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DB CargoLab
Space for Innovation

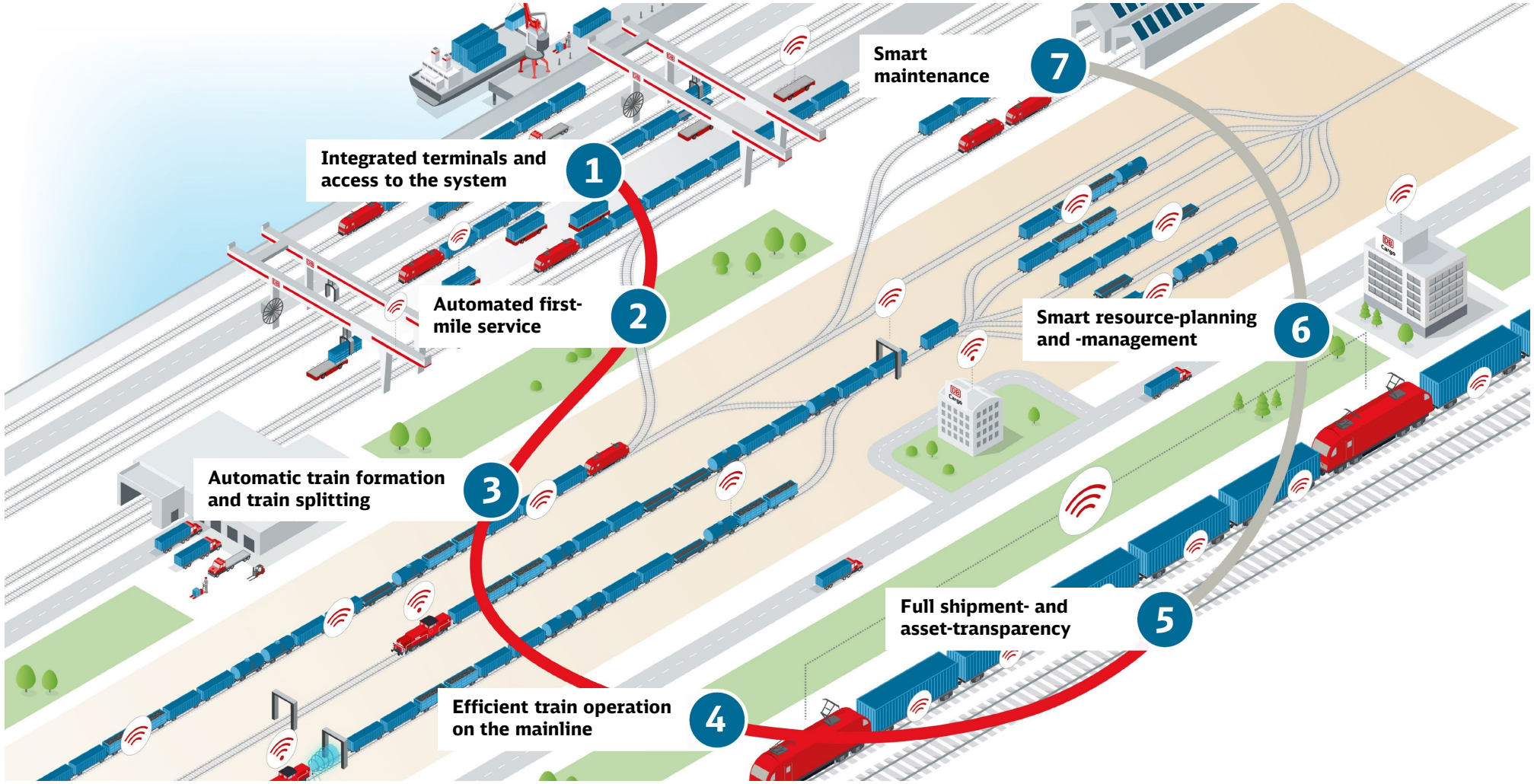
Our target vision: The Intelligent Rail Freight Transport System 2030+

Areas of Action for Digitalization & Automation in the Production of DB Cargo AG

January 2024

The intelligent rail freight transport system

Our target vision 2030+



With our innovation projects, we are enabling digitalization and automation in defined areas of action along the entire value chain. **For the future of rail freight transport.**

The intelligent rail freight transport system

Our target vision 2030+

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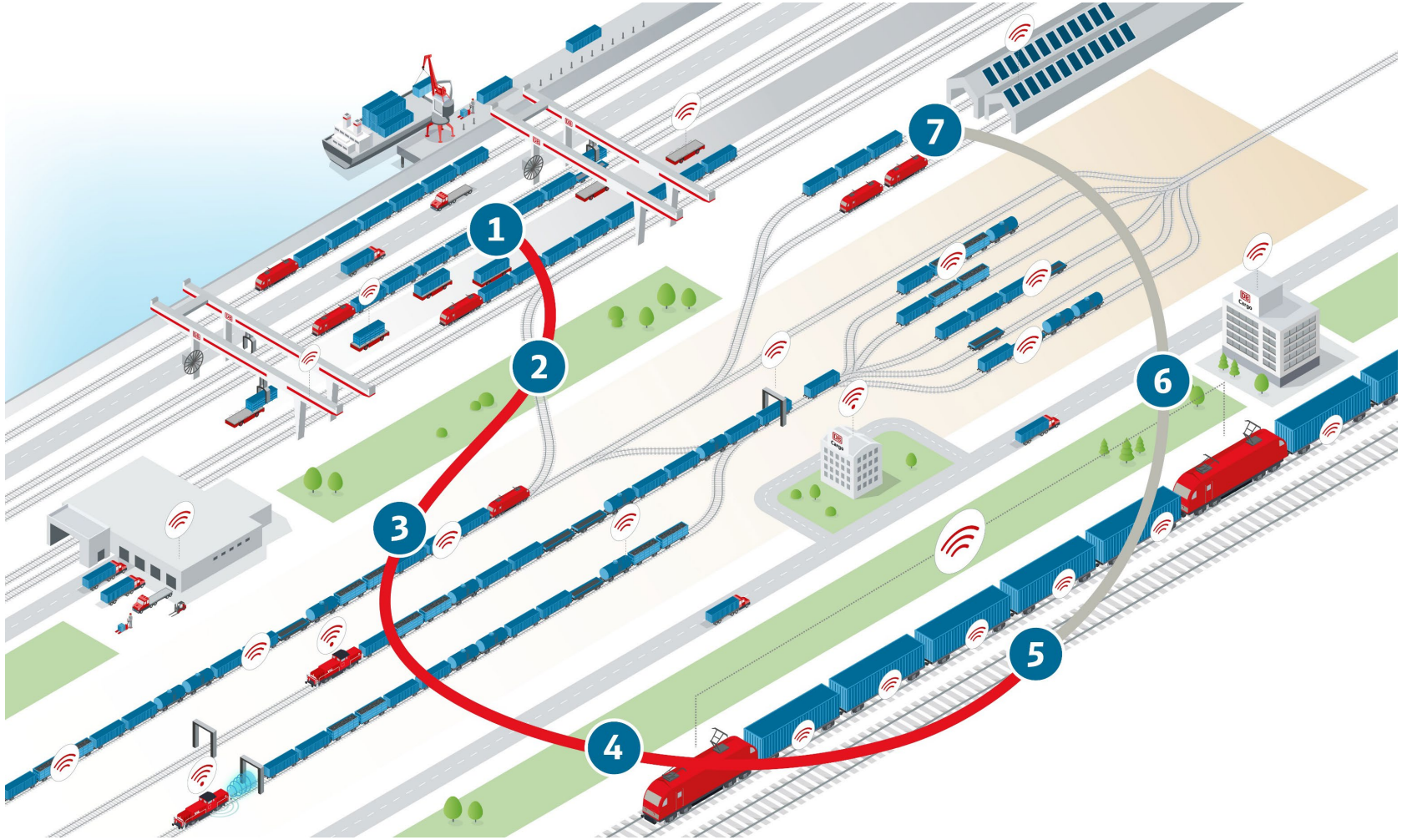

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1. **Integrated terminals and access to the system**
2. **Automated first-mile service**
3. **Automatic train formation and train splitting**
4. **Efficient train operation on the mainline**
5. **Full shipment- and asset-transparency**
6. **Smart resource-planning and -management**
7. **Smart maintenance**

Target vision
Intelligent Rail Freight Transport System 2030+

In the following part of the presentation, the seven different areas of action are described as parts of the target vision.

1. Integrated terminals and access to the system | Higher quality and speed

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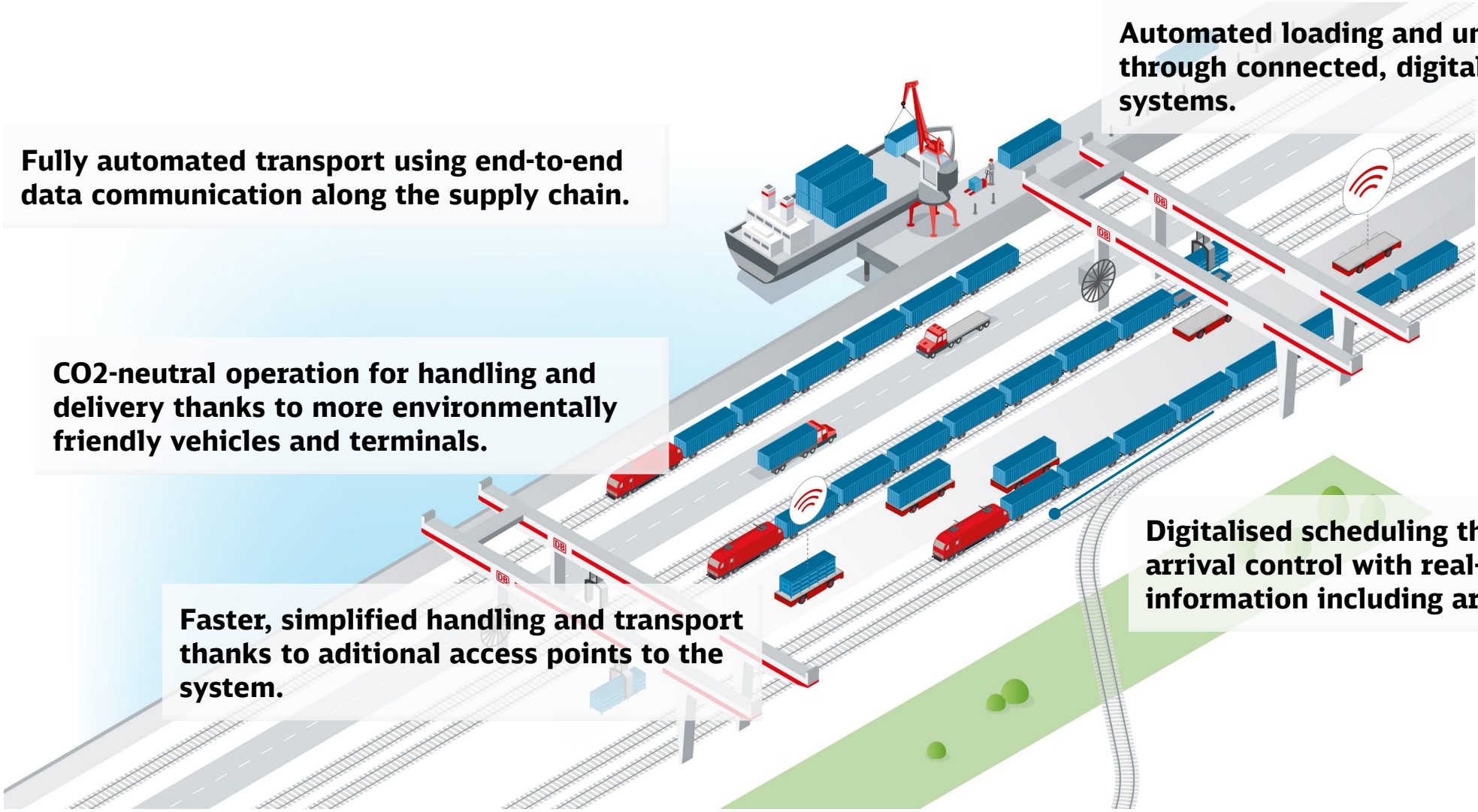
Automated loading and unloading through connected, digitalised terminal systems.

Fully automated transport using end-to-end data communication along the supply chain.

CO2-neutral operation for handling and delivery thanks to more environmentally friendly vehicles and terminals.

Digitalised scheduling through truck arrival control with real-time information including arrival times.

Faster, simplified handling and transport thanks to aditional access points to the system.



2. Automated first-mile-service | More flexible provision and collection of freight wagons

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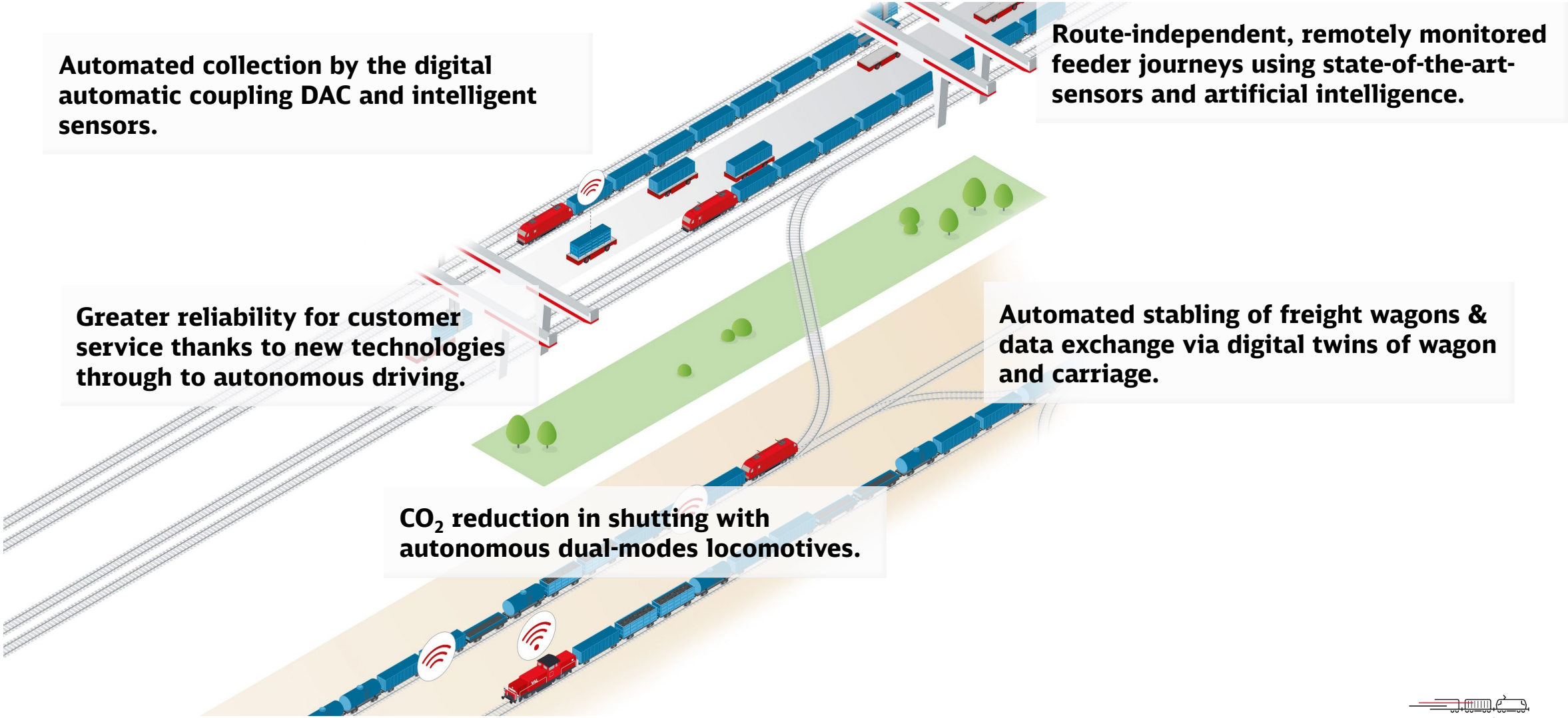
Automated collection by the digital automatic coupling DAC and intelligent sensors.

Route-independent, remotely monitored feeder journeys using state-of-the-art-sensors and artificial intelligence.

Greater reliability for customer service thanks to new technologies through to autonomous driving.

Automated stabling of freight wagons & data exchange via digital twins of wagon and carriage.

CO_2 reduction in shutting with autonomous dual-modes locomotives.



3. Automatic train formation and train splitting | Increase capacity and stability in single freight car transport

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More capacity and more frequent handling thanks to automated train formation processes.

Operational management and wagon deployment optimised through condition analysis using artificial intelligence.

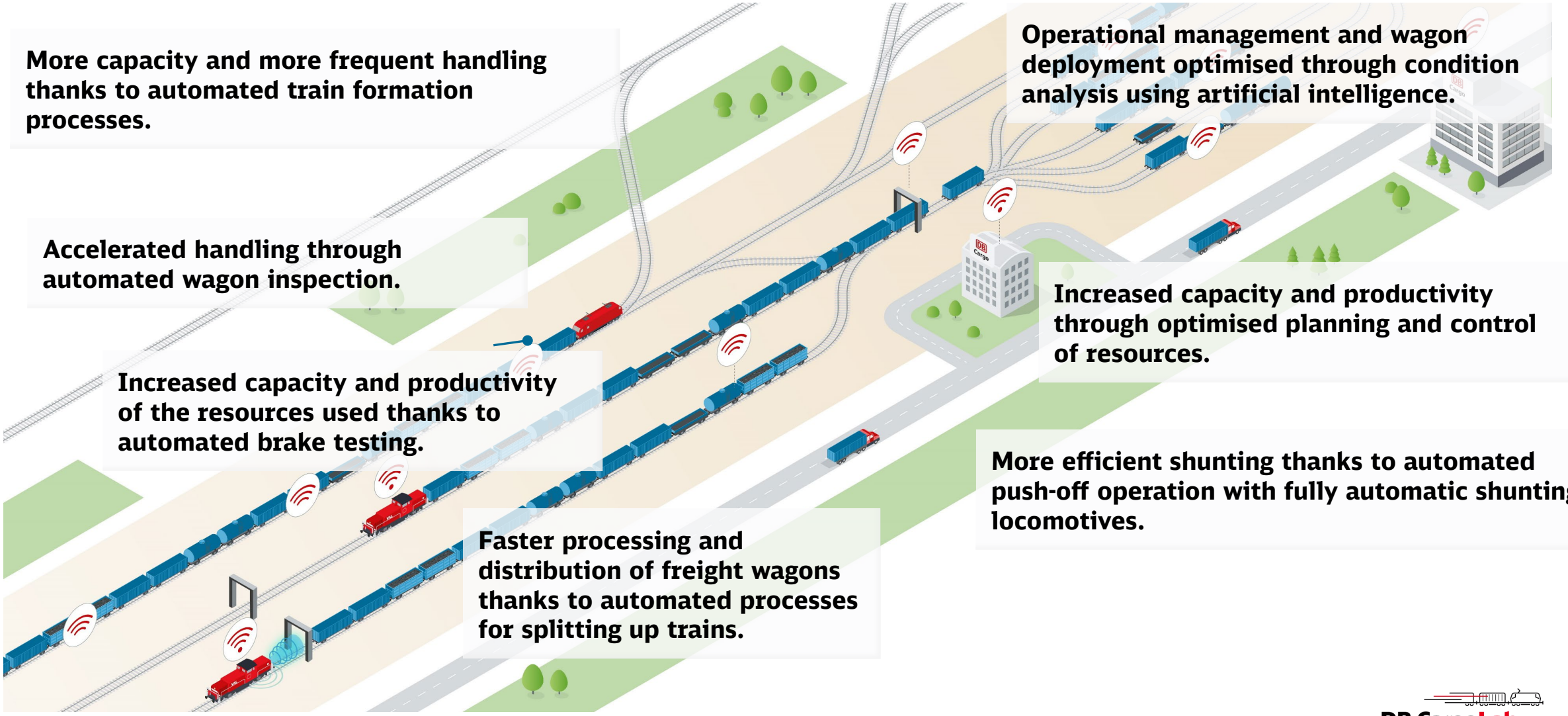
Accelerated handling through automated wagon inspection.

Increased capacity and productivity through optimised planning and control of resources.

Increased capacity and productivity of the resources used thanks to automated brake testing.

More efficient shunting thanks to automated push-off operation with fully automatic shunting locomotives.

Faster processing and distribution of freight wagons thanks to automated processes for splitting up trains.



4. Efficient train operation on the mainline | Increasing capacity and quality in operations

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Automated condition detection through self-diagnosis in real time using sensors.

Higher quality and shorter transport times in combination with energy savings thanks to automated trains.

Center for monitoring and remote control of automated trains.

Faster transport thanks to high-speed transport on the main corridors.

More capacity through longer and heavier trains thanks to optimised use of lovomotive tractive power.

5. Full shipment- and asset-transparency | Intelligent vehicles for the future of rail freight transport

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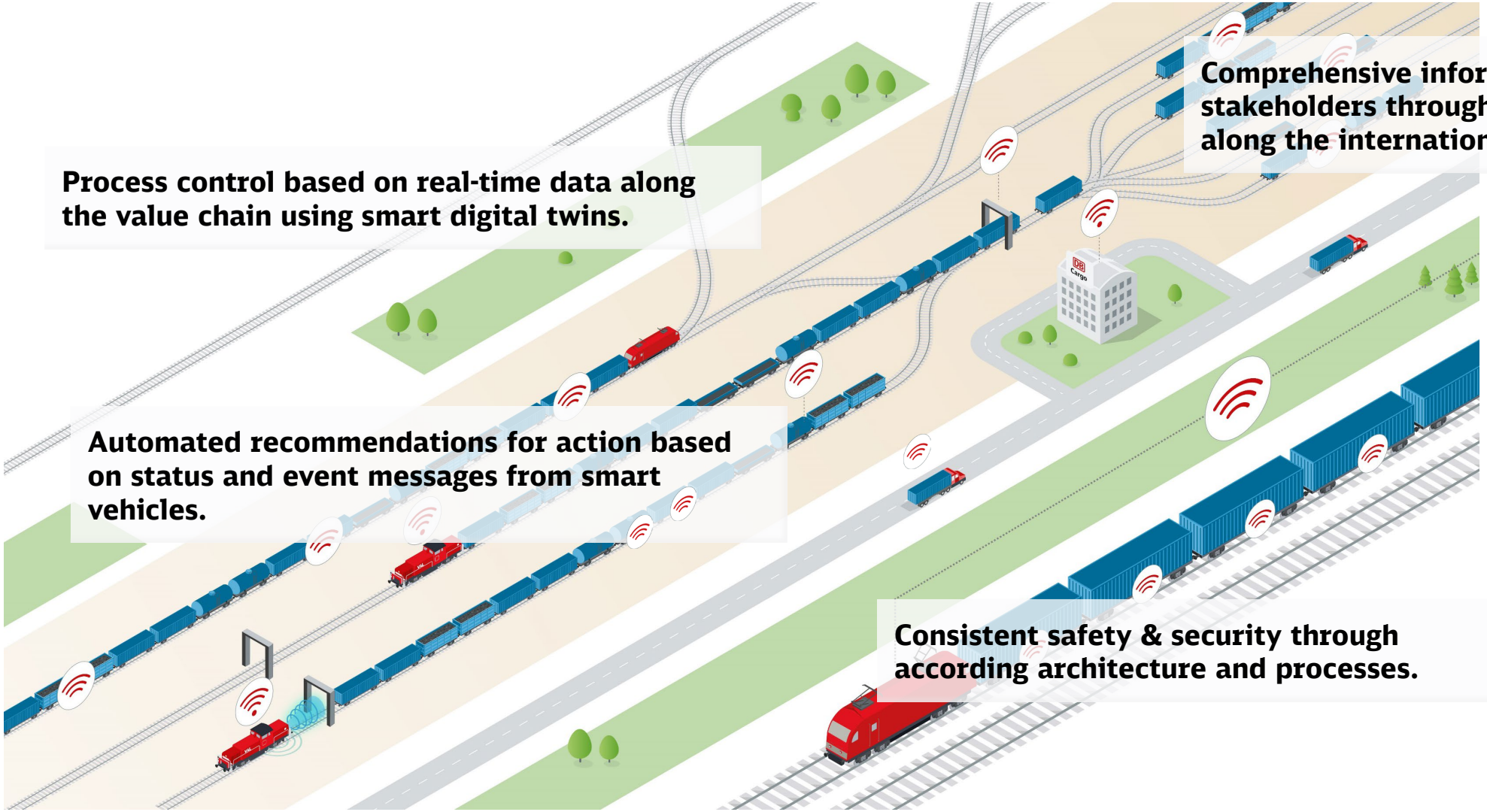

Process control based on real-time data along the value chain using smart digital twins.

Comprehensive information for all stakeholders through transparency along the international value chain.

Automated recommendations for action based on status and event messages from smart vehicles.

Consistent safety & security through according architecture and processes.

6. Smart resource-planning and -management | Reliability and transparency in production

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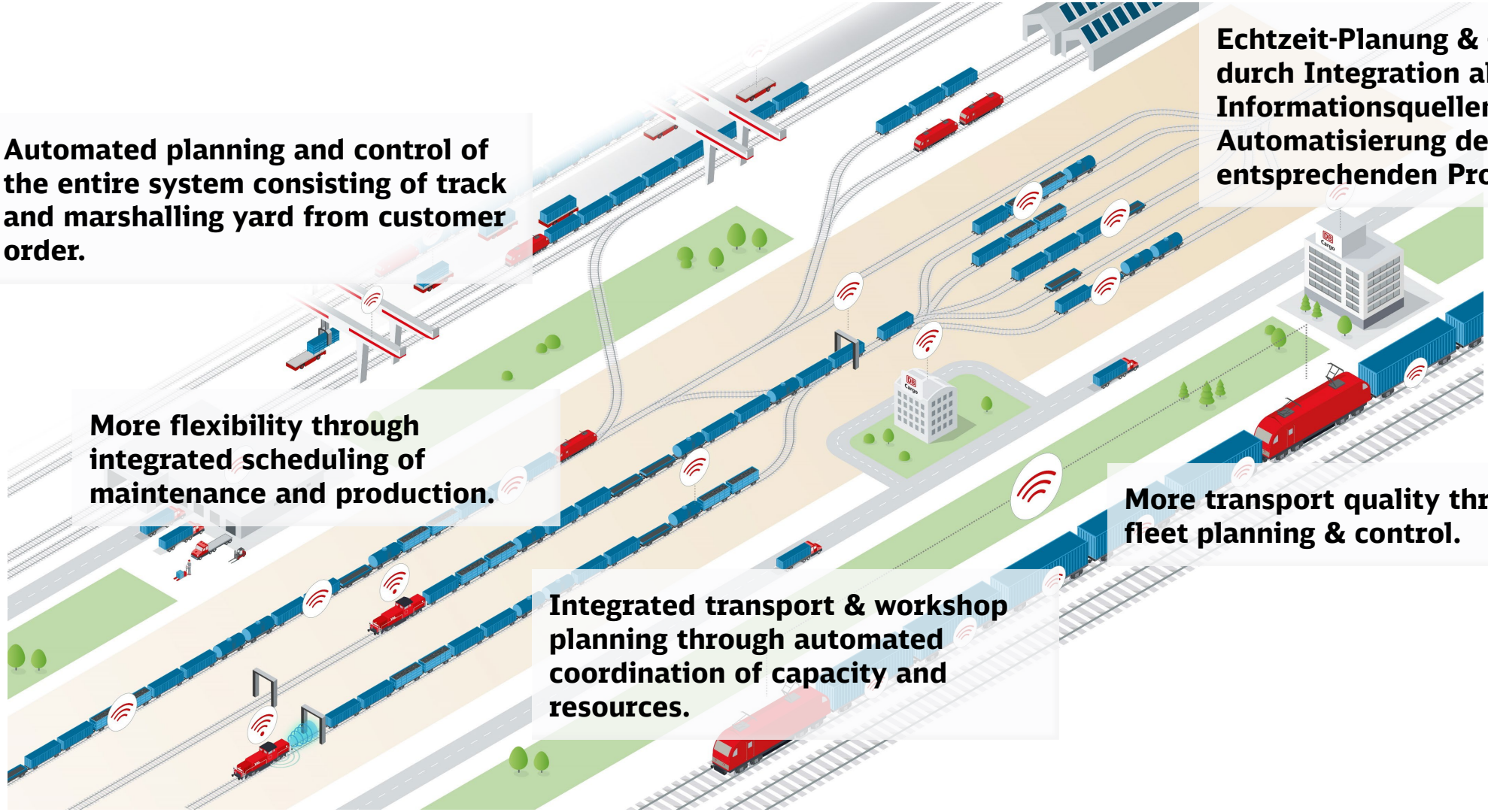

Automated planning and control of the entire system consisting of track and marshalling yard from customer order.

Echtzeit-Planung & -Steuerung durch Integration aller Informationsquellen und Automatisierung der entsprechenden Prozesse.

More flexibility through integrated scheduling of maintenance and production.

More transport quality through fleet planning & control.

Integrated transport & workshop planning through automated coordination of capacity and resources.

7. Smart maintenance | Increased vehicle availability and transparency

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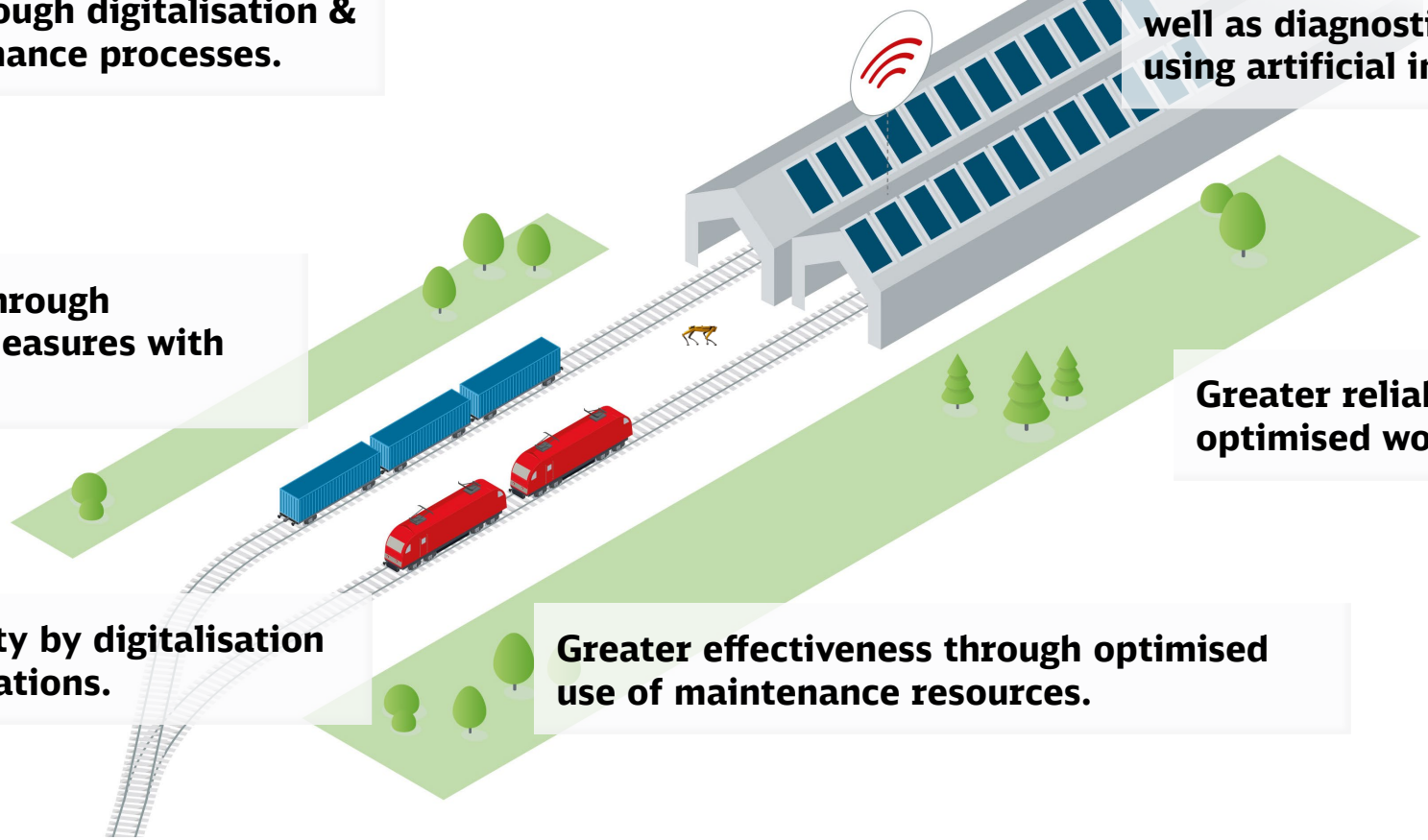
Higher availability through digitalisation & automation of maintenance processes.

Lower maintenance costs thanks to condition-based maintenance as well as diagnostics and forecasting using artificial intelligence (AI).

More robust processes through automatic initiation of measures with self-learning IT system.



Greater reliability thanks to optimised workshop planning.

Higher productivity by digitalisation of rules and regulations.

Greater effectiveness through optimised use of maintenance resources.

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