



Industrial 5G activities at DB

Insights from an end user perspective

18. November 2025 | Virtual Mobile Test Summit 2025 | Jens Liebel, Alexander Bentkus

- 1. Overview of Deutsche Bahn**
2. PoC at the maintenance depot in Krefeld
3. Rollout of Industrial 5G networks and use case developments at Deutsche Bahn
4. Conclusions and recommendations

Overview Deutsche Bahn



DB Fernverkehr

~650
ICE & IC

Offers comfortable and **environmentally friendly high-speed travel within Germany** as well as to neighbouring countries

DB Regio

> 4,000
Train Sets

Core service is to transport > **4.5 million passengers every day** in a punctual, safe, comfortable and ecological manner

DB Cargo

222 million tons
freight 2023

2600 locomotives transport and shunt the goods with **~82.000 freight wagons** every day

DB InfraGO

~ 5.400
Railway Stations

With **700 reception buildings** and around 850,000 square meters of rental space, we create a place for our **20 million customers every day**

DB InfraGO

~33,400 km
Rail Network

Operation and maintenance of **Europe's largest rail network**, which is used daily by 50,000 trains and 450 railway undertakings

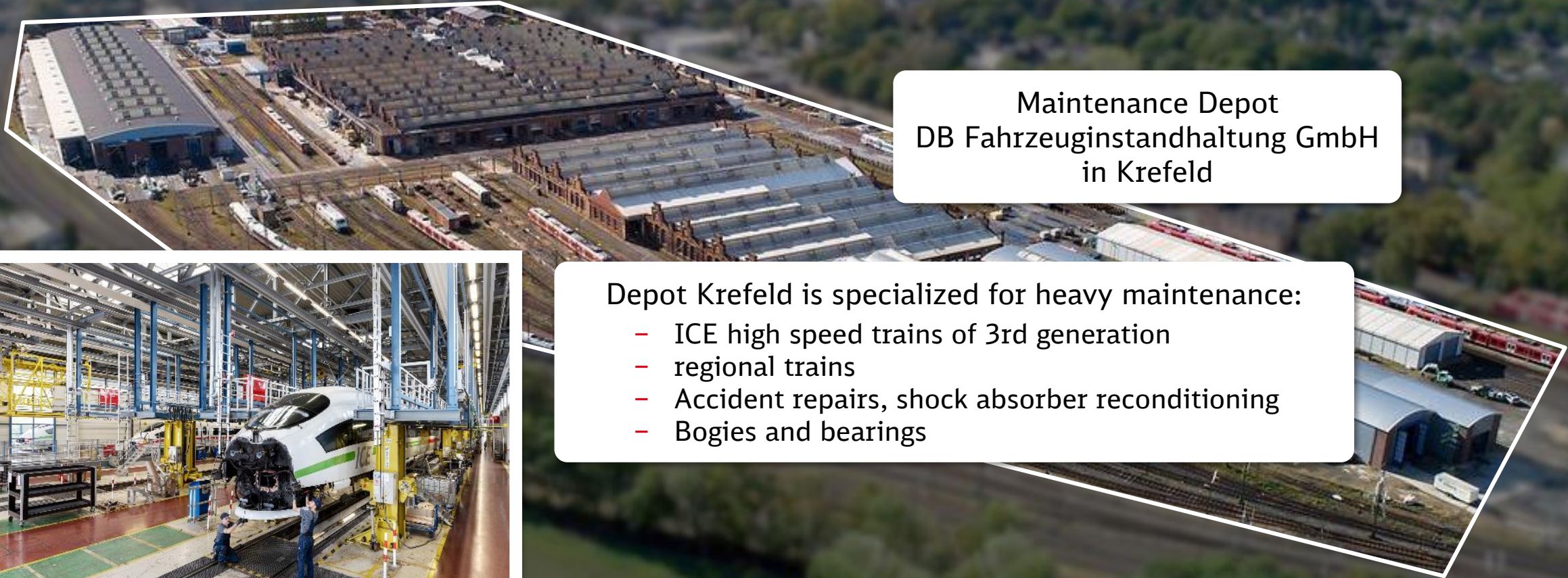
DB Maintenance

Over 100
Maintenance Centers

In approximately **100 plants nationwide**, trains and wagons are maintained and repaired every day

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Technical-economic evaluation of the 5G campus network solution



Maintenance Depot
DB Fahrzeuginstandhaltung GmbH
in Krefeld



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Depot Krefeld is specialized for heavy maintenance:

- ICE high speed trains of 3rd generation
- regional trains
- Accident repairs, shock absorber reconditioning
- Bogies and bearings

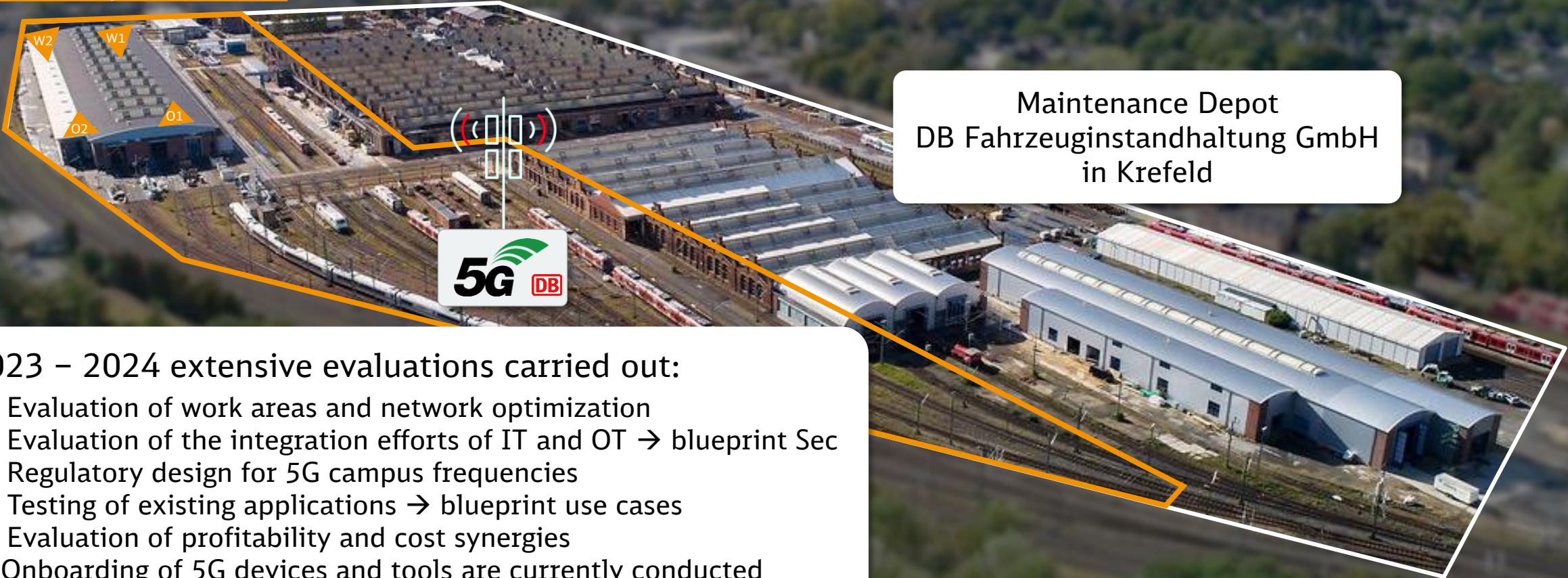
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Technical-economic evaluation of the 5G campus network solution



5G campus network



2023 – 2024 extensive evaluations carried out:

- Evaluation of work areas and network optimization
 - Evaluation of the integration efforts of IT and OT → blueprint Sec
 - Regulatory design for 5G campus frequencies
 - Testing of existing applications → blueprint use cases
 - Evaluation of profitability and cost synergies
- Onboarding of 5G devices and tools are currently conducted

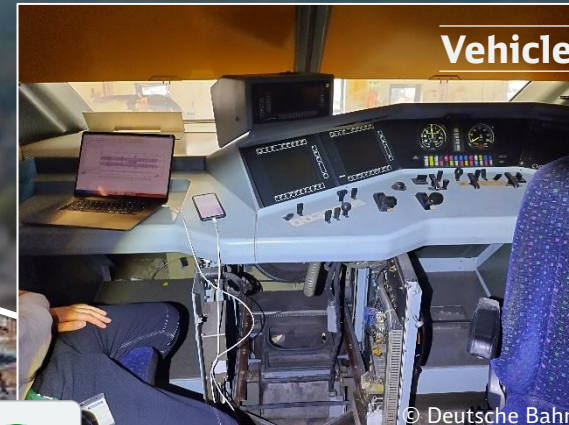
Technical-economic evaluation of the 5G campus network solution



Application requirements

Powerful and reliable connectivity

- on the shopfloor
- in the vehicles
- in the pits
- in outdoor areas



Business needs

Operationally stable and economical connectivity

- low OPEX
- low CAPEX
- reliability
- safety
- availability
- sustainability



→ Positive technical and economic evaluation

Exemplary use cases, which requires reliable connectivity service



1. Availability by phone

Internally via MS Teams on the entire company premises and (needed) externally via roaming



2. Digital documentation via Tablets

Everywhere (shopfloor, pit, vehicle and outdoor) without disconnection



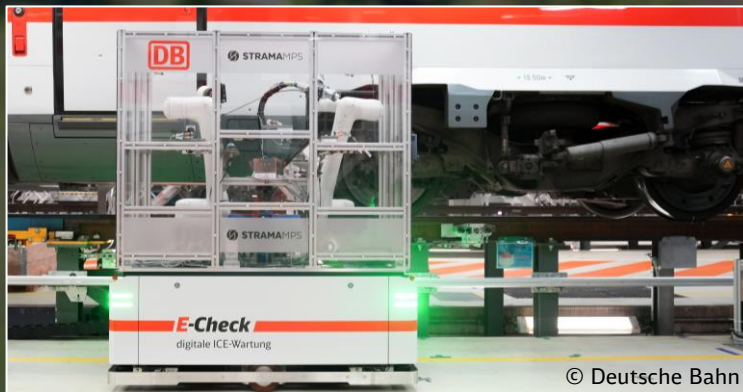
3. Vehicle software updates

access only in the vehicle possible and requires live connection to a specialized DB update server



4. Intralogistics

Autonomous transportation of cargo transport containers, bogies and for material disposition



5. Production tools

wireless tools for the documentation of critical work processes



6. Mobile Underfloor inspection

Safety-compliant operation of autonomous underfloor inspection technology



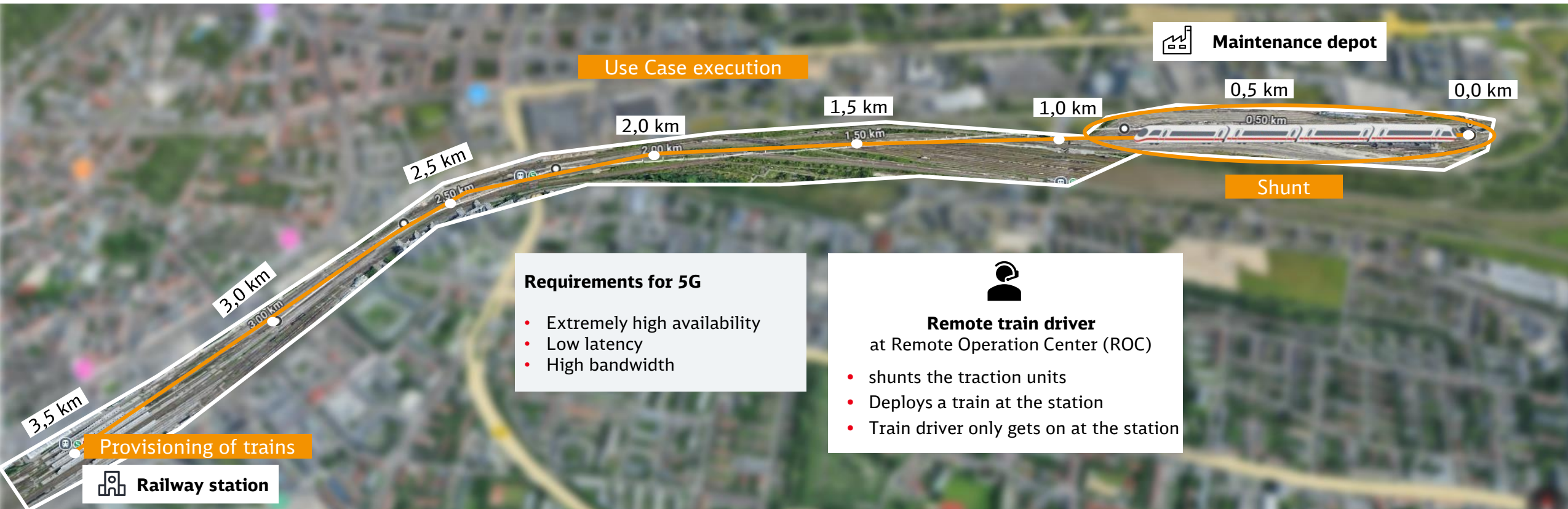
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Outlook: New use cases with industrial 5G networks



Use Case: Remote Train Operation

The industrial 5G network ensures reliable connectivity between the long-distance train driver and the train



Rollout of Industrial 5G networks and use case developments



Bahn München

- 5G test network with gradual expansion of the corridor to Munich East station for deployment
- Testing of Remote-Train / Automatic Train Applications



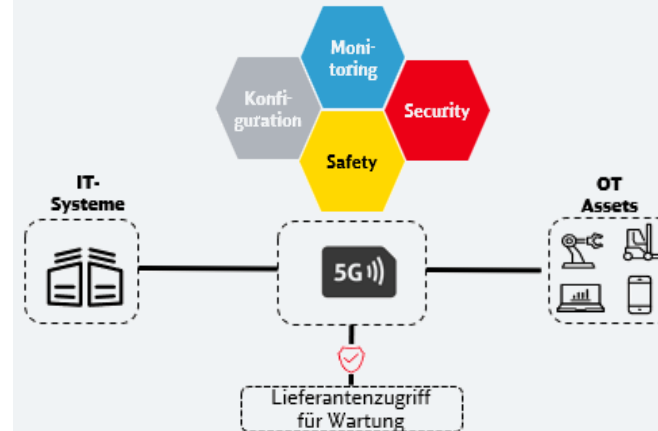
Bahn Hamburg

- Multi-site 5G test network with a central core network hosted on DB servers
- Testing of outdoor underfloor robotics applications



Fahrzeuginstandhaltung GmbH Depot Krefeld

- 5G test network for onboarding MDM devices (tablets, smartphones) and MTAs (machines, tools)
- 5G test network will be used for further OT/IT security issues



Fahrzeuginstandhaltung GmbH Depot Bremen

- (planned) 5G productive network for the Bremen plant from 2026

Fahrzeuginstandhaltung GmbH Depot Cottbus

- 5G productive network for the Cottbus plant Phase I from 2026
- (planned) 5G productive network for the Cottbus plant Phase II from 2027



- More in discussion / planning

New maintenance depot in Cottbus with the first private 5G network



new
hall 1

existing
hall



new
hall 2

The new depot in Cottbus

- Start of construction in 2021 with completion of hall 2 in January 2024
- Completion of hall 1 planned for the end of 2026
- Heavy maintenance for the ICE4 fleet
- [Website of the project](#)

Die Halle 1

Fünf Gebäudeteile: eine Werkhalle

For more details about the project, please
visit the website

<https://www.db-neues-werk-cottbus.com/>

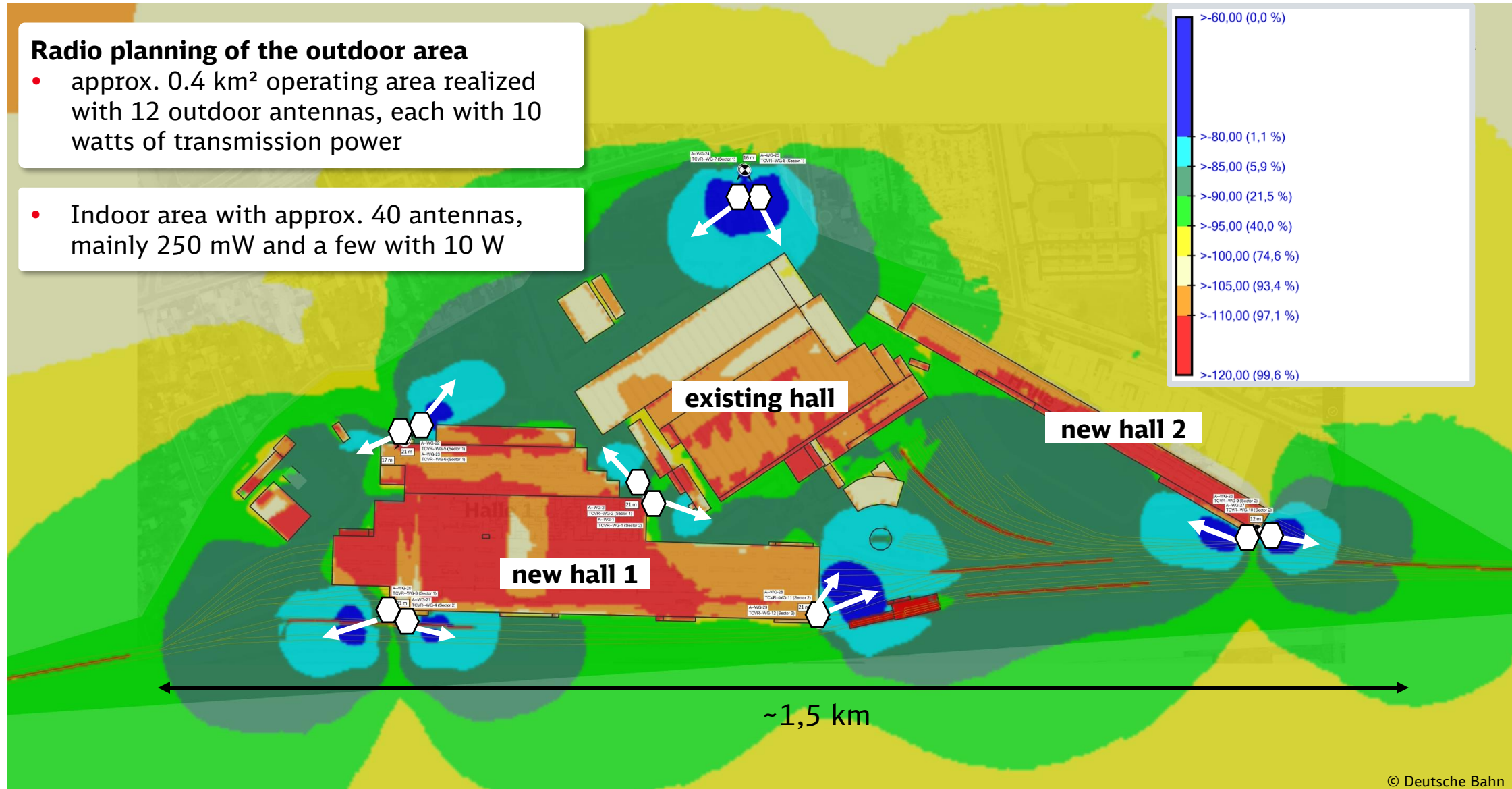


Radio planning of the new maintenance depot in Cottbus



Radio planning of the outdoor area

- approx. 0.4 km² operating area realized with 12 outdoor antennas, each with 10 watts of transmission power
- Indoor area with approx. 40 antennas, mainly 250 mW and a few with 10 W



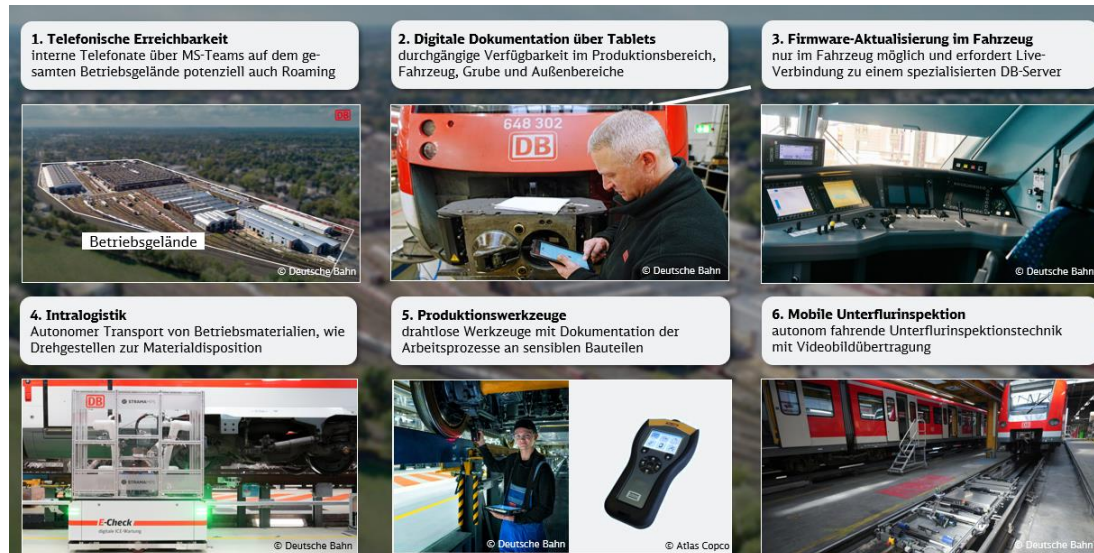
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Conclusions and recommendations



Industrial 5G enables optimal connectivity

- The 5G campus network offers connectivity in all DB operating areas and economic advantages the larger the site to be covered
- The execution of today's DB applications is stable in all operating areas
- New use cases are gradually being tested and implemented in the Krefeld Reference Network



Remaining challenges



Trans-
formation

- Added value of 5G over Wi-Fi
- Device migration / certification for the enterprise market



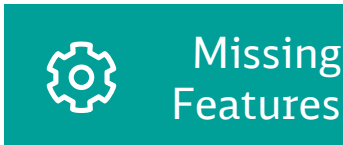
Network
Operation

- Organization 24/7 operation (NOC)
- Inhouse expertise of 5G (E2E)



IT/OT
Integration

- IT supplier interfaces/security
- IT interfaces for operations management (IEEE vs 3GPP)



Missing
Features

- Powerful localization functionalities
- Virtual Ethernet Port (PDU Session)

- **General: OT hardware with 5G interface**

