Noise and vibration
- KAV (remaining useful life)
- Correct maintenance measures



Asset Strategy

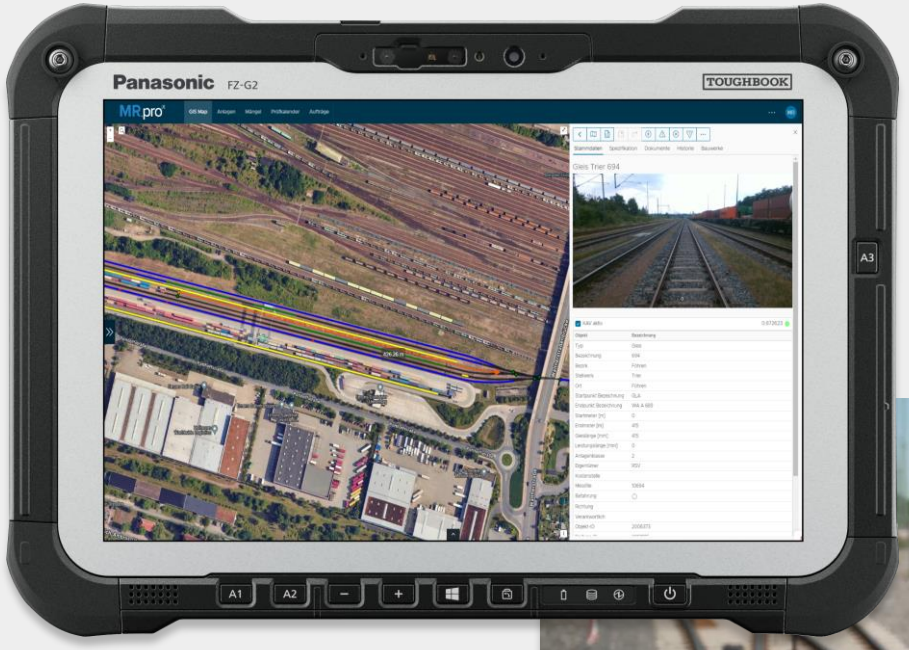


Workflow Infrastructure-Maintenance



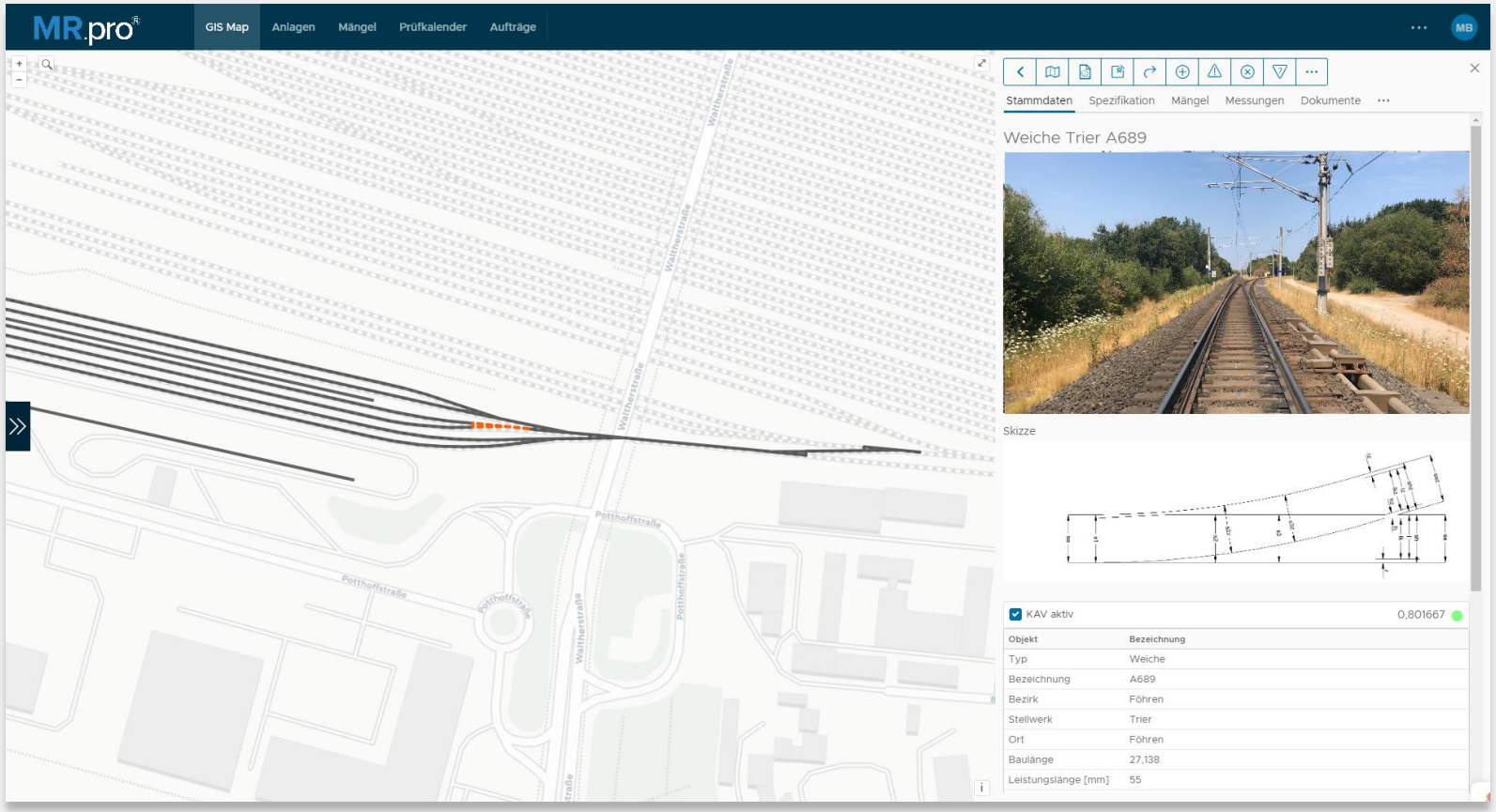
Range of services

- Inventory
- Measurement & testing
- Interfaces to measurement technology
- Condition analysis Classification
- Documentation
- Evaluation
- Commissioning
- Control system
- Feedback/final report
- Visualization
- Georeferencing
- Life history
- Substance evaluation and prognosis (KAV®)
- Individual inspection intervals
- Walkthroughs
- ……



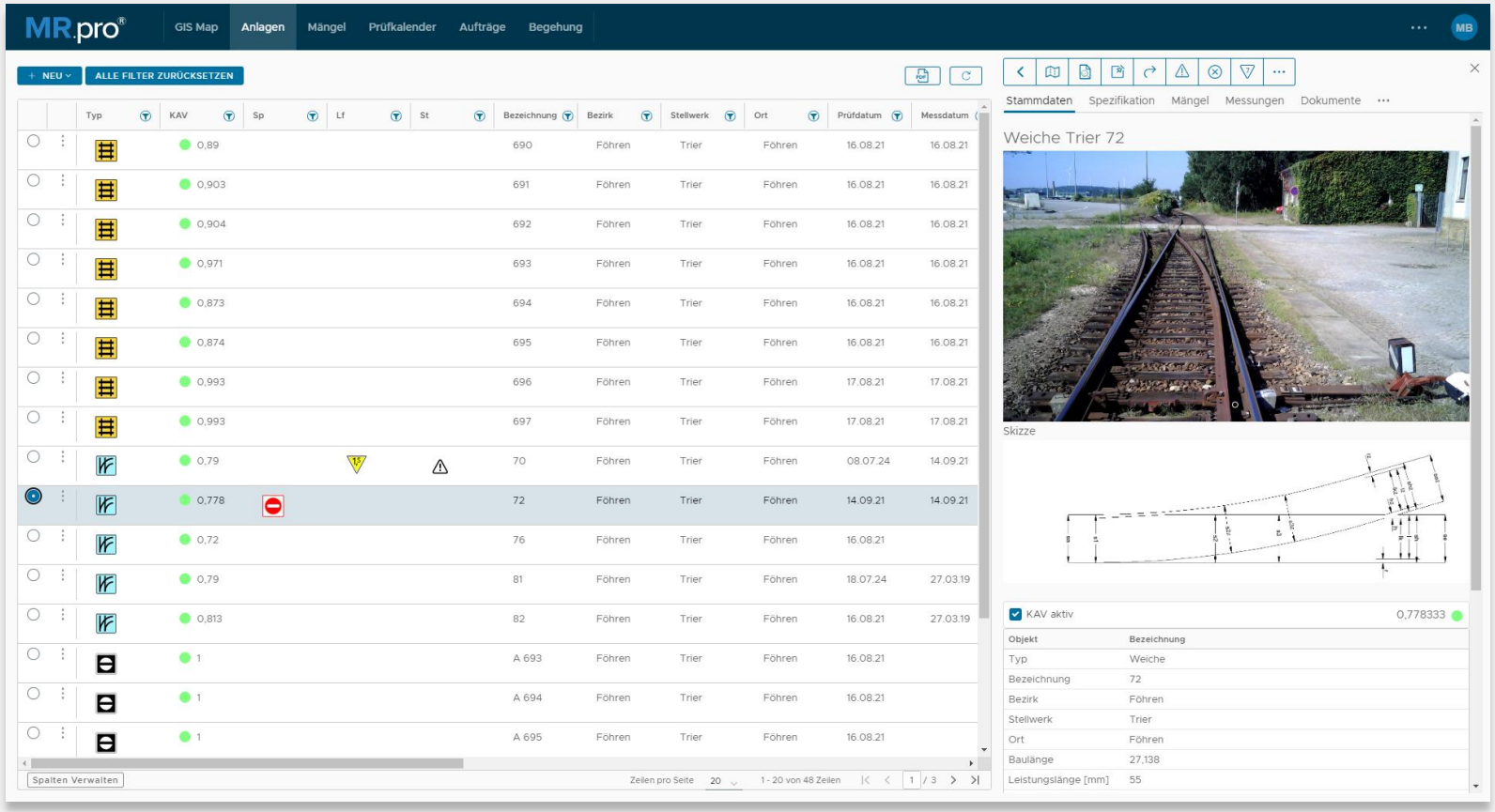
The GIS Map - getting started with the Software

The GIS Map Viewer is used to quickly identify objects and is also the control center for the entire maintenance cycle



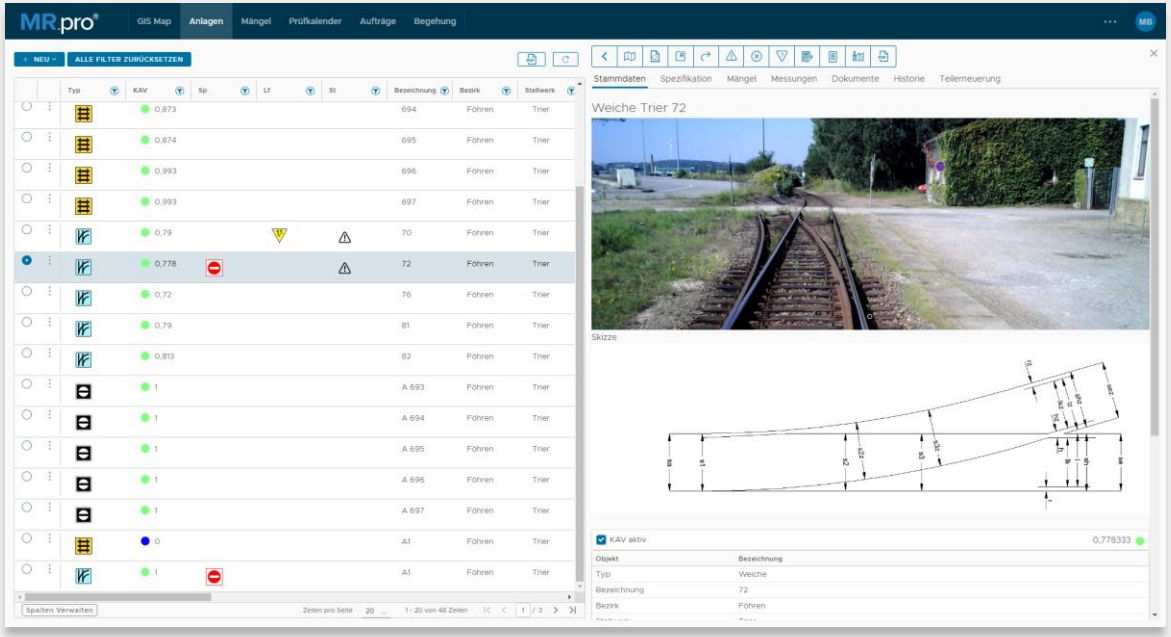
...or via the System Overview

All objects can be searched for and called up in the project explorer. Even complex and extensive systems can be easily managed.

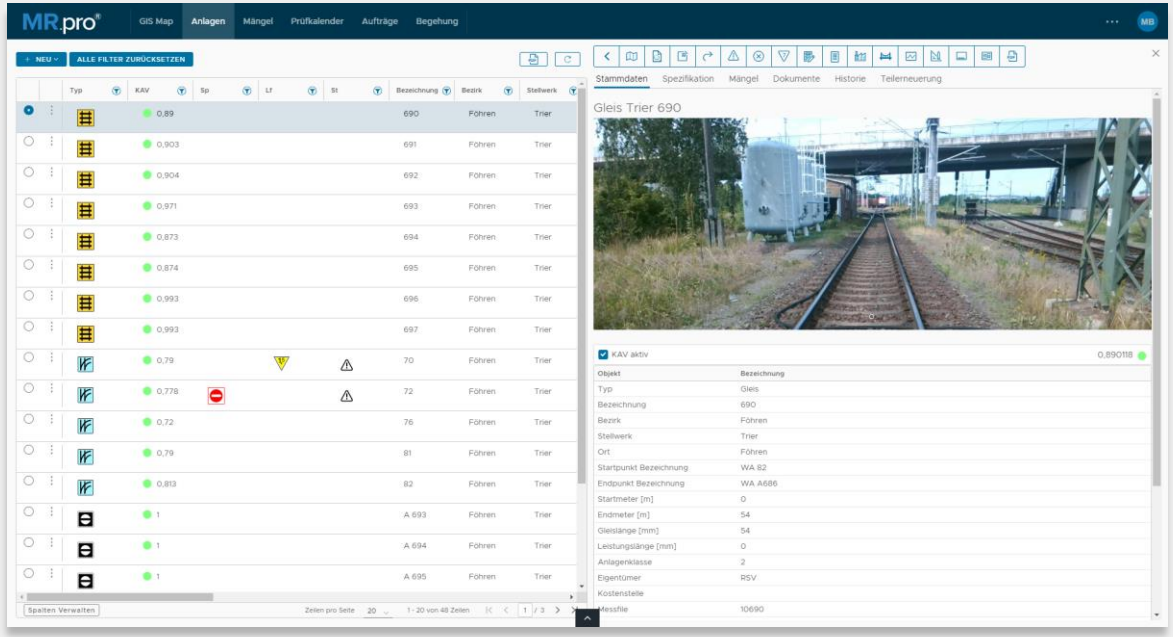


Inventorization

MR.pro® contains standardized modules for the structured recording of master data and condition data for all types of track infrastructure.



Inventory data for switches

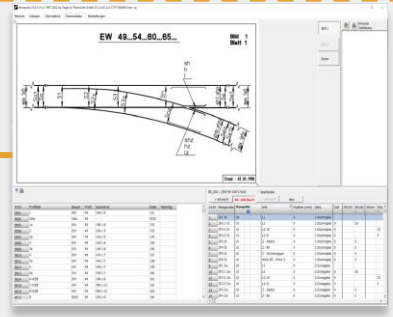


Track inventory data

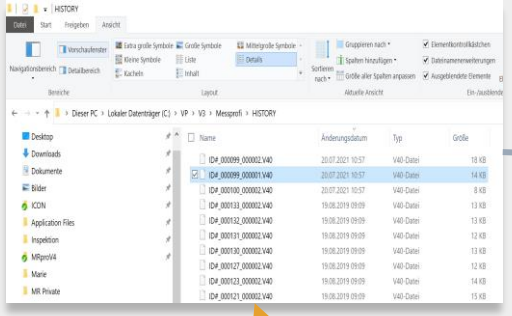
Carry out an Inspection

- Management of all master and condition data in a database
- Acceleration of the inspection process through personalized, objectified direct input on site using a touchscreen outdoor notebook in automated input masks with type-dependent defect and repair catalogues
- Guaranteed completeness of the inspection through dialog guidance and defined mandatory fields
- Secured documentation of the operational and functional capability of the system, updatable and usable as a life file including deadline monitoring
- Interface to database-based information systems based on VDV Guideline 456

MessReg® - MR.pro®



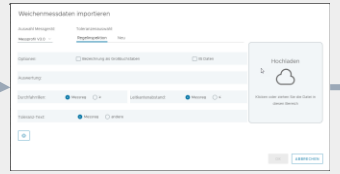
Prepare master data and measurement orders in the software



Load measurement files from the measuring device back onto the computer and save them in the history

transmitted to the measuring device

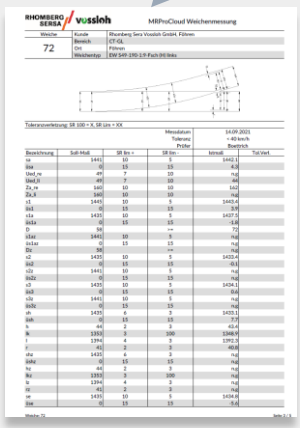
Measure switches



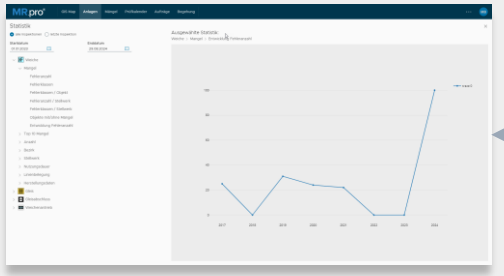
MR.pro takes the measurement files from the history

MR.pro®

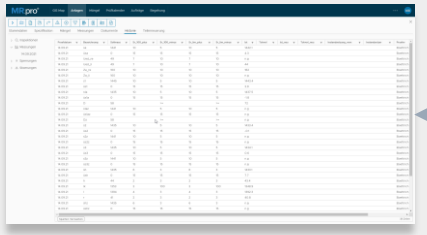
Save to database



Generate measurement data and add it to the life file

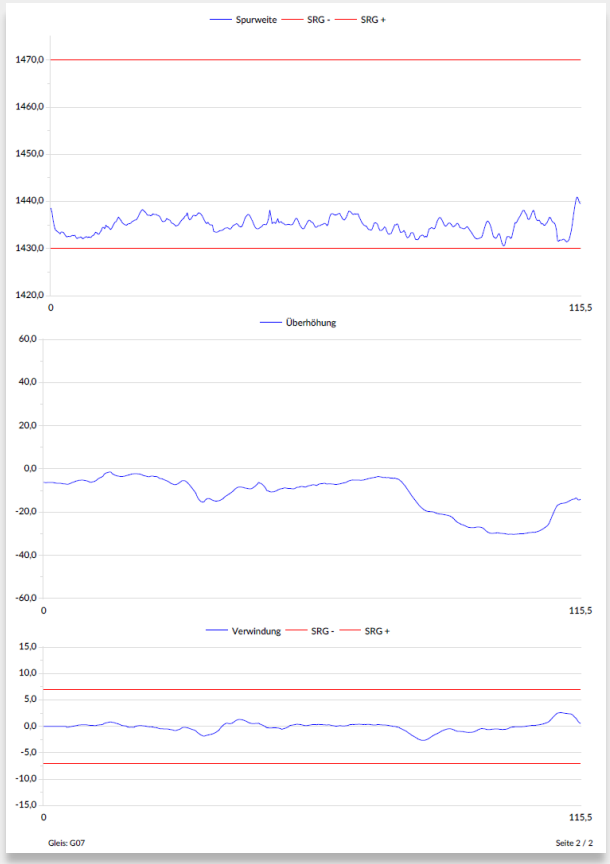


Statistics

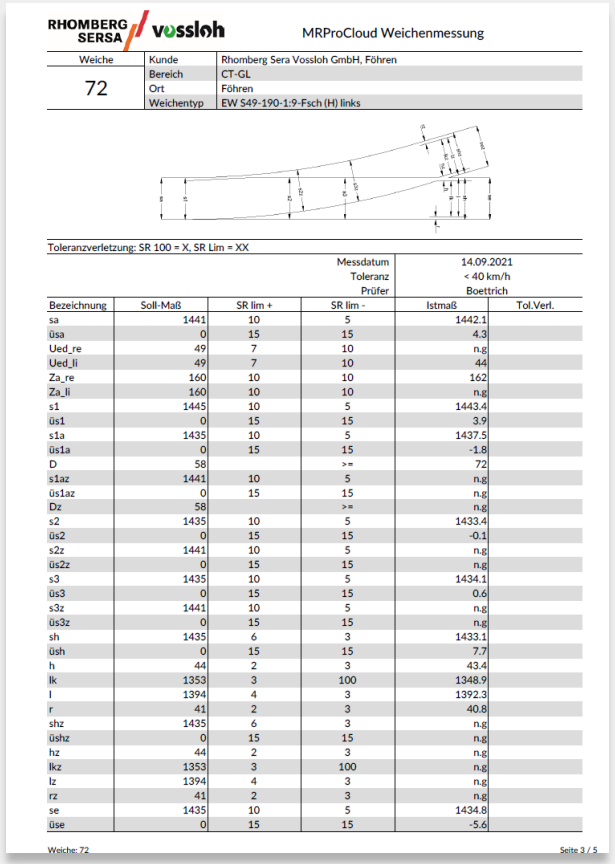


Evaluations

Measurements



Track measurement



RHOMBERG SERSA vossloh MRProCloud Weichenmessung

Weiche	Kunde	Rhomberg Sera Vossloh GmbH, Föhren
72	Bereich	CT-GL
	Ort	Föhren
	Weichentyp	EW S49-190-1:9-Fsch (H) links

Toleranzverletzung: SR 100 = X, SR Lim = XX

			Messdatum	14.09.2021	
			Toleranz	< 40 km/h	
			Prüfer	Boettrich	
Bezeichnung	Soll-Maß	SR lim +	SR lim -	Istmaß	Tol.Verl.
sa	1441	10	5	1442.1	
üsa	0	15	15	4.3	
Ued_re	49	7	10	n.g	
Ued_li	49	7	10	44	
Za_re	160	10	10	162	
Za_li	160	10	10	n.g	
s1	1445	10	5	1443.4	
üs1	0	15	15	3.9	
s1a	1435	10	5	1437.5	
üs1a	0	15	15	-1.8	
D	58		>=	72	
s1az	1441	10	5	n.g	
üs1az	0	15	15	n.g	
Dz	58		>=	n.g	
s2	1435	10	5	1433.4	
üs2	0	15	15	-0.1	
s2z	1441	10	5	n.g	
üs2z	0	15	15	n.g	
s3	1435	10	5	1434.1	
üs3	0	15	15	0.6	
s3z	1441	10	5	n.g	
üs3z	0	15	15	n.g	
sh	1435	6	3	1433.1	
üsh	0	15	15	7.7	
h	44	2	3	43.4	
lk	1353	3	100	1348.9	
l	1394	4	3	1392.3	
r	41	2	3	40.8	
shz	1435	6	3	n.g	
üshz	0	15	15	n.g	
hz	44	2	3	n.g	
lkz	1353	3	100	n.g	
lz	1394	4	3	n.g	
rz	41	2	3	n.g	
se	1435	10	5	1434.8	
üse	0	15	15	-5.6	

Weiche: 72 Seite 3 / 5

Switch measurement

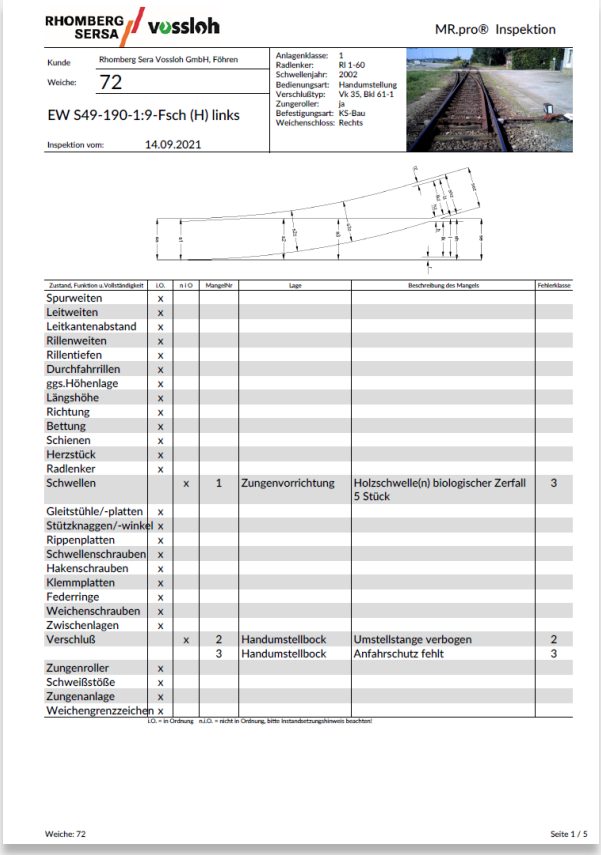
MR.pro meets all the requirements of a timely software solution for inspectors and makes more out of measurement results:

- evaluation
- summarization
- visualization
- documentation

Documentation

MR.pro provides the user with a comprehensive overview of the condition, measurement results and construction types of objects.

MR.pro switch inspection



RHOMBERG SERSA vossloh — MR.pro® Inspektion

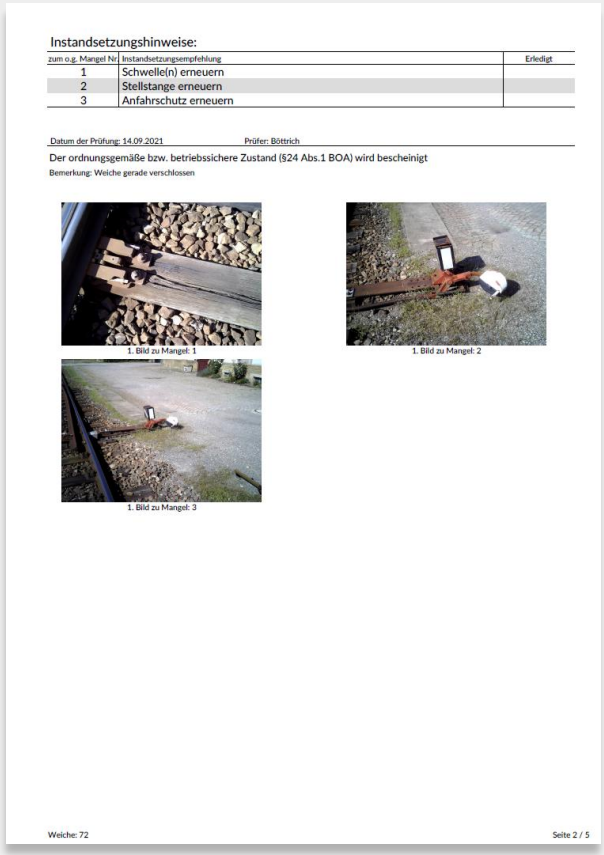
Kunde: Rhomberg Sera Vossloh GmbH, Föhren
Weiche: 72
EW S49-190-1:9-Fsch (H) links
Inspektion vom: 14.09.2021

Anlagenklasse: 1
Radlenker: RI 1-60
Schwellenjahr: 2002
Bedienungsart: Handumstellung
Verschlußtyp: Vk 35, Bkl 61-1
Zungenroller: ja
Befestigungsart: KS-Bau
Weichenschloss: Rechts

Zustand, Funktion u.Vollständigkeit	i.O.	n.i.O.	Mangelnr.	Lage	Beschreibung des Mangels	Fehlerklasse
Spurweiten	x					
Leitweiten	x					
Leitkantenabstand	x					
Rillenweiten	x					
Rillentiefen	x					
Durchfahrrillen	x					
ggs.Höhenlage	x					
Längshöhe	x					
Richtung	x					
Bettung	x					
Schienen	x					
Herzstück	x					
Radlenker	x					
Schwellen		x	1	Zungenvorrichtung	Holzschwelle(n) biologischer Zerfall 5 Stück	3
Gleitstühle/-platten	x					
Stützknaggen/-winkel	x					
Rippenplatten	x					
Schwellenschrauben	x					
Hakenschrauben	x					
Klemmplatten	x					
Federringe	x					
Weichenschrauben	x					
Zwischenlagen	x					
Verschluß		x	2	Handumstellbock	Umstellstange verbogen	2
			3	Handumstellbock	Anfahrschutz fehlt	3
Zungenroller	x					
Schweißstöße	x					
Zungenanlage	x					
Weichengrenzzeichen	x					

i.O. = in Ordnung n.i.O. = nicht in Ordnung, bitte Instandsetzungshinweis beachten!

Weiche: 72 Seite 1 / 5



Instandsetzungshinweise:

zum o.g. Mangel Nr.	Instandsetzungsempfehlung	Erledigt
1	Schwelle(n) erneuern	
2	Stellstange erneuern	
3	Anfahrschutz erneuern	

Datum der Prüfung: 14.09.2021 Prüfer: Böttrich

Der ordnungsgemäße bzw. betriebssichere Zustand (§24 Abs.1 BOA) wird bescheinigt

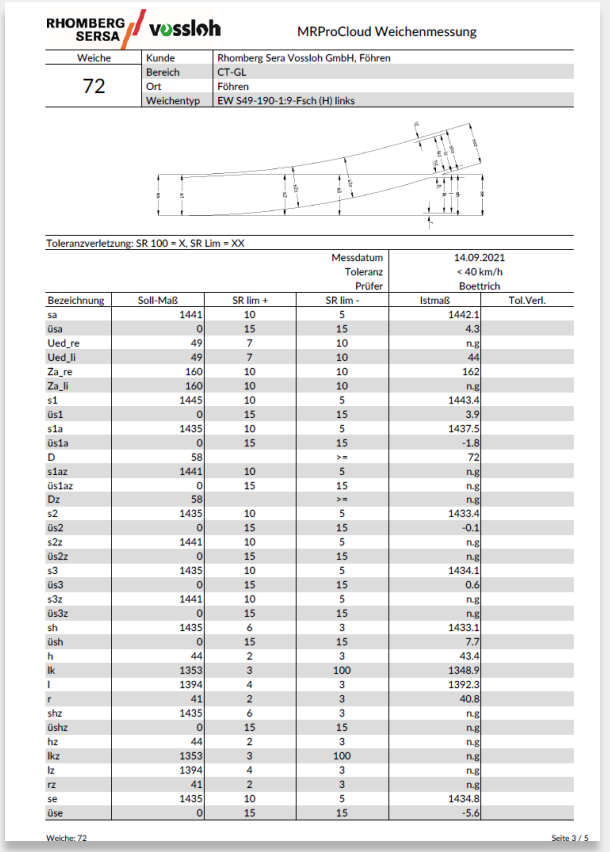
Bemerkung: Weiche gerade verschlossen

1. Bild zu Mangel: 1

1. Bild zu Mangel: 2

1. Bild zu Mangel: 3

Weiche: 72 Seite 2 / 5



RHOMBERG SERSA vossloh — MRProCloud Weichenmessung

Weiche	Kunde	Rhomberg Sera Vossloh GmbH, Föhren
72	Bereich	CT-GL
	Ort	Föhren
	Weichentyp	EW S49-190-1:9-Fsch (H) links

Toleranzverletzung: SR 100 = X, SR Lim = XX

			Messdatum	14.09.2021
			Toleranz	< 40 km/h
			Prüfer	Boettrich

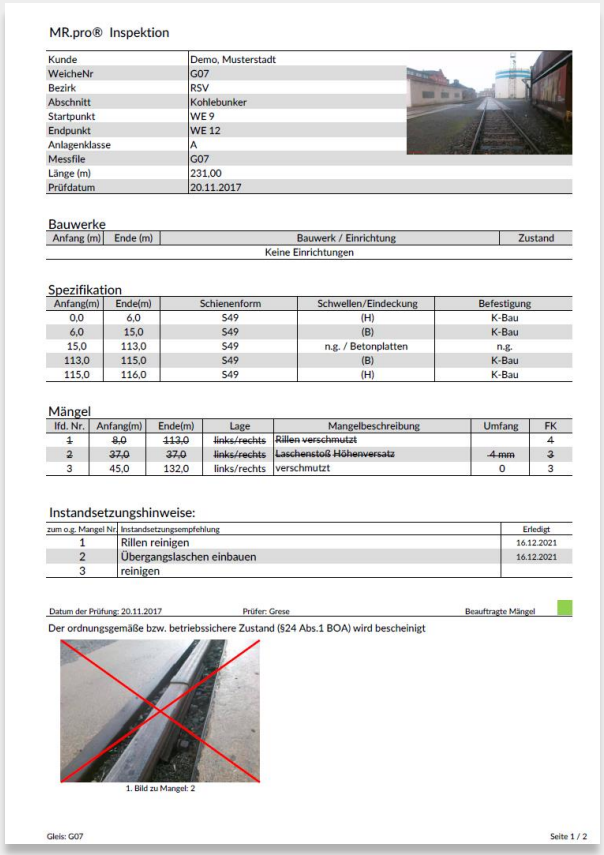
Bezeichnung	Soll-Maß	SR lim +	SR lim -	Istmaß	Tol.Verl.
sa	1441	10	5	1442.1	
üsa	0	15	15	4.3	
Ued_re	49	7	10	n.g.	
Ued_li	49	7	10	44	
Za_re	160	10	10	162	
Za_li	160	10	10	n.g.	
s1	1445	10	5	1443.4	
üs1	0	15	15	3.9	
s1a	1435	10	5	1437.5	
üs1a	0	15	15	-1.8	
D	58		>=	72	
s1az	1441	10	5	n.g.	
üs1az	0	15	15	n.g.	
Dz	58		>=	n.g.	
s2	1435	10	5	1433.4	
üs2	0	15	15	-0.1	
s2z	1441	10	5	n.g.	
üs2z	0	15	15	n.g.	
s3	1435	10	5	1434.1	
üs3	0	15	15	0.6	
s3z	1441	10	5	n.g.	
üs3z	0	15	15	n.g.	
sh	1435	6	3	1433.1	
üsh	0	15	15	7.7	
h	44	2	3	43.4	
lk	1353	3	100	1348.9	
l	1394	4	3	1392.3	
r	41	2	3	40.8	
shz	1435	6	3	n.g.	
üshz	0	15	15	n.g.	
hz	44	2	3	n.g.	
lkz	1353	3	100	n.g.	
lz	1394	4	3	n.g.	
rz	41	2	3	n.g.	
se	1435	10	5	1434.8	
üse	0	15	15	-5.6	

Weiche: 72 Seite 3 / 5

Documentation

MR.pro provides the user with a comprehensive overview of the condition, measurement results and construction types of objects.

MR.pro track inspection



MR.pro® Inspektion

Kunde	Demo, Musterstadt
WeicheNr	G07
Bezirk	RSV
Abschnitt	Kohlebunker
Startpunkt	WE 9
Endpunkt	WE 12
Anlagenklasse	A
Messfile	G07
Länge (m)	231.00
Prüfdatum	20.11.2017

Bauwerke

Anfang (m)	Ende (m)	Bauwerk / Einrichtung	Zustand
Keine Einrichtungen			

Spezifikation

Anfang(m)	Ende(m)	Schienenform	Schwellen/Eindeckung	Befestigung
0,0	6,0	S49	(H)	K-Bau
6,0	15,0	S49	(B)	K-Bau
15,0	113,0	S49	n.g. / Betonplatten	n.g.
113,0	115,0	S49	(B)	K-Bau
115,0	116,0	S49	(H)	K-Bau

Mängel

lfd. Nr.	Anfang(m)	Ende(m)	Lage	Mangelbeschreibung	Umfang	FK
~~1~~	~~8.0~~	~~113.0~~	~~links/rechts~~	~~Rillen verschmutzt~~		~~4~~
~~2~~	~~37.0~~	~~37.0~~	~~links/rechts~~	~~Laschenstoß Höhenversatz~~	~~4 mm~~	~~3~~
3	45,0	132,0	links/rechts	verschmutzt	0	3

Instandsetzungshinweise:

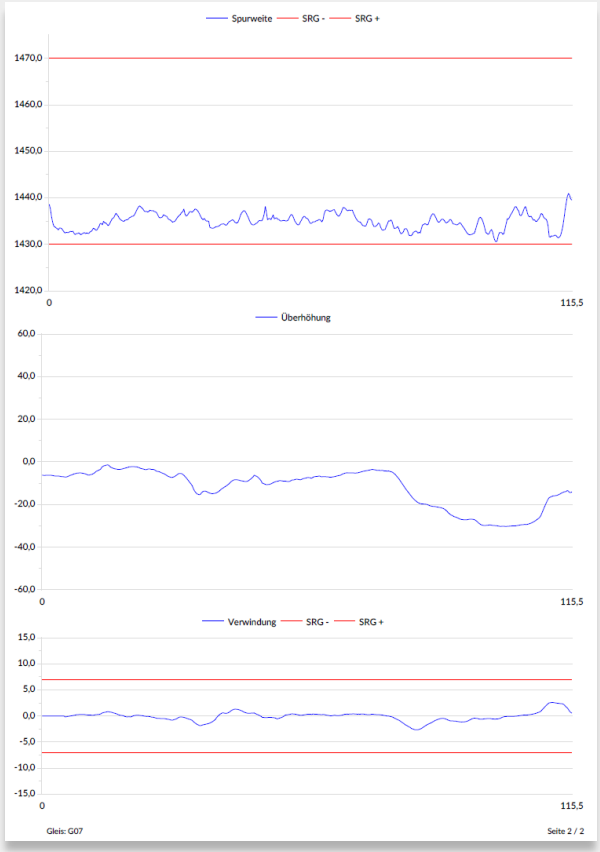
zum o.g. Mangel Nr.	Instandsetzungsempfehlung	Erledigt
1	Rillen reinigen	16.12.2021
2	Übergangslaschen einbauen	16.12.2021
3	reinigen	

Datum der Prüfung: 20.11.2017 Prüfer: Grese Beauftragte Mängel

Der ordnungsgemäße bzw. betriebssichere Zustand (§24 Abs.1 BOA) wird bescheinigt

1. Bild zu Mangel: 2

Gleis: G07 Seite 1 / 2



Preconfigured Object Types

- Switch*
- Track*
- Track buffer stop*
- Level crossings (infrastructure)
- Platform
- Bridge
- Culvert
- Connection (railroad)
- ALKIS property management (parcels of land, buildings)

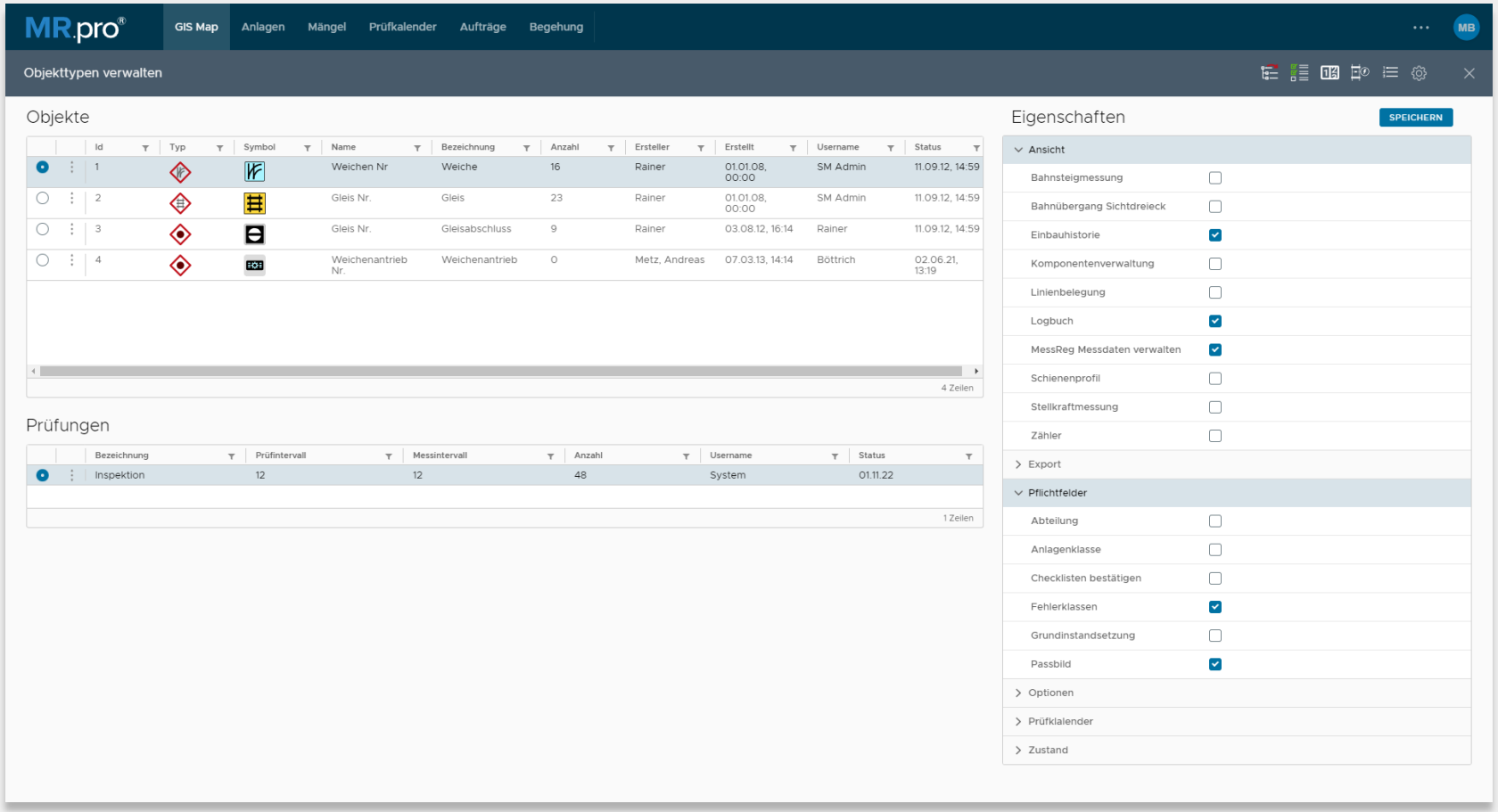
- Point machine / setting device
- Track barriers
- signalling
- Track switching devices / wheel sensors
- Catenary / masts

- Further objects on customer request

* Standard database contents

Object Types

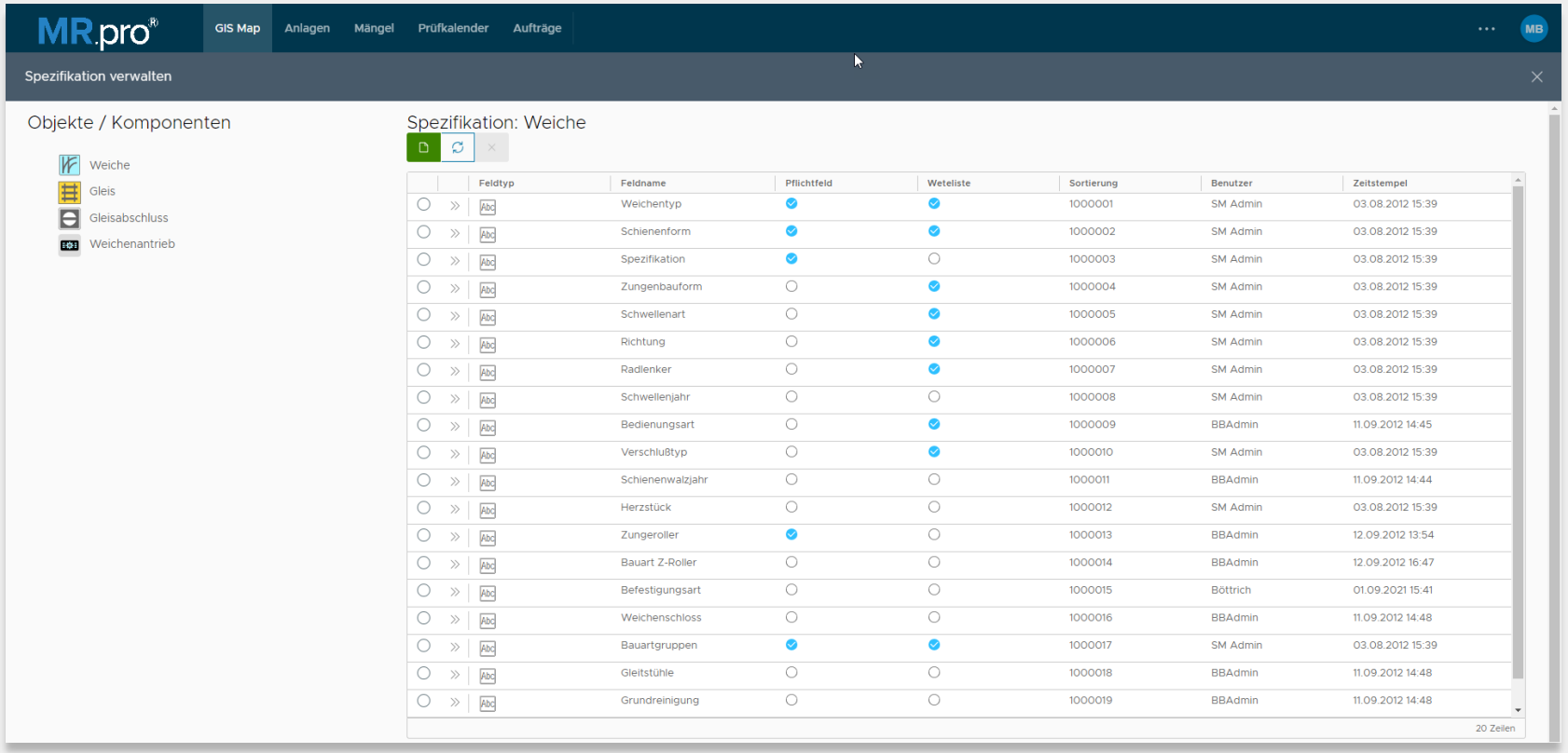
In addition to line objects such as tracks, point objects can also be managed in MR.pro®: Switches, crossings, track buffers, level crossings, masts, signalling, structures, buildings, etc.



can be typified with object type symbols

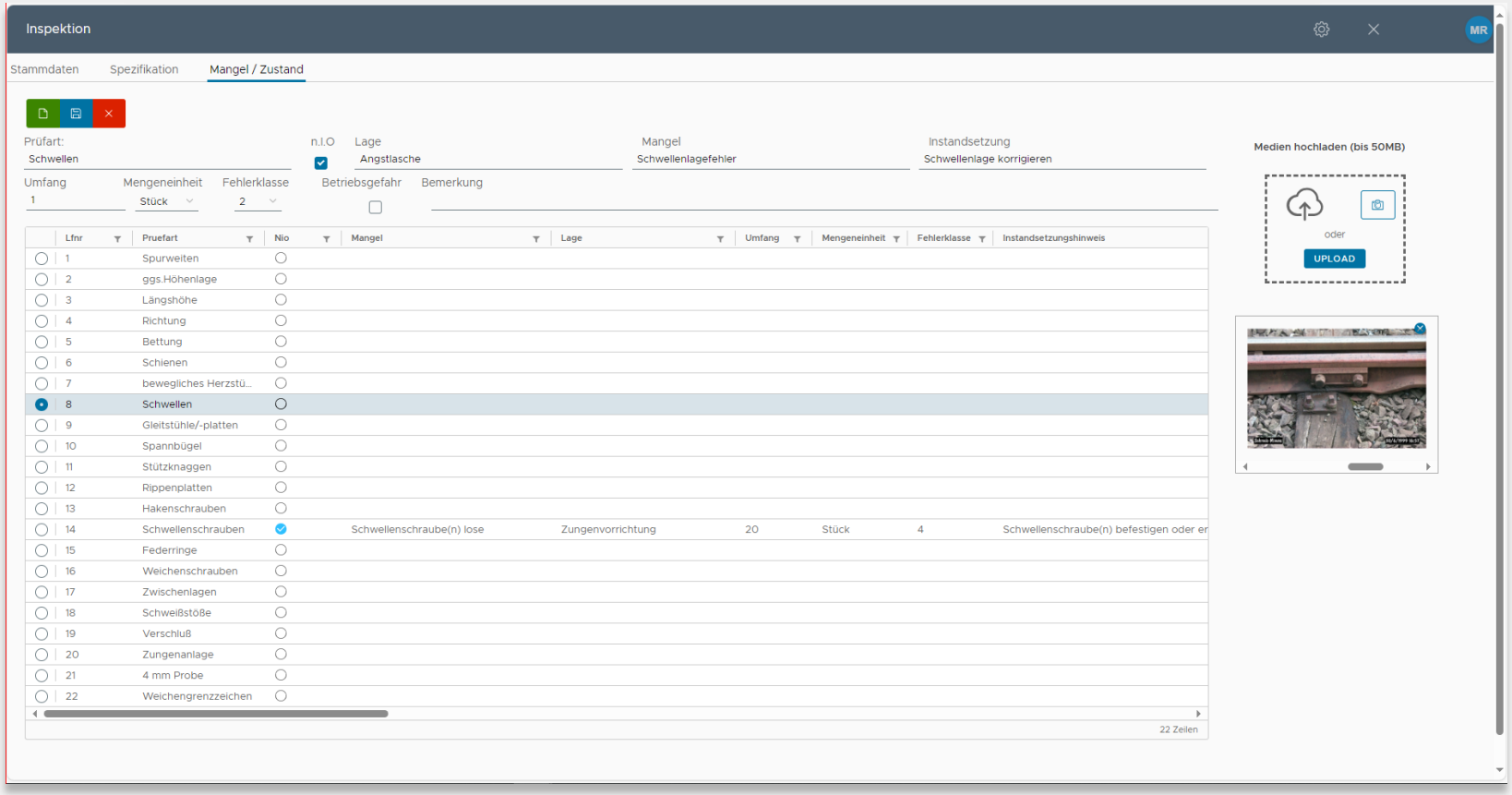
Types & Components

Individual designs and component contents can be freely configured for all object types.



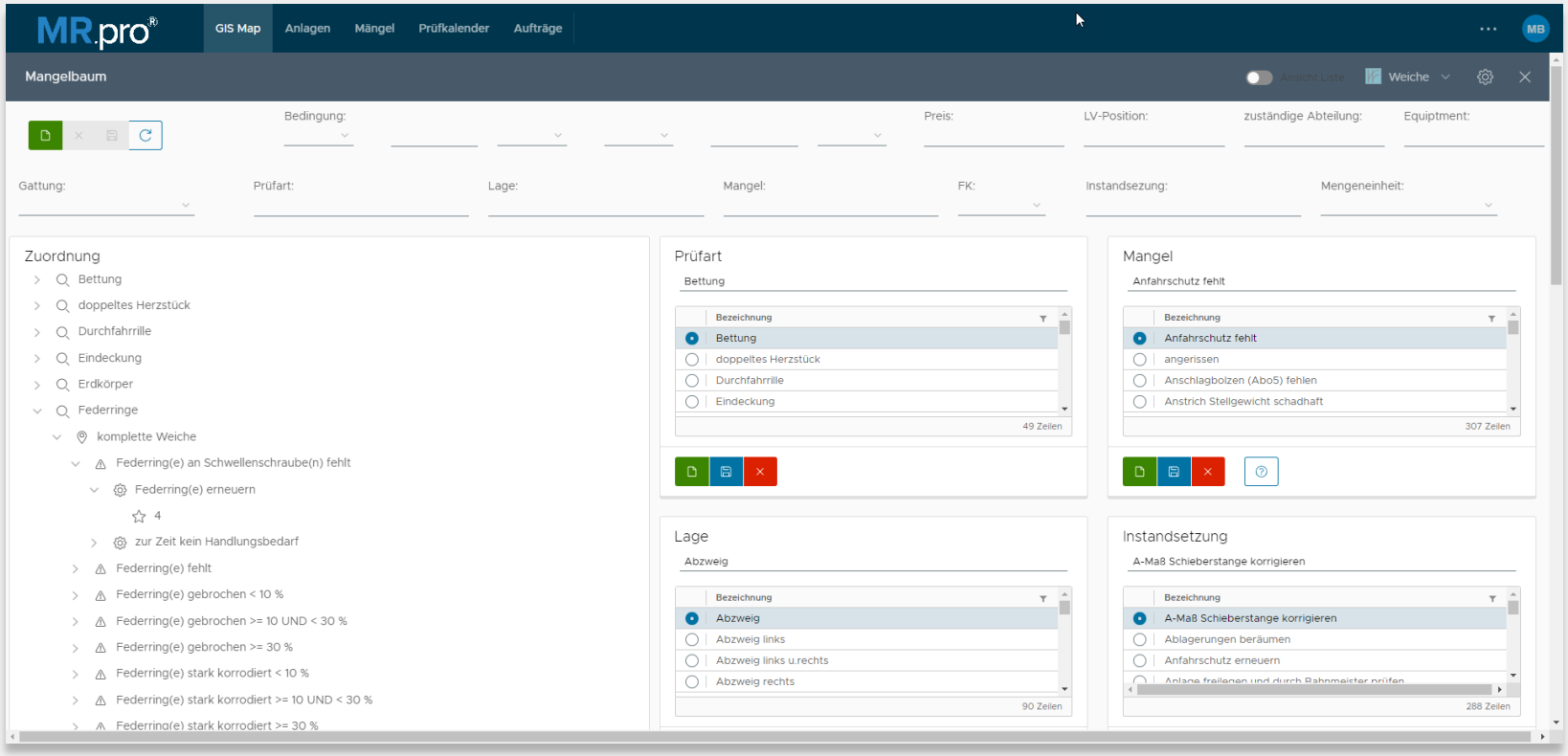
Condition Assessment and Classification

Condition recording with MR.pro is ergonomically designed to minimize the time required. Sophisticated dialog guidance ensures that nothing is overlooked, while the plausibility check prevents any operating errors.



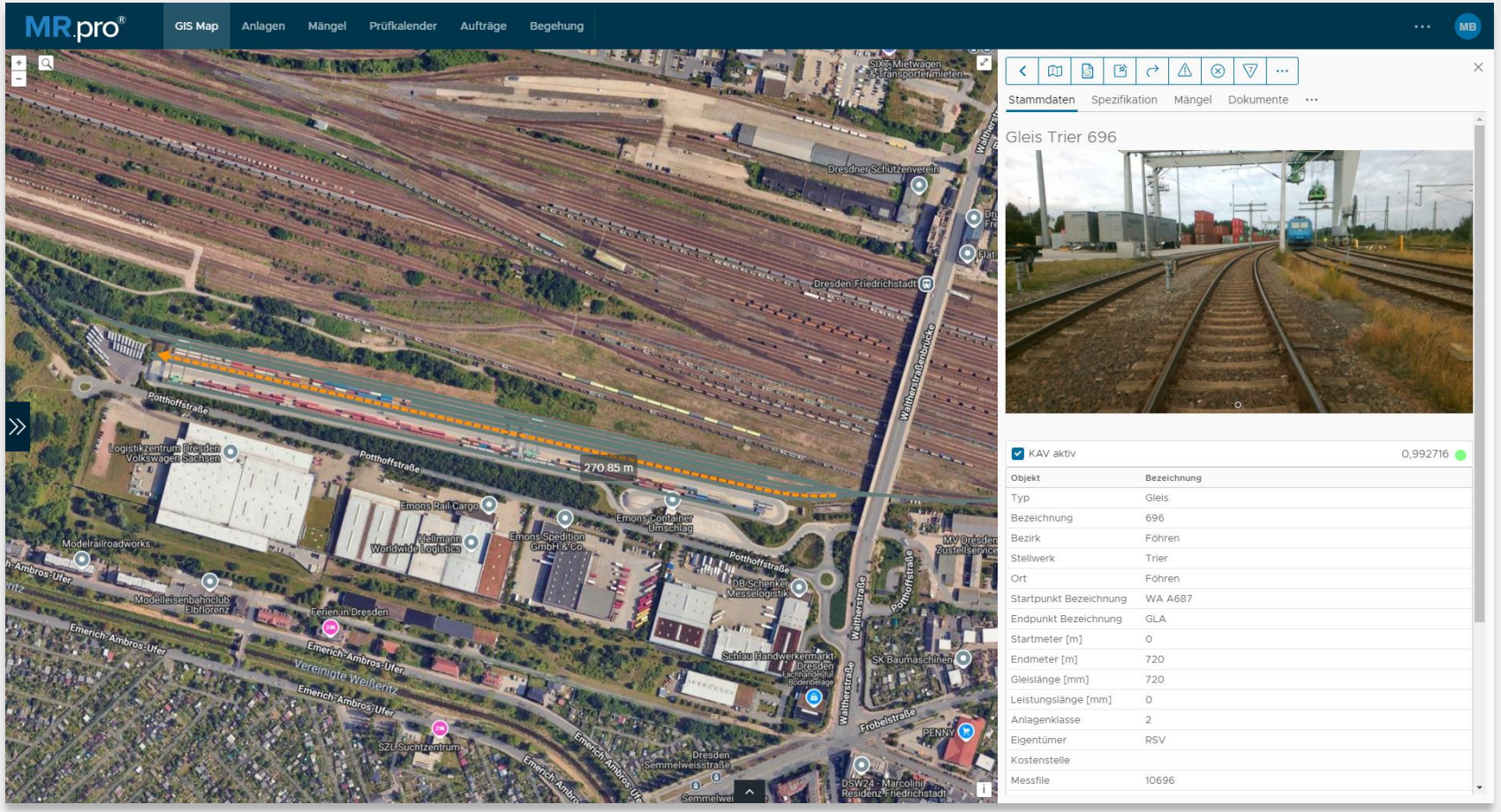
Assessment

The assessment and classification of identified defects has already been carried out in advance in consultation with the customer and is linked 1:1 with the MR.pro® defect code. The inspector automatically adopts the defect class when recording the defects.



The Visualization - the GIS Map Viewer

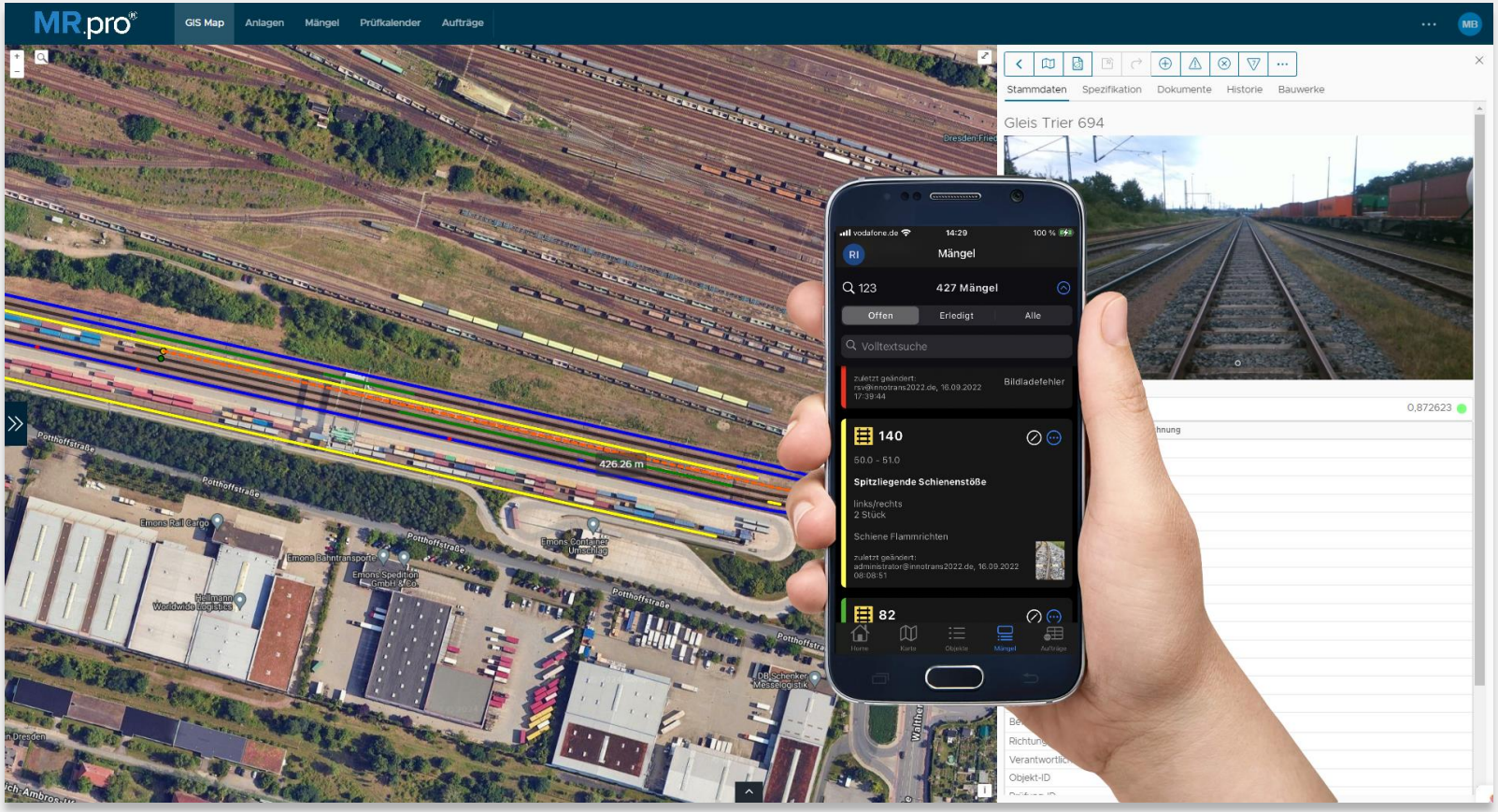
A mouse click takes the user directly from the graphic to the status and inventory data as well as to the generation of orders or feedback on completed repairs.



MR.pro as Mobile App

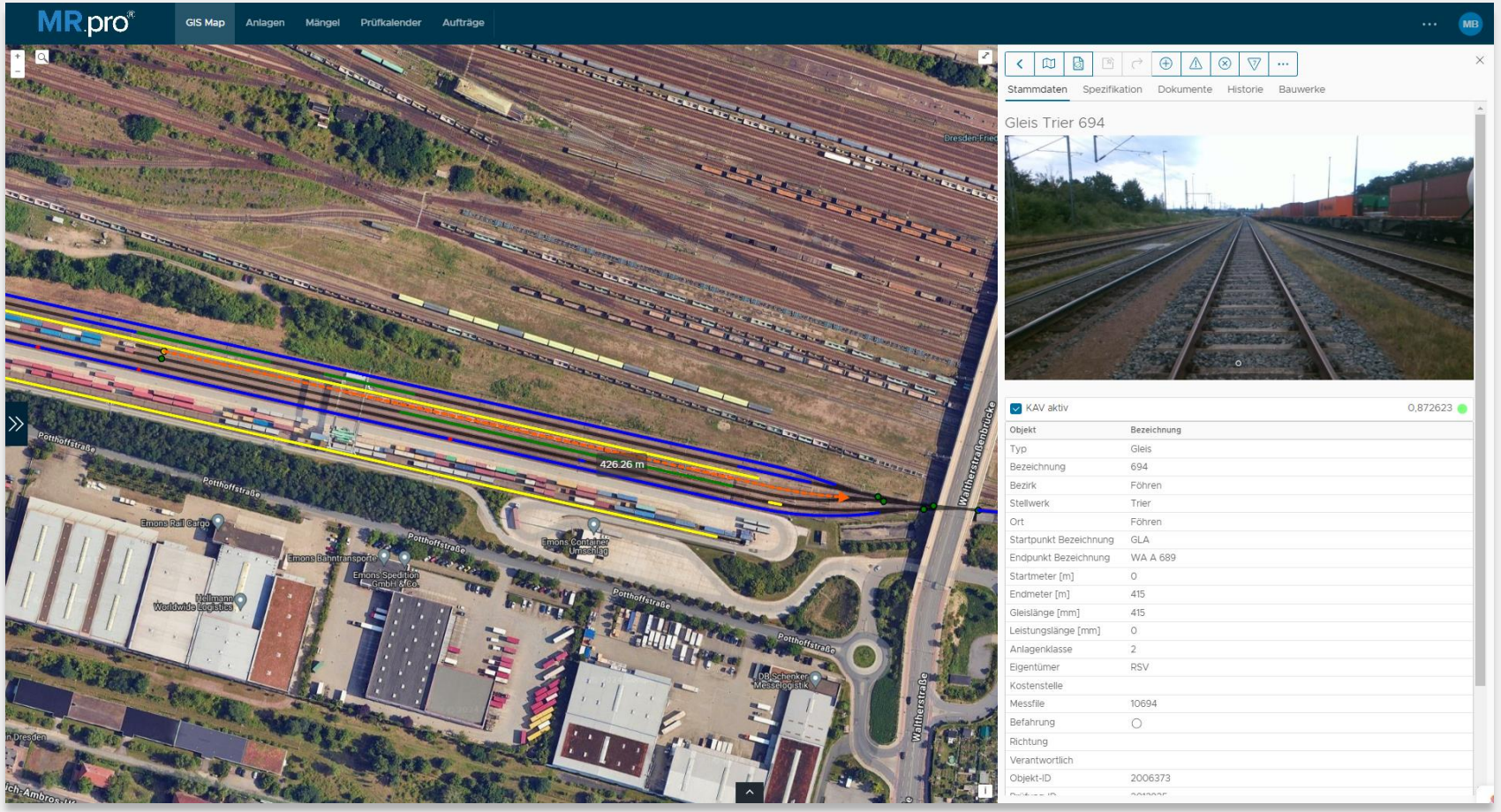
Defects can be recorded at any time by authorized persons on mobile devices and made available to all users as centrally stored information.

Feedback on measures carried out using mobile devices facilitates end-to-end digital documentation and can be made comprehensible and transparent with before/after photos or videos.



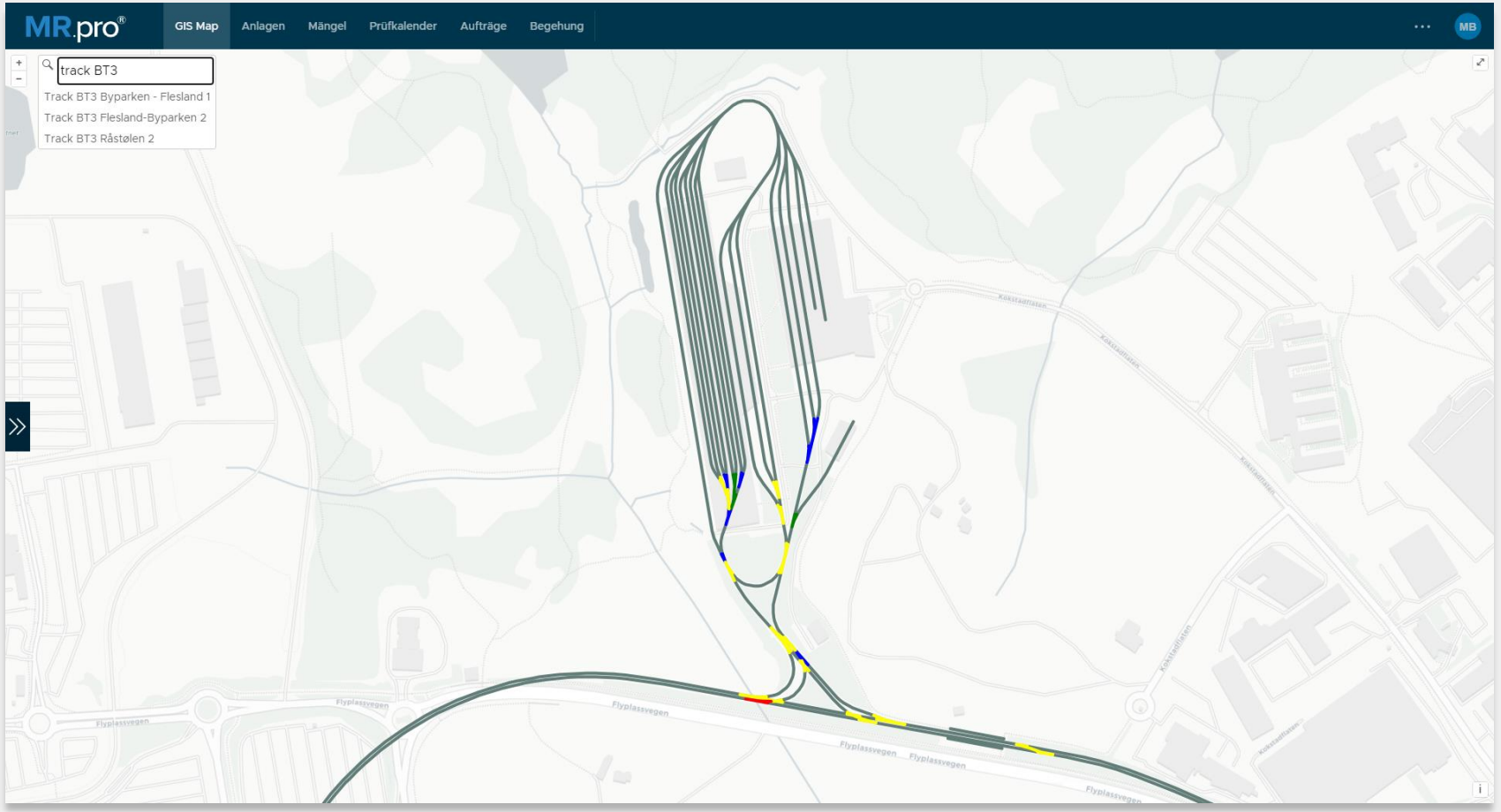
GIS Map - Viewer with Map Background

Database information can be visualized in a user-friendly way, as a colour-coded status overview with status bars, here based on freely available maps, e.g. from GoogleSatellitMap.



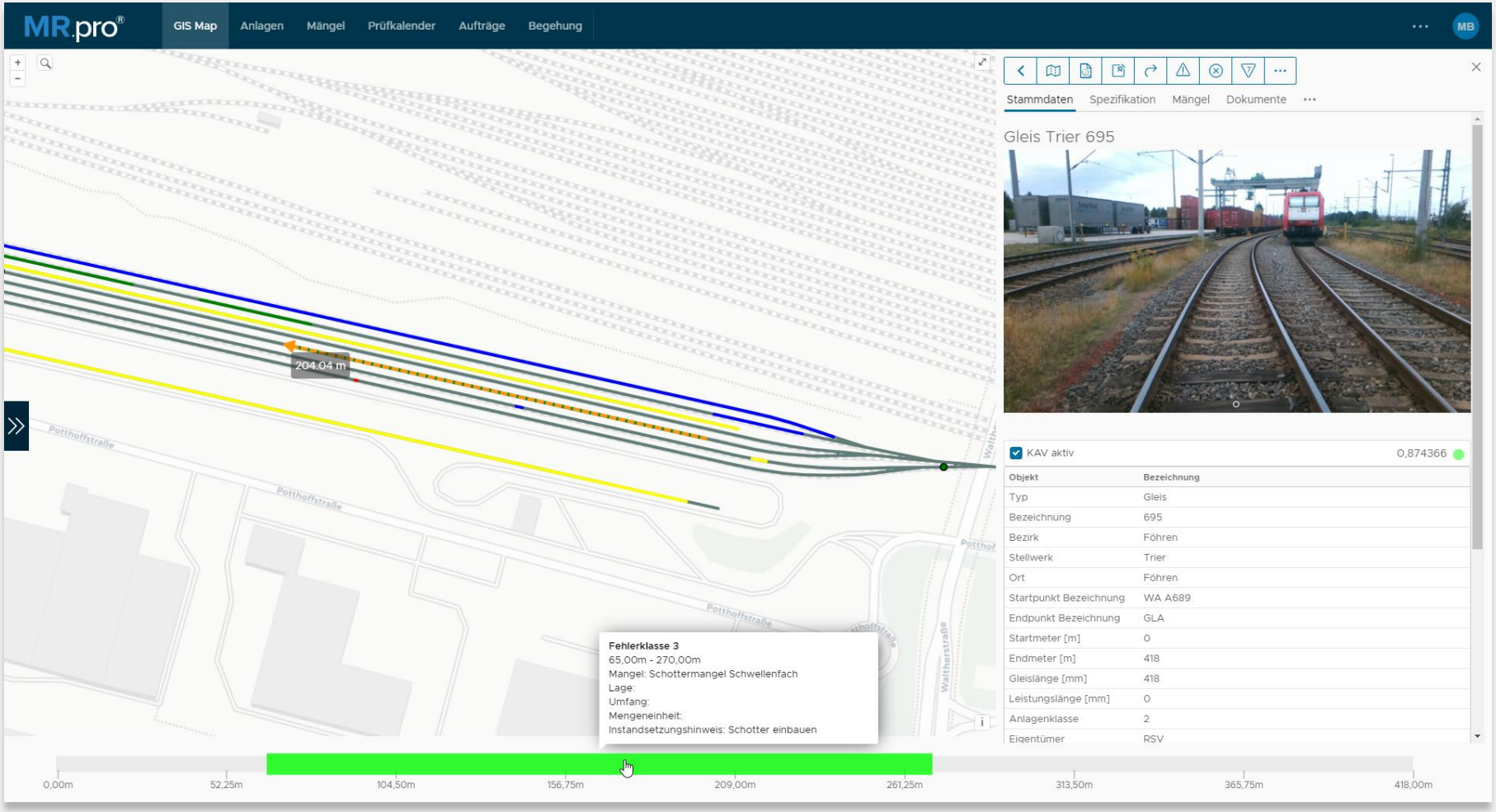
The entire Network at a Glance

The GIS Map Viewer gives you a network-wide overview. An integrated search function makes it easier to find individual objects or entire object groups.



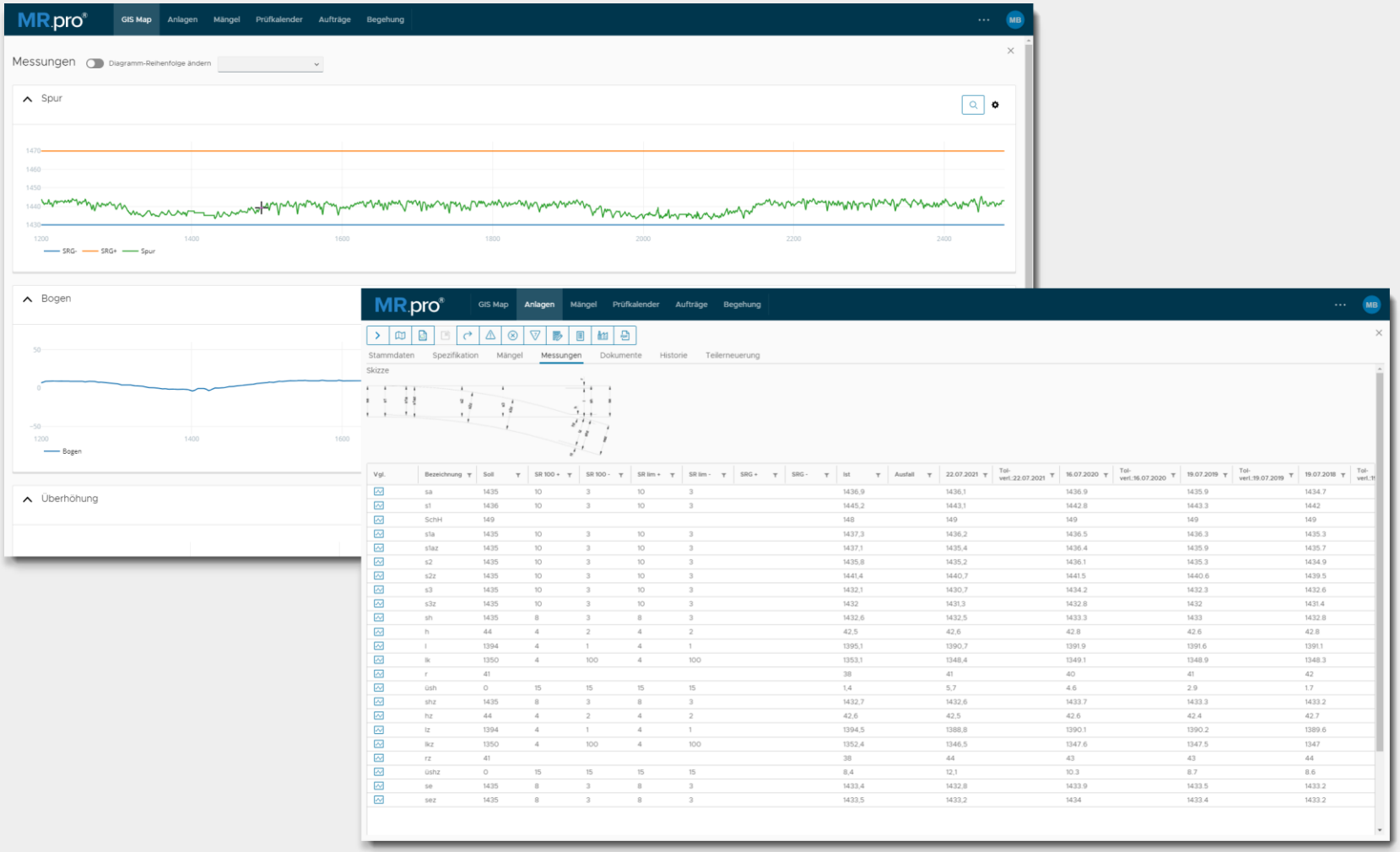
MapBox Carto light

Dynamic Segmentation - Defect Classes



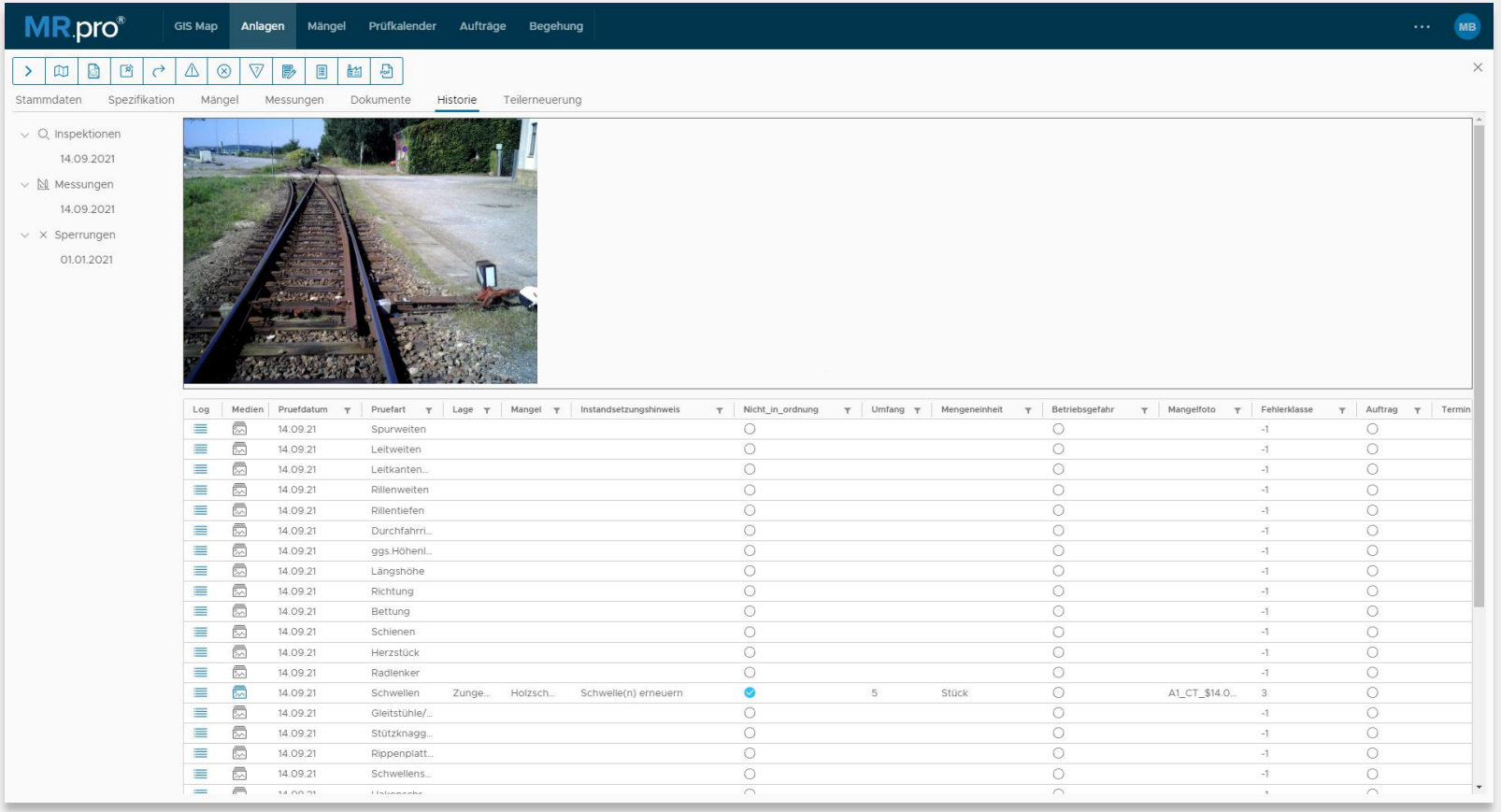
Measurement Values

- Clear display of measurement results (track & points)
- Current or historical



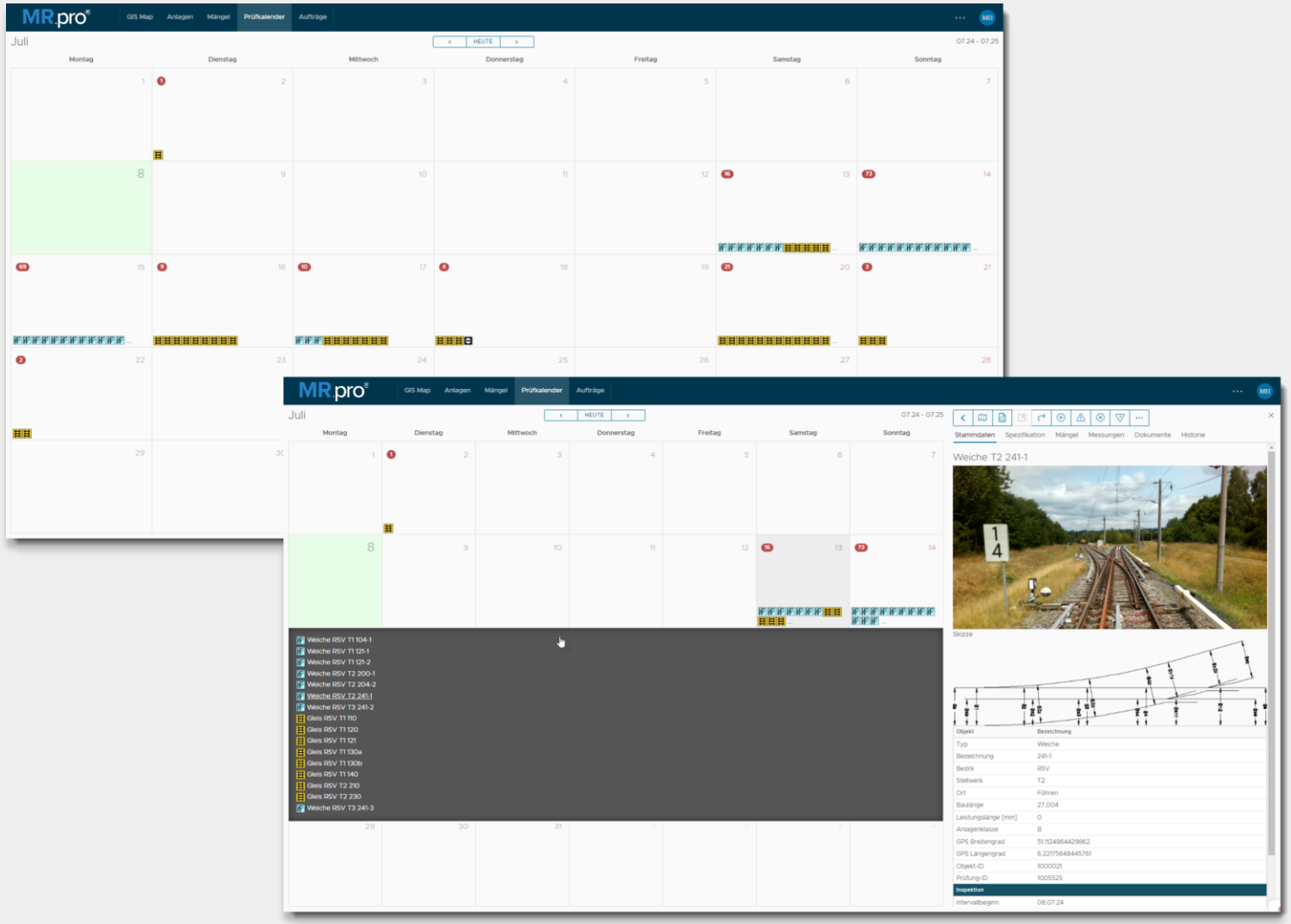
Life History

The entire history of a system at the click of a mouse. From installation to removal, all information about a system object is available.



Maintenance Management

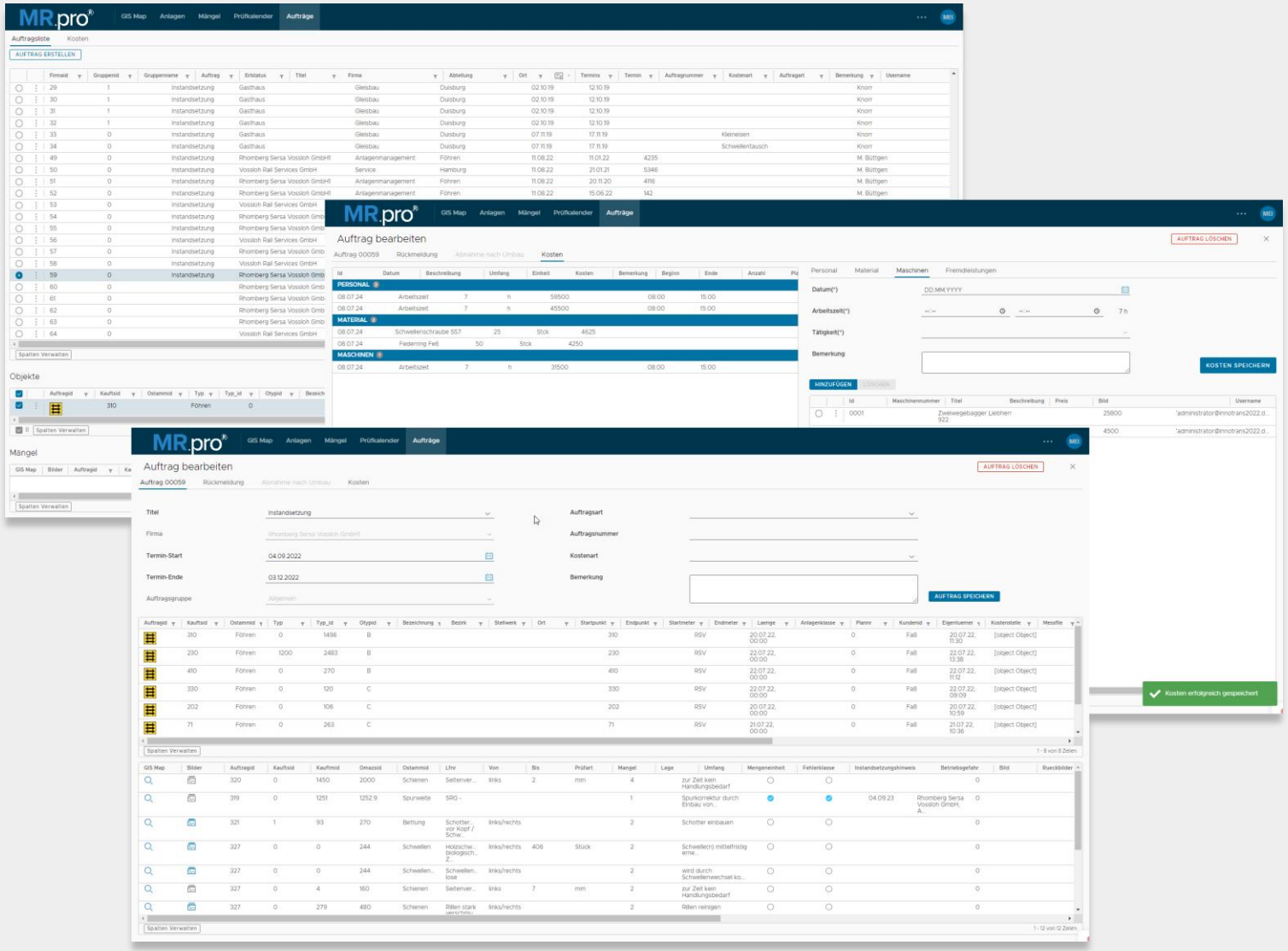
The task of maintenance management is to initiate and carry out all measures required for planned maintenance work and to monitor deadlines.



Order Planning

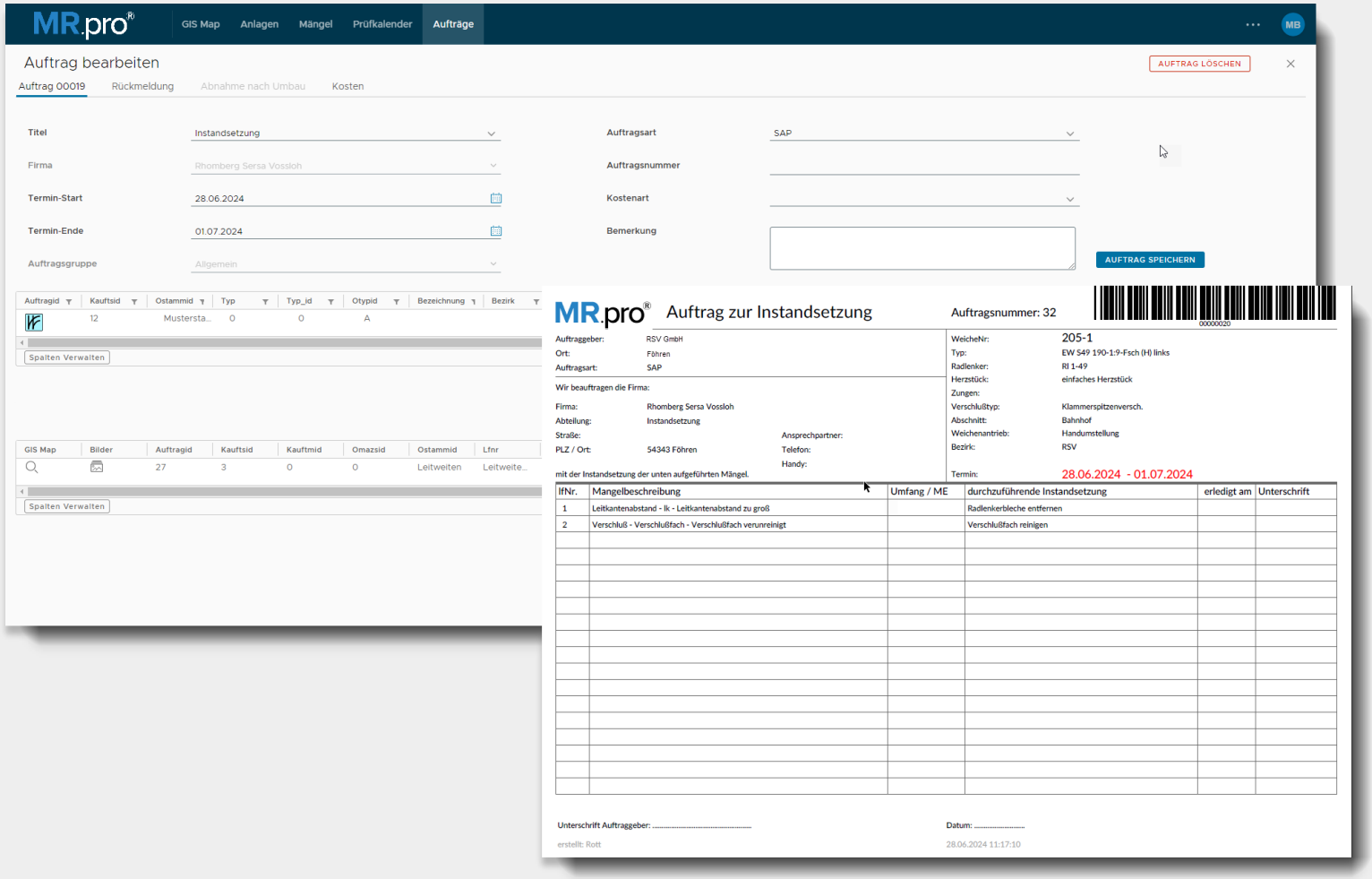
Overview of all planned maintenance activities

- Order list
- Time schedule
- Local reference
- Equipment, material & personnel cost recording



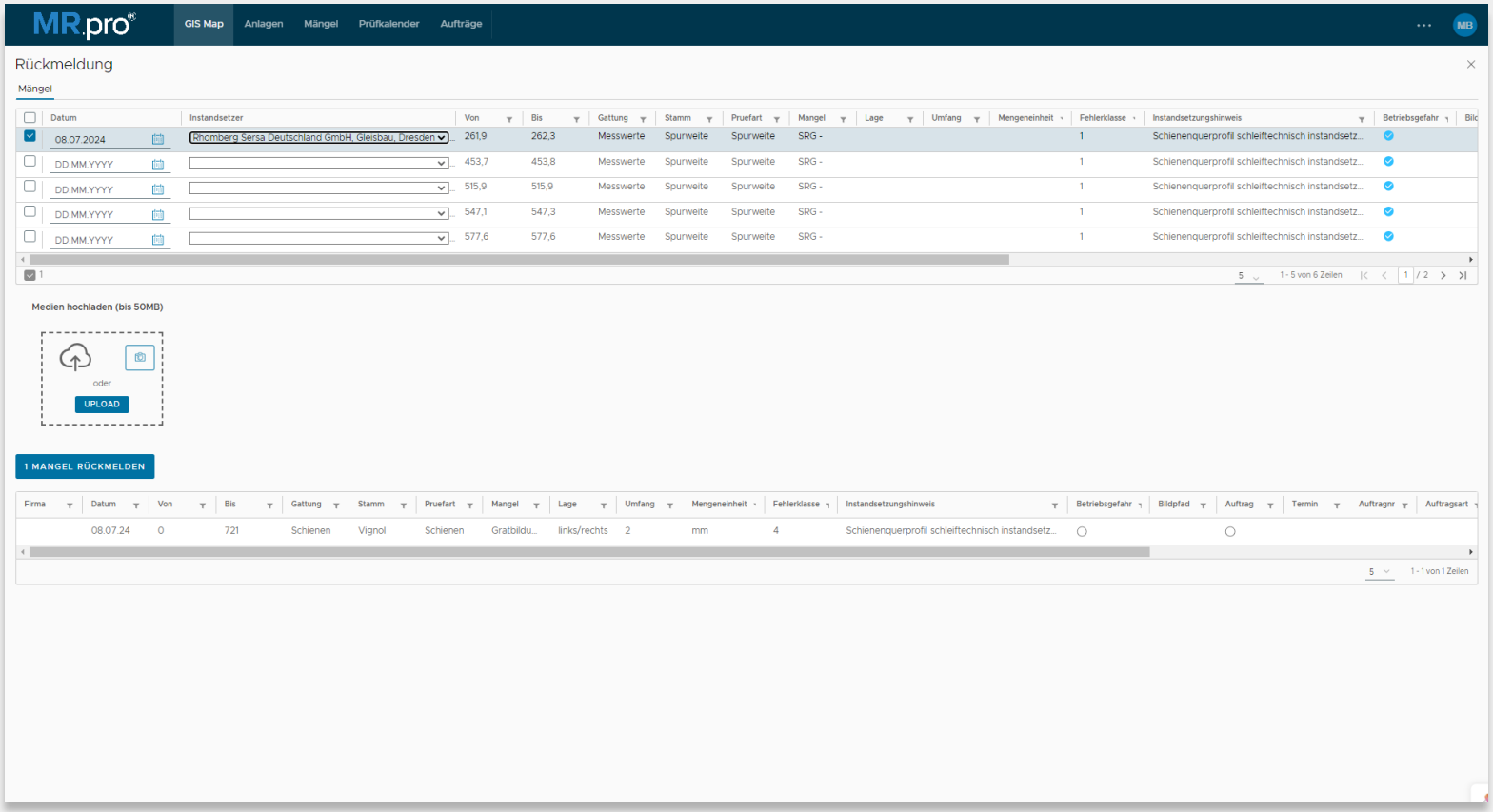
Assignment

The summarized and evaluated inspection results flow directly into the further maintenance process, planning, budgeting and implementation as maintenance requirements.

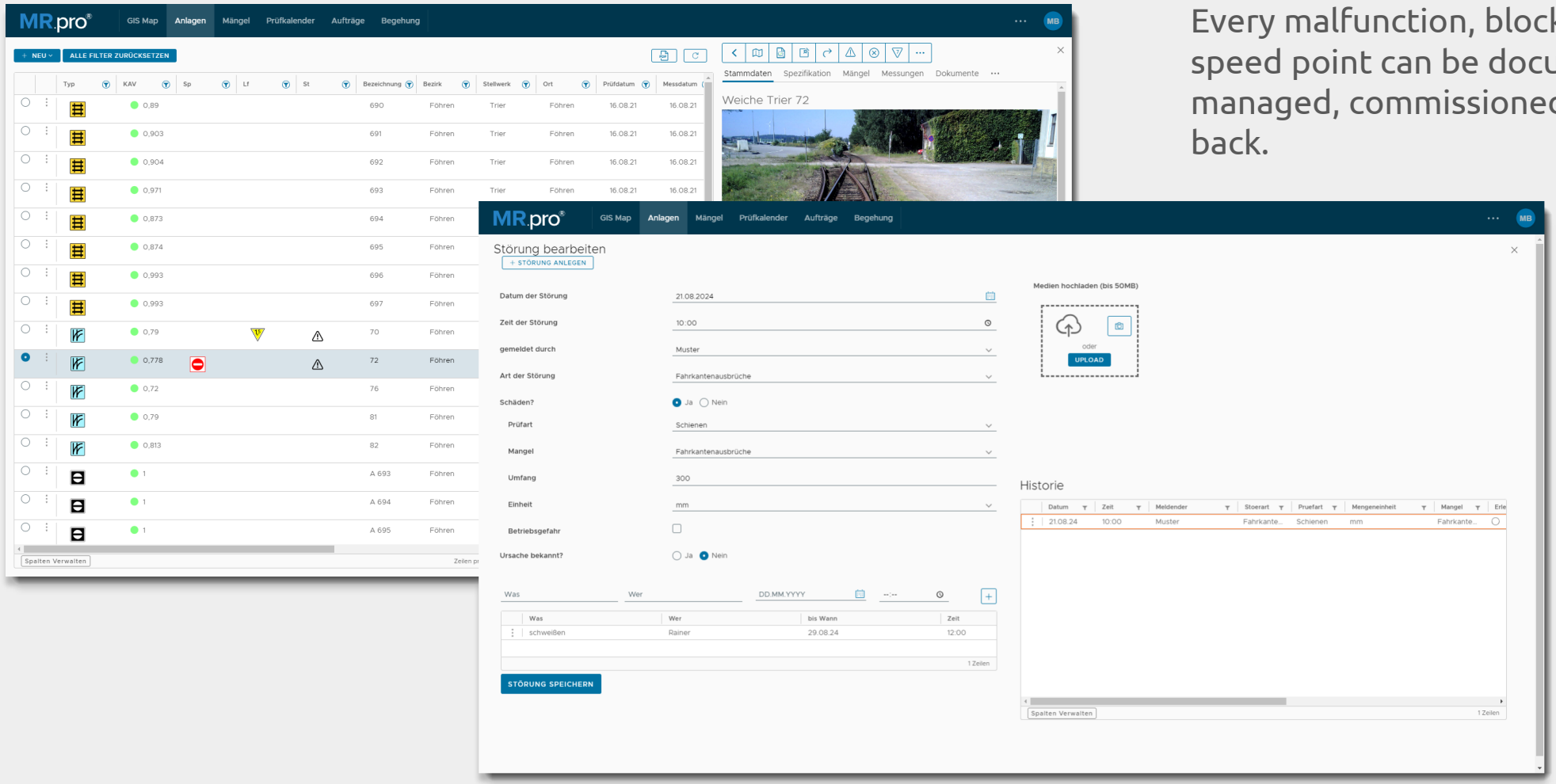


Feedback

- With MR.pro, the documentation effort for order confirmation is very low, as no time-consuming double entry is required
- Automatic updating of documentation (inventory data & status data)



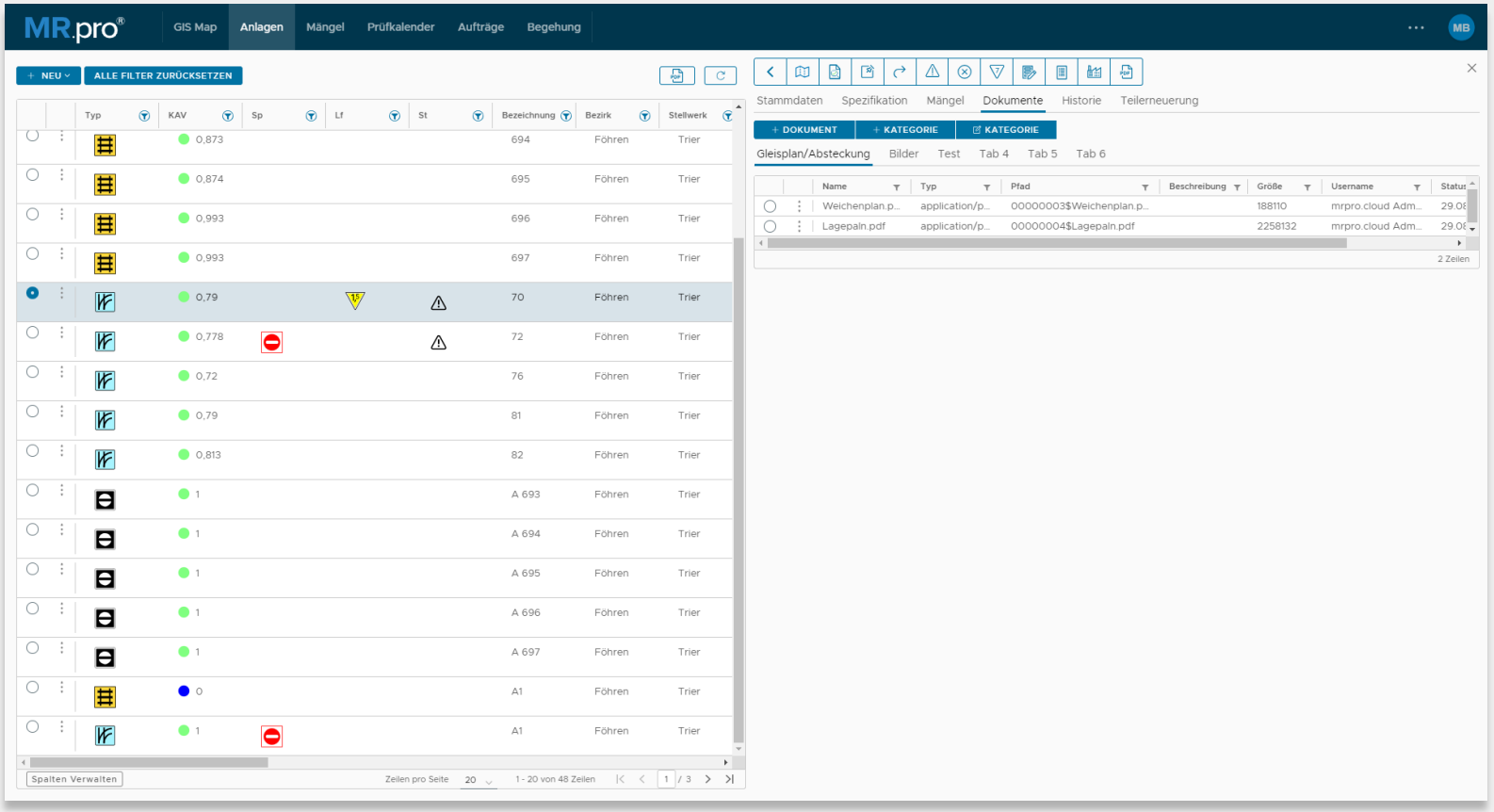
Incident Management



Every malfunction, blocking or slow speed point can be documented, managed, commissioned and reported back.

Document Management

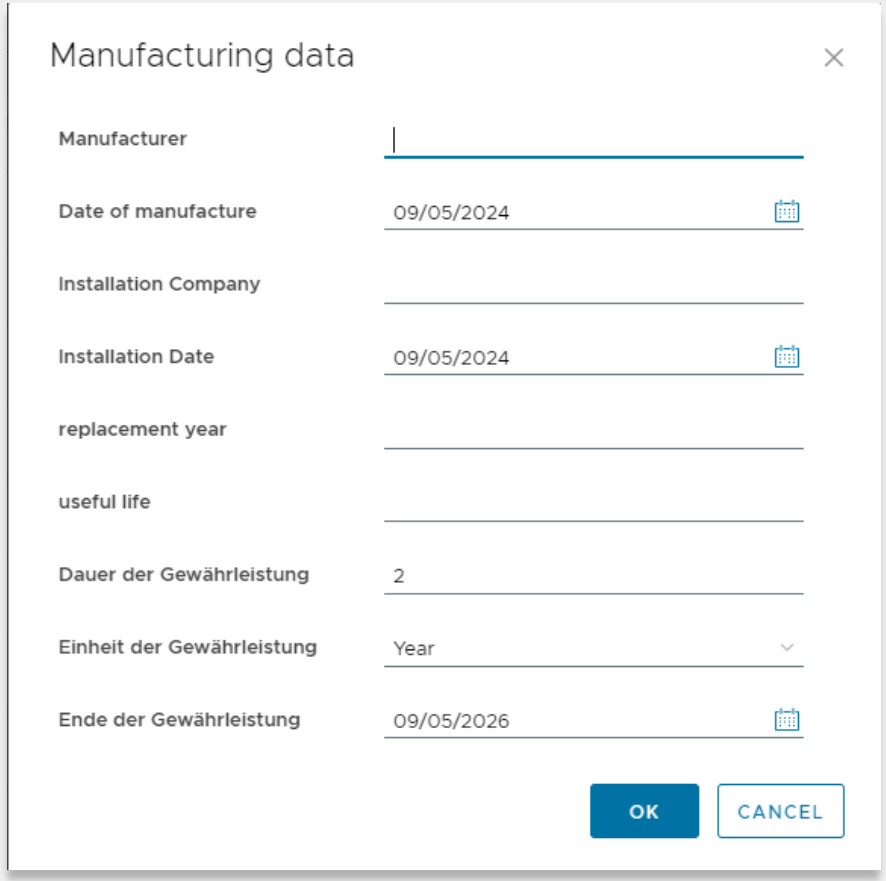
The integrated document management system offers convenient, object-based allocation of all documents that arise during the life of a system - from acceptance certificates to drawings.



Service Life Management

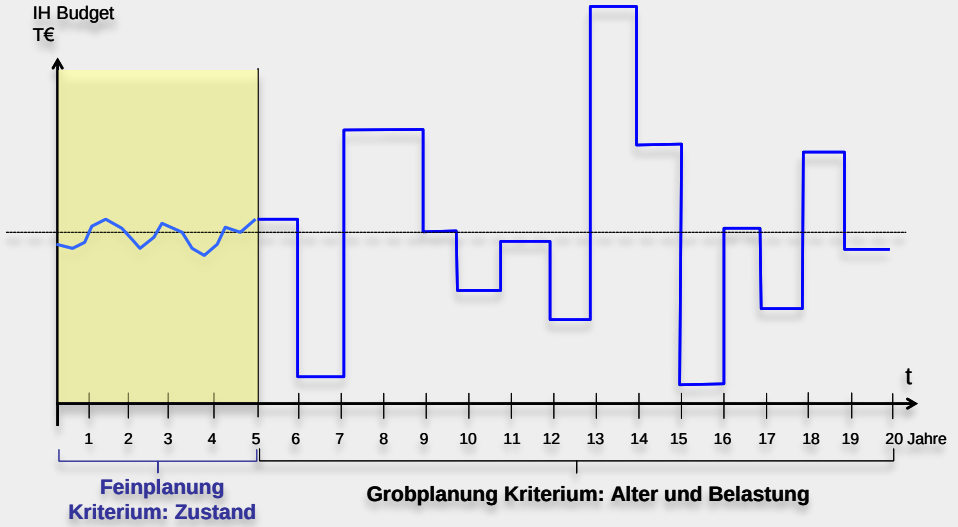
- The contents of the MR.pro® database contain all the information required for long-term planning > 5 years - in order to be able to make appropriate deductions:
  - Property type, operating load, configuration, condition development over time

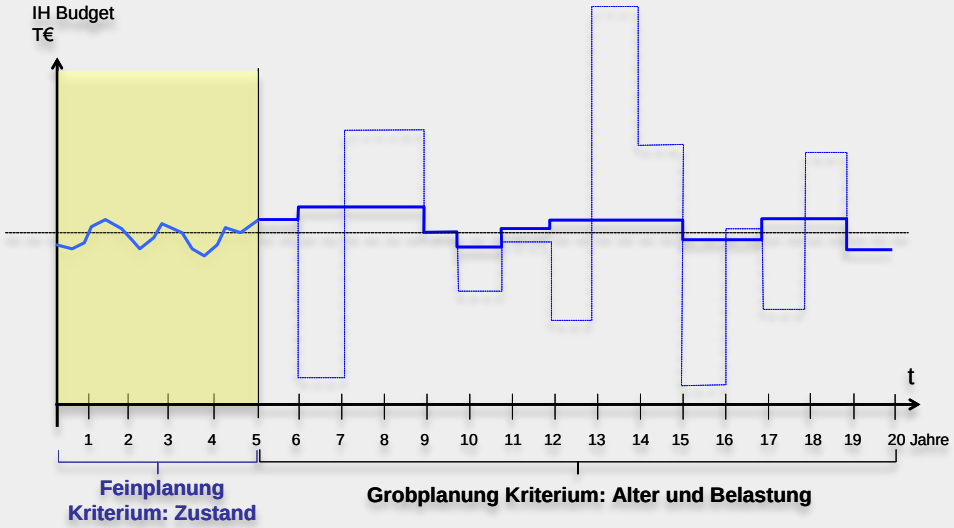
- If reliable empirical values are available for a representative cross-section of properties, they can be used to derive average values for economic service life at assumed values, which represent the necessary input for service life management



Short and Long Term Planning

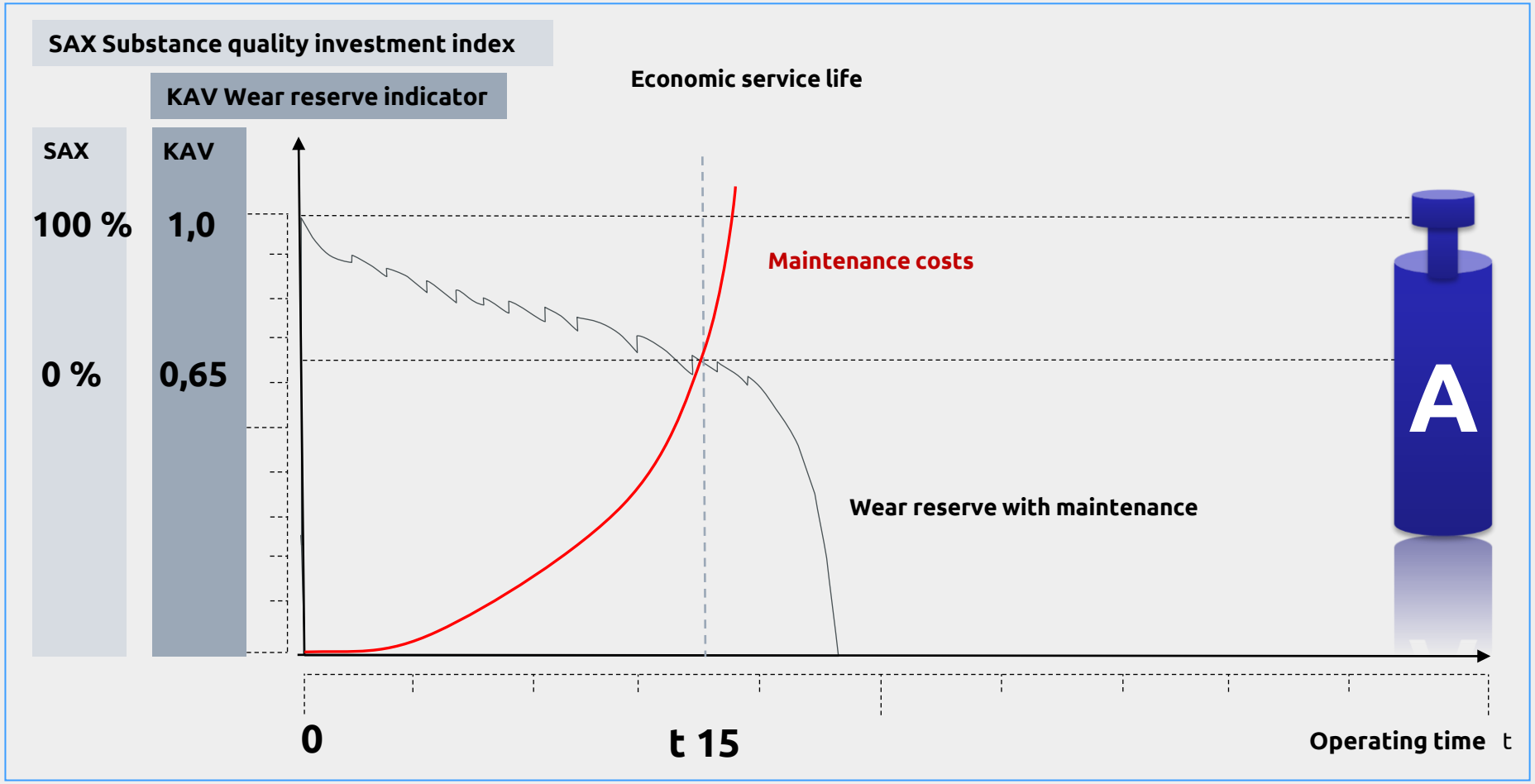
- Empirical knowledge about the average service life of properties, differentiated according to the individual asset classes, enables a good forecast regarding the end of the economic useful life.
- Although long-term planning (t6 to t20) works with assumptions, it is sufficiently accurate as an early indicator in line with the Pareto principle (80/20).
- Early detection of fluctuations in demand in the maintenance budget
- Levelling out fluctuations in demand by postponing - bringing forward or shifting back
- **Avoids surprises in the long term!**



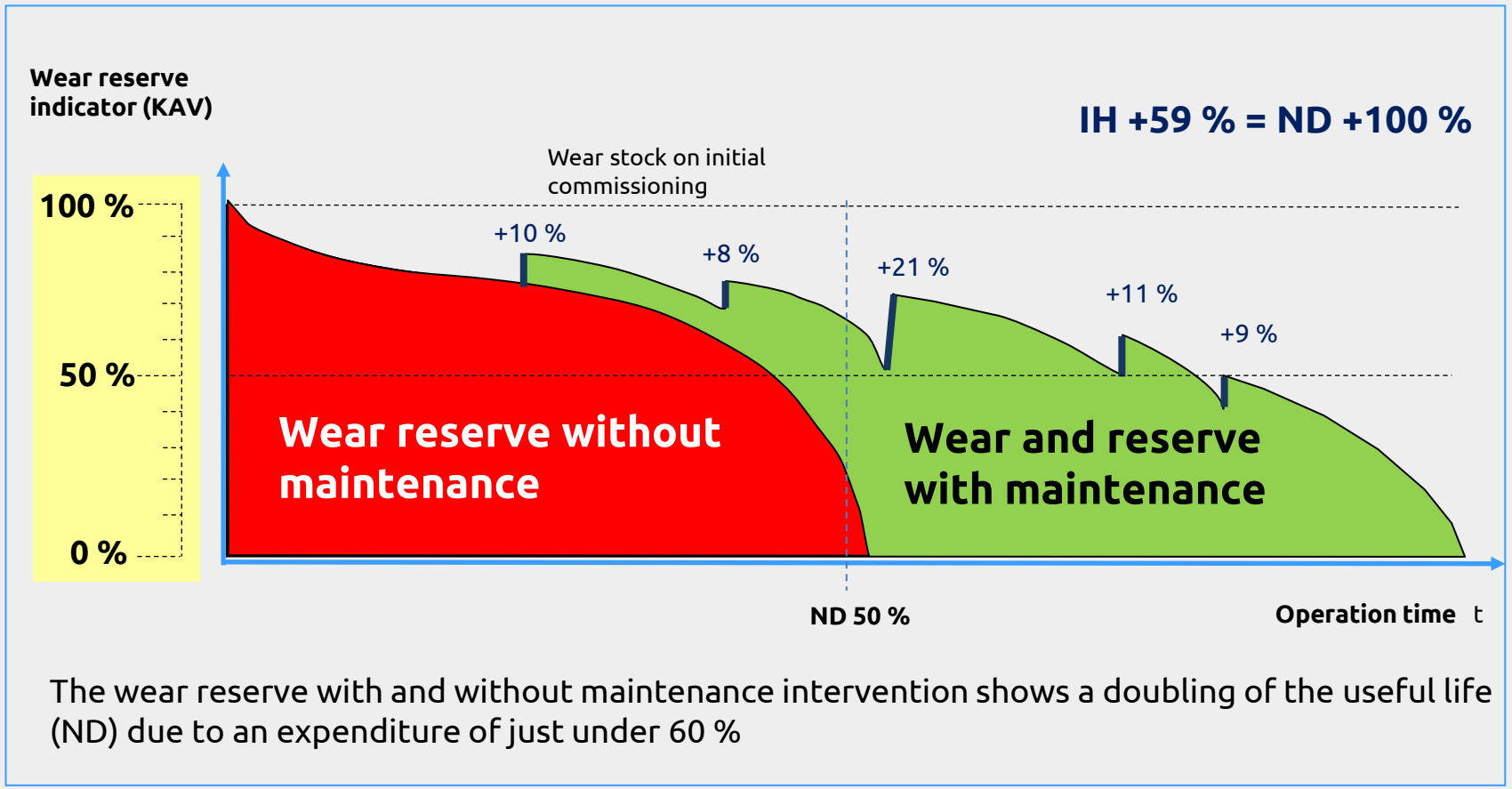


Wear Reserve Indicator - KAV ®

Switches and crossings and their load-dependent, empirically determined service life



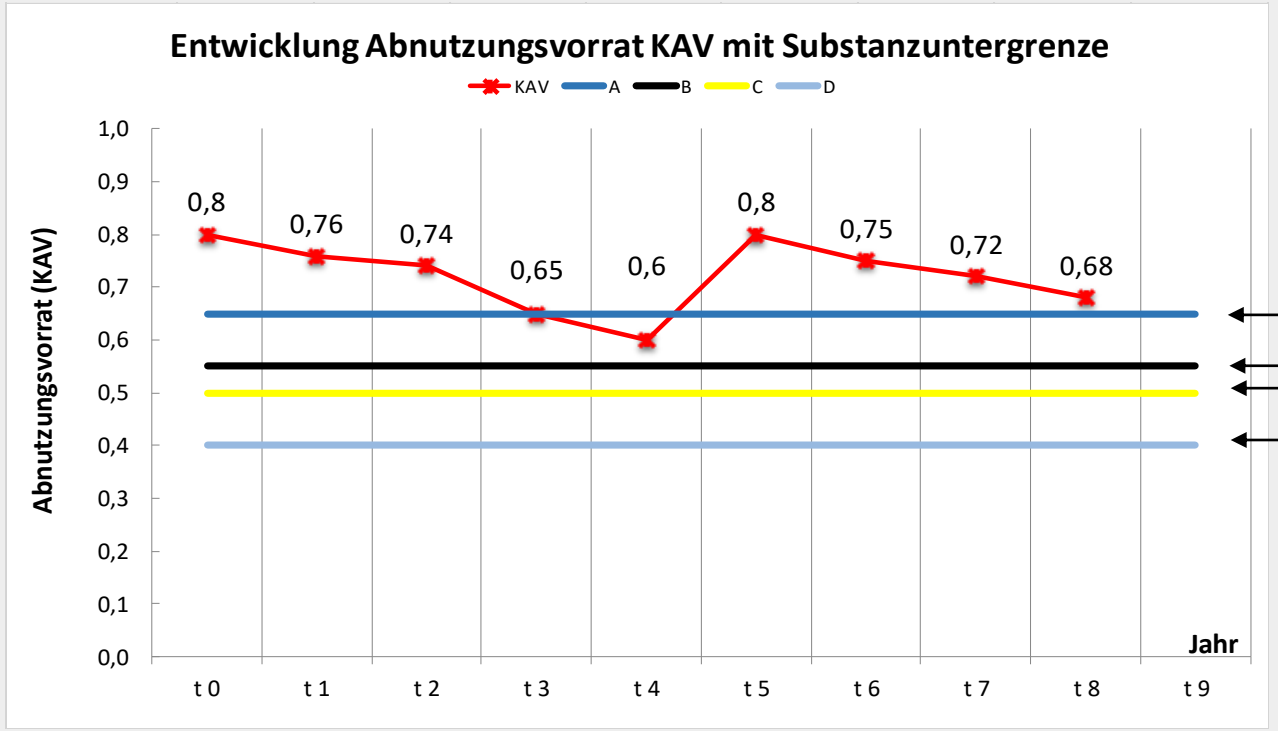
Net Asset Value or Residual Wear on the System



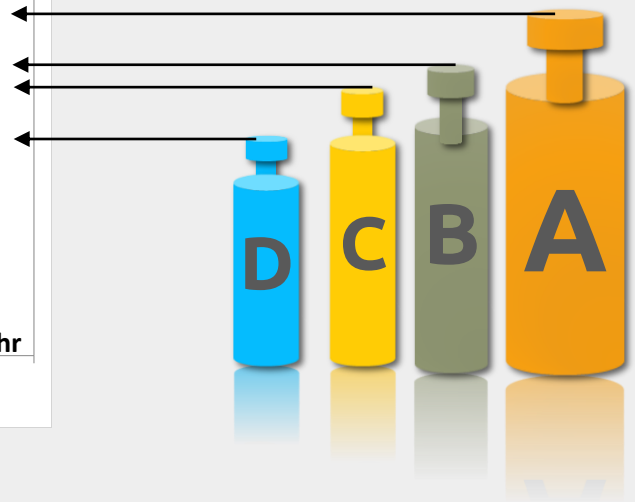
The wear reserve with and without maintenance intervention shows a doubling of the useful life (ND) due to an expenditure of just under 60 %

KAV® Graded According to Asset Classes

Example of load-oriented differentiated lower limits for substance quality
KAV: A = 0,65 B = 0,55 C = 0,5 D = 0,4
(must be individually adapted to the respective operational situation)

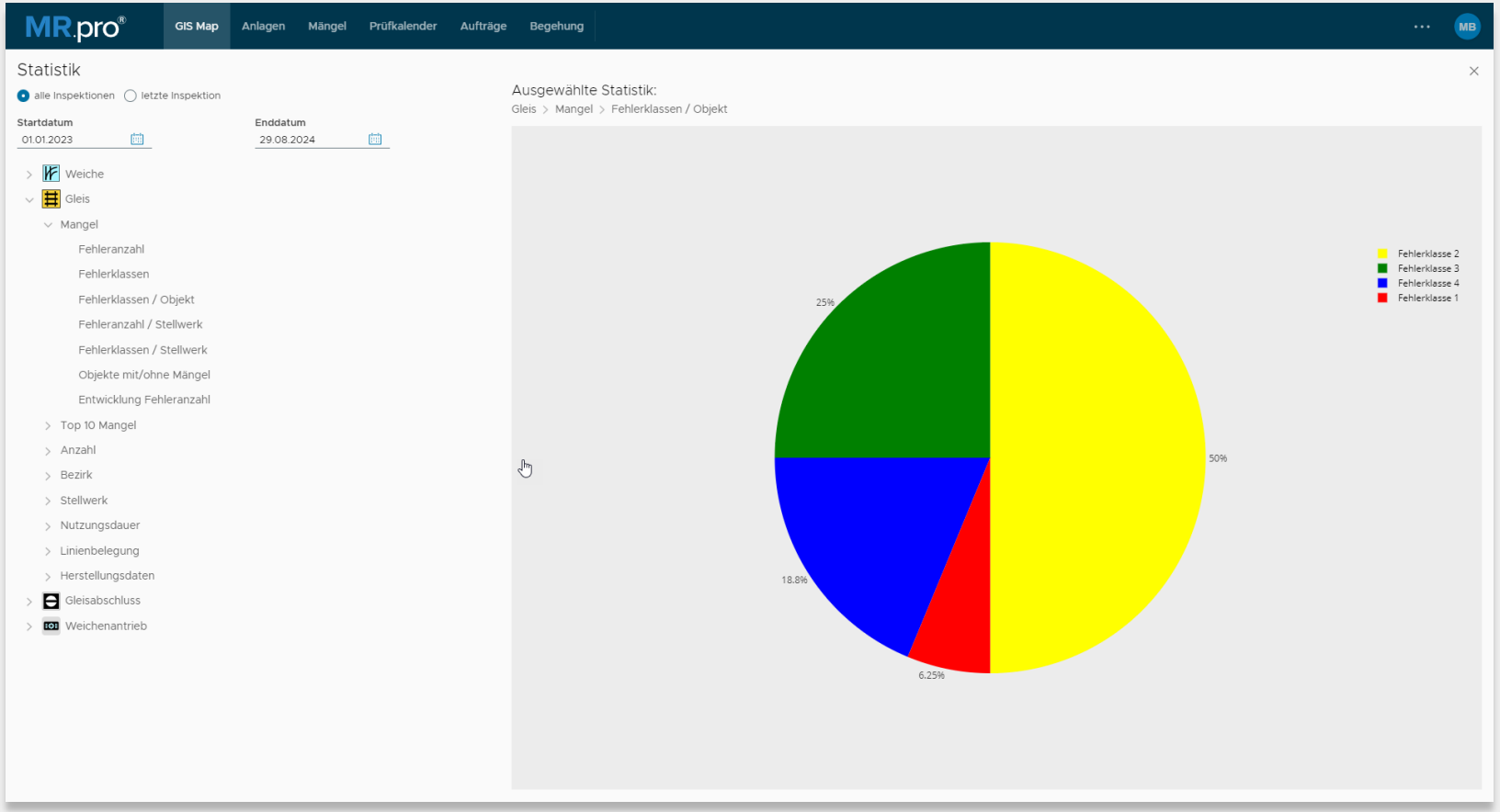


Asset classes



Statistics

Differentiated overviews that can be freely generated in terms of content make it easier to analyze weak points and make maintenance decisions.



Data as a Service (DaaS)

is a data management that uses the cloud to enable the storage, integration and processing of data and provide analytics services.

- Measurement
- Visual inspection
- Classification

Data as a Service

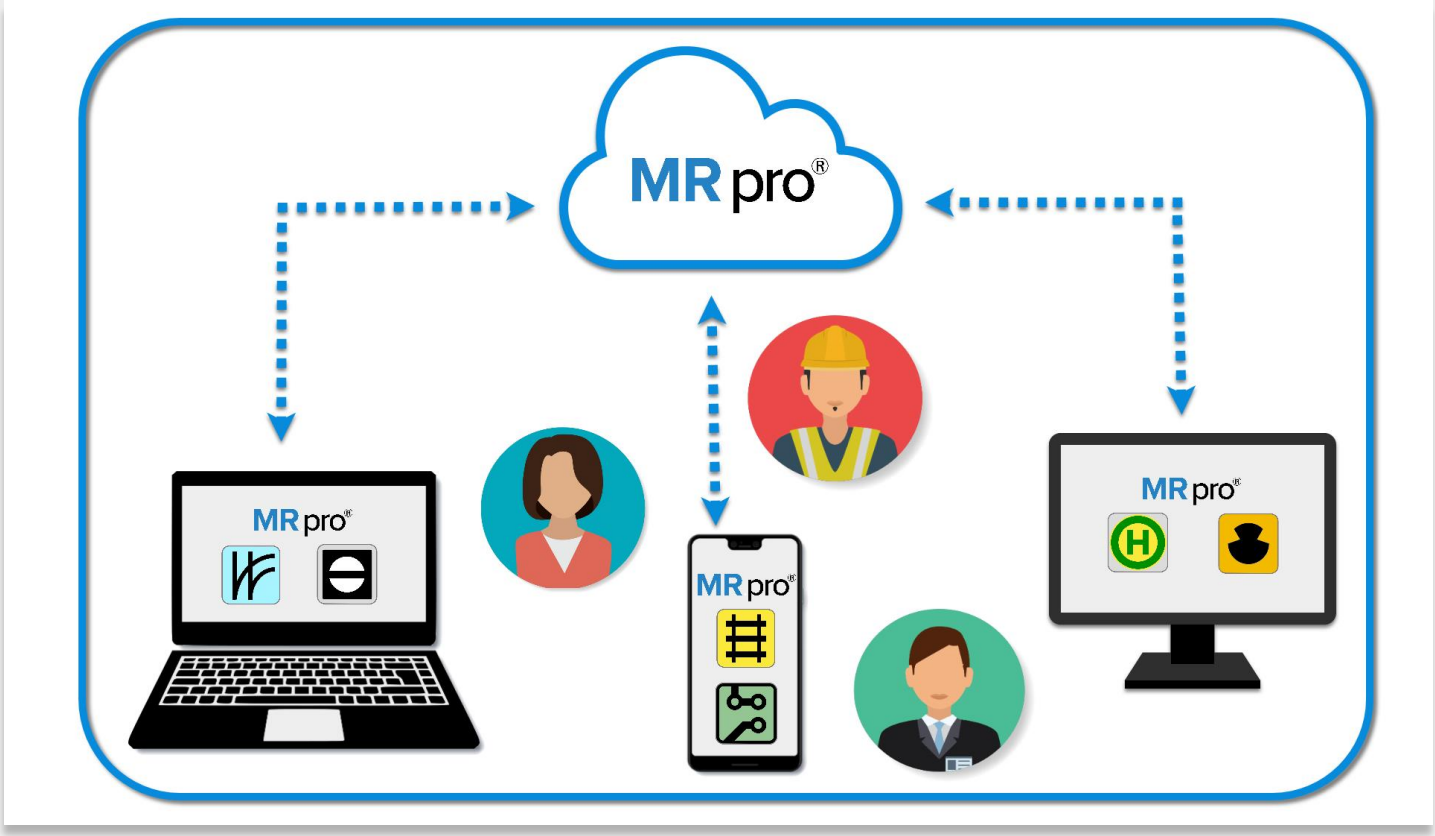
Process data

Analyze data

MR.pro®

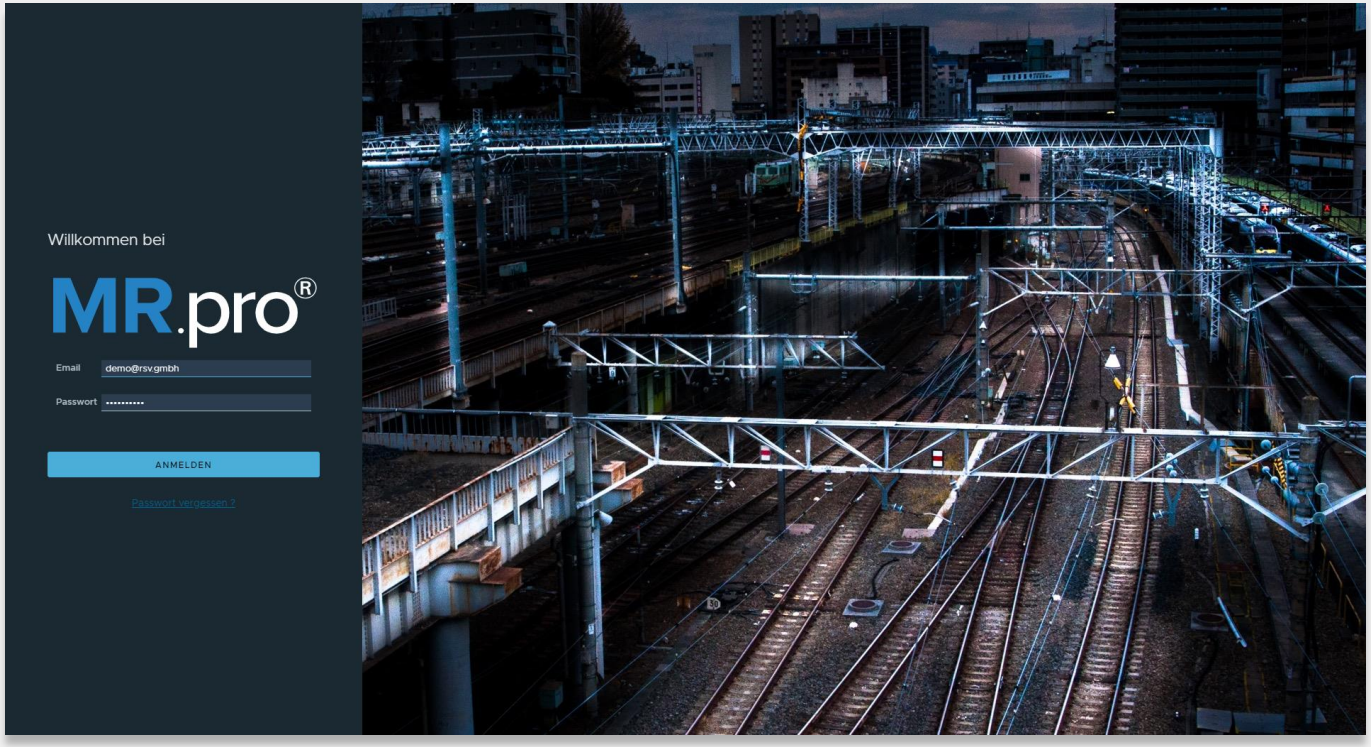
Goal: turning data into information

Platform-independent Structure



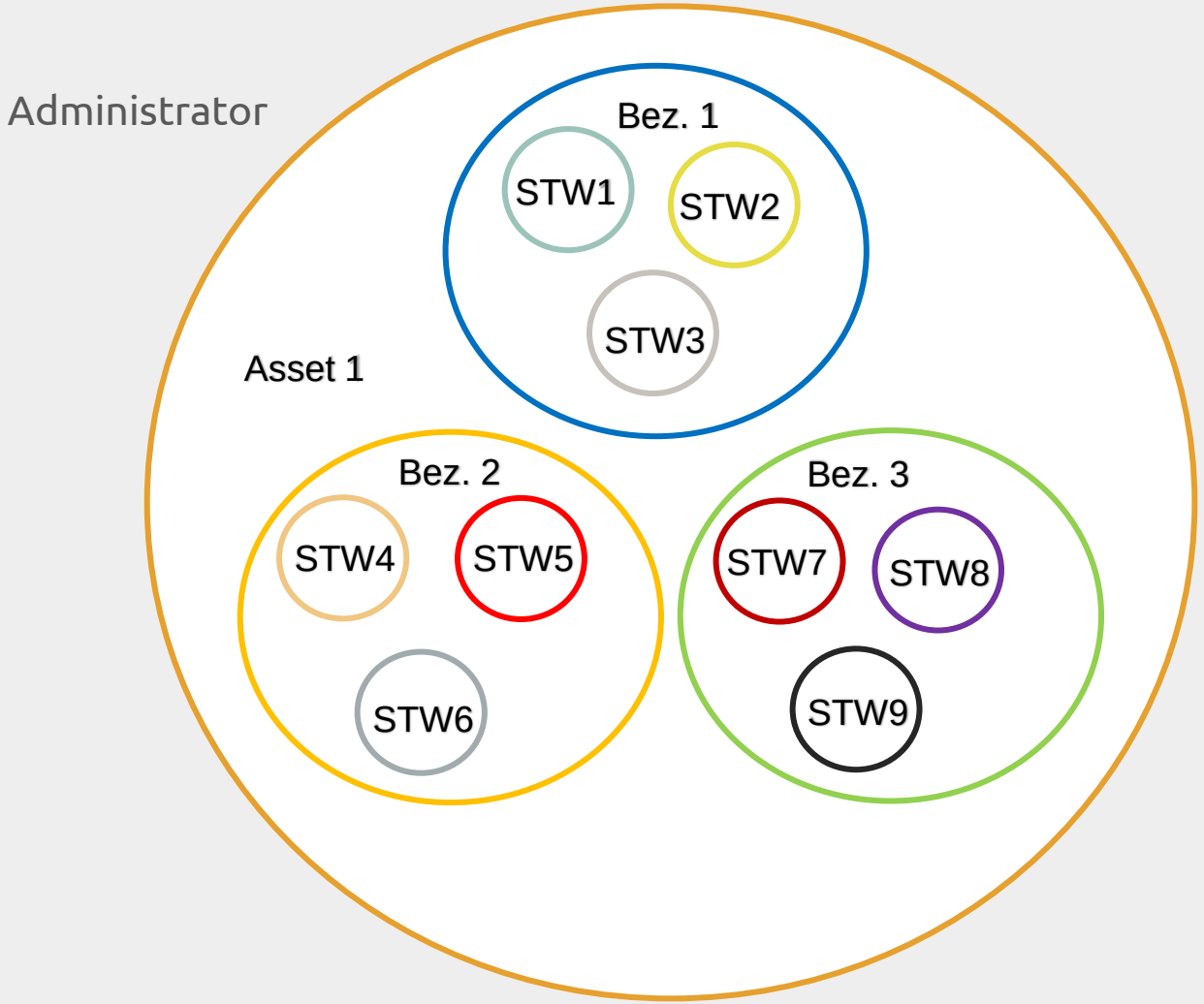
Access and Rights Management

- Multi-user system
- Online application
- Graduated user & rights management
- Multilingual
  - German
  - English



The integrated user and group management allows you to control authorization and access down to individual system objects.

Example: Group Assignment



Plant manager
- read / write Bez1-Bez3

District manager 1
- read / write STW1-STW 3
- read Bez.2 and Bez.3

District manager 2
- read / write STW4-STW 6
- read Bez.1 and Bez.3

District manager 3
- read / write STW7-STW 9
- read Bez.1 and Bez.2

Signal box supervisor 1
- read / write STW1
- read STW2 and STW3

…. etc.

„*Simplify Database*“ for Railway Tracks

- Some transport companies get off to a flying start in digital infrastructure data management because they use a “ready to work” solution with the combination of service and software and hardware delivery.

- RSV calls this combined solution “Simplify Database” for track systems, which creates a reliable data situation from inventory and condition information in the shortest possible time. First of all, the information required for maintenance planning and control is preconfigured with the operator. This includes details on assessment and classification procedures, interfaces and the further processing of condition information in planning and/or geographic information systems (GIS), which are determined in advance.

„Simplify Database“ for Railway Tracks

- During further implementation, RSV's specialists - also together with the infrastructure’s specialist staff - create a complete database when taking stock of the track and switch systems.

- MR.pro is provided with all inventory and condition data in line with customer requirements. Our team of experts is available for all further inspections. Optionally, the inspection equipment can be handed over to the operator after intensive training and the “flying start” can be professionally supported and supervised.

Your Benefits

- The software was and continues to be developed directly by the user – by experts and with a high practical value
- Reduction of planning, control and documentation effort
- Reliable documentation of the operational and functional safety of the system, updatable and suitable as a life file
- Geo-referenced track graphics for system statuses, loads, designs and freely definable properties
- Digital data provision for decentralized and centralized access as well as long-term analyses and tracking of condition development
- Integrated deadline and warranty tracking
- Support for decision-making processes and prioritization
- Daily status reports and statistical evaluations Condition monitoring and weak point analysis
- Service life management and condition forecasting

References

- Azienda Trasporti Milanesi, Mailand
- Basler Verkehrs-Betriebe
- BASF Schwarzheide
- Bern Mobil
- Braunschweiger Verkehrs GmbH
- Bremenports
- CFL Luxembourg
- Compagnie des Transports de Strasbourg
- DB Fahrzeuginstandhaltung Krefeld
- DB Regio RheinNeckar
- De Lijn, Antwerpen
- De Lijn, Gent
- De Lijn Oostende
- Dresdner Verkehrsbetriebe AG
- EVB, Bremervörde
- Evonik, Marl
- Farge-Vegesacker Eisenbahn
- Grillo Werke AG
- Hafen Stuttgart GmbH
- Hamburg Port Authority AöR
- Hansebahn Bremen GmbH
- Havelländische Eisenbahn AG
- HEAG Mobilo, Darmstadt
- IFTEC GmbH & Co. KG Leipzig
- InfraLeuna GmbH
- InfraServ Knapsack
- Keolis, Dijon
- Keolis, Lyon
- Kölner Verkehrs-Betriebe AG
- Kasseler Verkehrs-Gesellschaft AG
- Lappwaldbahn Service GmbH
- LiA, Le Havre

- Magdeburger Verkehrsbetriebe GmbH
- Mainzer Verkehrs Gesellschaft
- Mecklenburgische Bäderbahn Molli
- Münchner Verkehrsgesellschaft mbH
- OMV AG Wien u. Burghausen
- RATP, Paris
- Regiobahn Bitterfeld Berlin GmbH
- Rhein-Neckar-Verkehr GmbH
- Rheinhafen Krefeld
- Rheinhäfen Karlsruhe
- RSAG Rostock
- Saarbahn Netz GmbH
- Schweizerische Rheinhäfen, Basel
- SInON, Celle
- Solvay Bernburg
- Stadtwerke Krefeld Mobil
- Städtische Häfen Hannover
- Teutoburger Wald-Eisenbahn
- ThyssenKrupp Logistics Services, Duisburg
- VAG Verkehrs-AG Nürnberg
- Verkehrsbetriebe Karlsruhe GmbH
- Verkehrsbetriebe Zürich
- Vossloh Rail Service versch. Standorte
- …

„ Audience Choice Award “for MR.pro

Rhomberg Sersa Vossloh has won one of the coveted Innovation Awards at the renowned rail trade fair RailTech Europe 2024 with the “Audience Choice Award”.The company was nominated for its MR.pro® asset management software, which specializes in rail infrastructure and has been tried and tested for 20 years - and won.

Photo from left: Mario RAINER (Head of Software Development) and Sebastian MEYER (Managing Director of RSV) were delighted to win the “Audience Choice Award” for MR.pro®.

Thank you for your Interest

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