

# From Digital Twin to Intelligent Maintenance

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Rail Live 2025



Your global  
knowledge-provider

# TYPSA at a Glance

#44 ENR Ranking - International Design Firms

4.000 employees

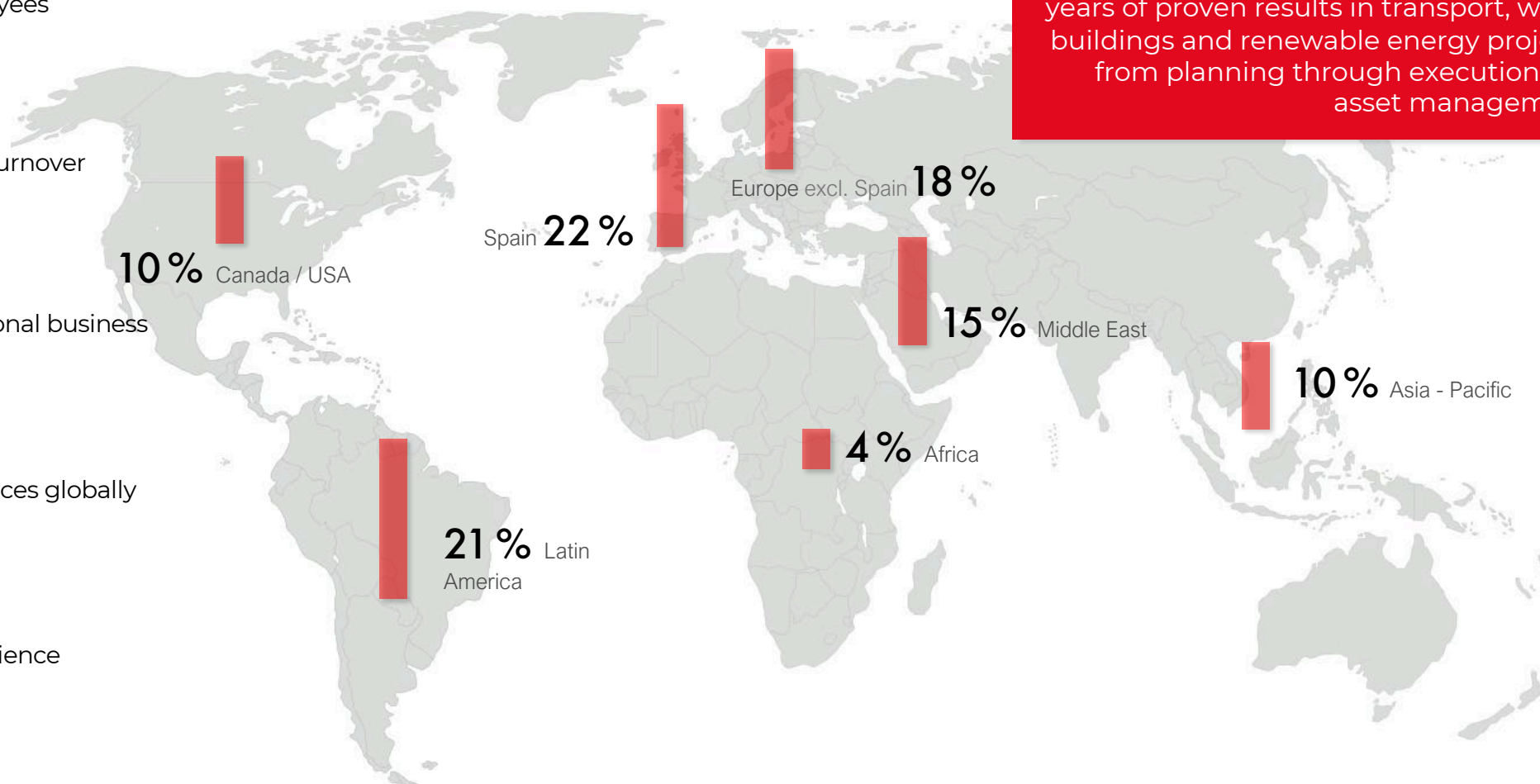
398M € turnover

78% international business

60 permanent offices globally

59 years of experience

TYPSA is an independent consulting and engineering services group with almost 60 years of proven results in transport, water, buildings and renewable energy projects, from planning through execution and asset management.



*\*Figures as of December 2024*



# ■ Consulting, engineering and architectural services

Improving quality of life through the built environment



Transport



Buildings &  
cities



Water &  
Environment



Energy



Rural



# ■ Our **areas of value creation** in knowledge and innovation



## **Value Engineering**

Advanced algorithms in consulting, architecture and engineering



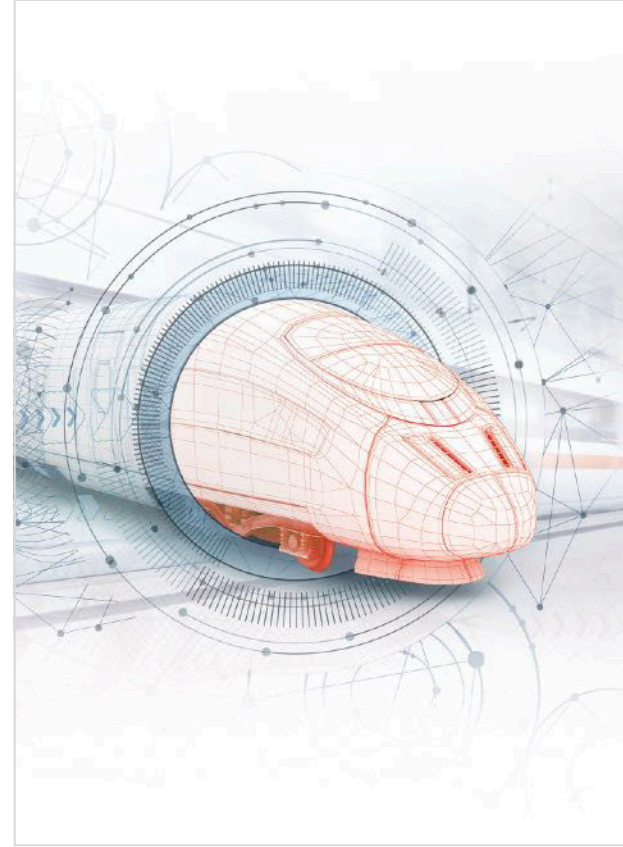
## **Digitalization**

Implementation of new technologies streamlining work



## **Sustainability**

Future-proofing buildings, infrastructures and cities



# ■ Project De-Risking with Digital Twin



## Performance Specifications

- Design parameters.
- Operational requirements.
- Maintenance standards assigned to components.
- Assets of the BIM model.



## Interface Requirements

- Interactions & dependencies between:
  - Civil works
  - ITS / Tolling



## Design & Constr. Standards

- Safety regulations
- Quality assurance protocols integrated into the model for compliance checking.



## Risk Allocation Provisions

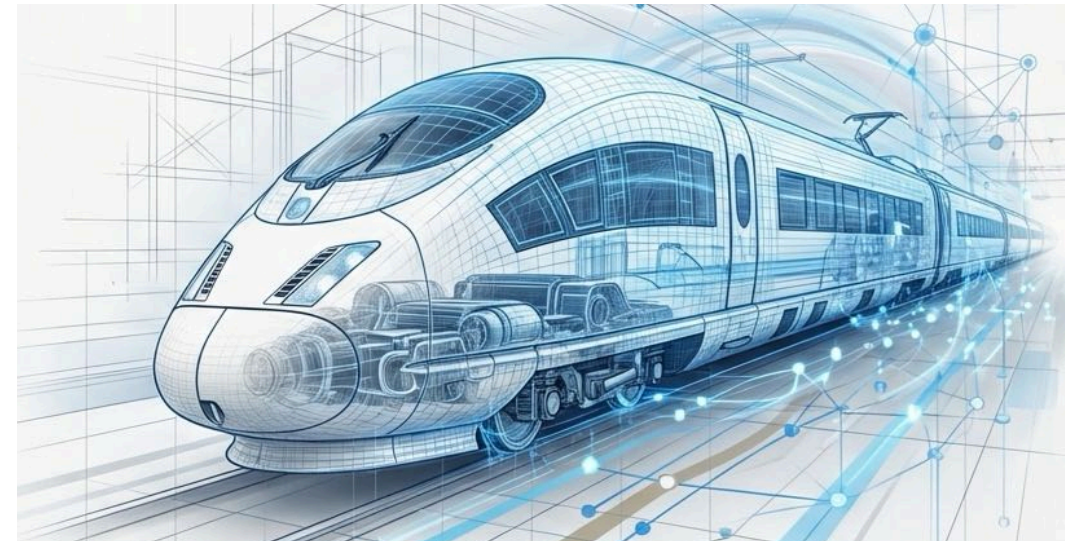
- Delays, cost overruns, and performance failures are allocated to specific elements in the BIM model as a central platform for contract management.



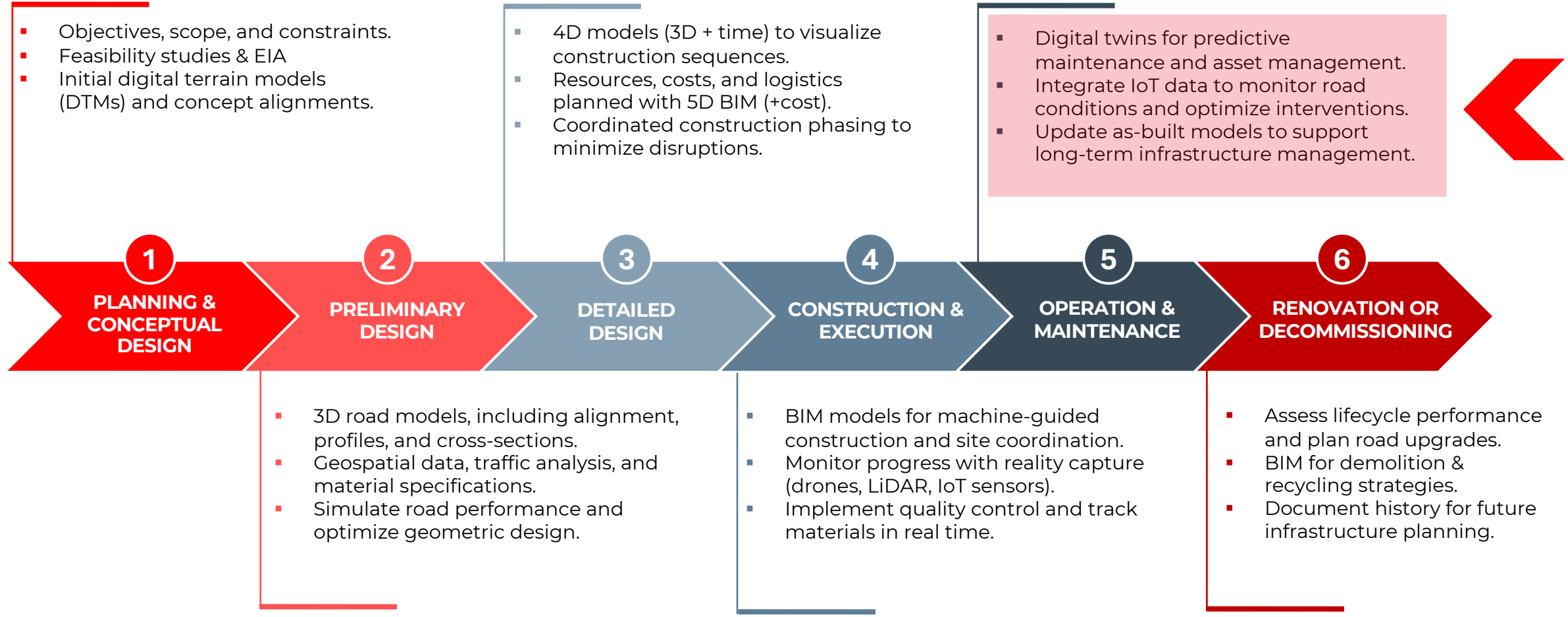
## Asset Management

- Digital twin of the built environment, including as-built information:
  - Maintenance schedules.
  - Operational data.

✓ Digitally-driven de-risking means greater cost and schedule certainty, lower financing costs and more value for money.



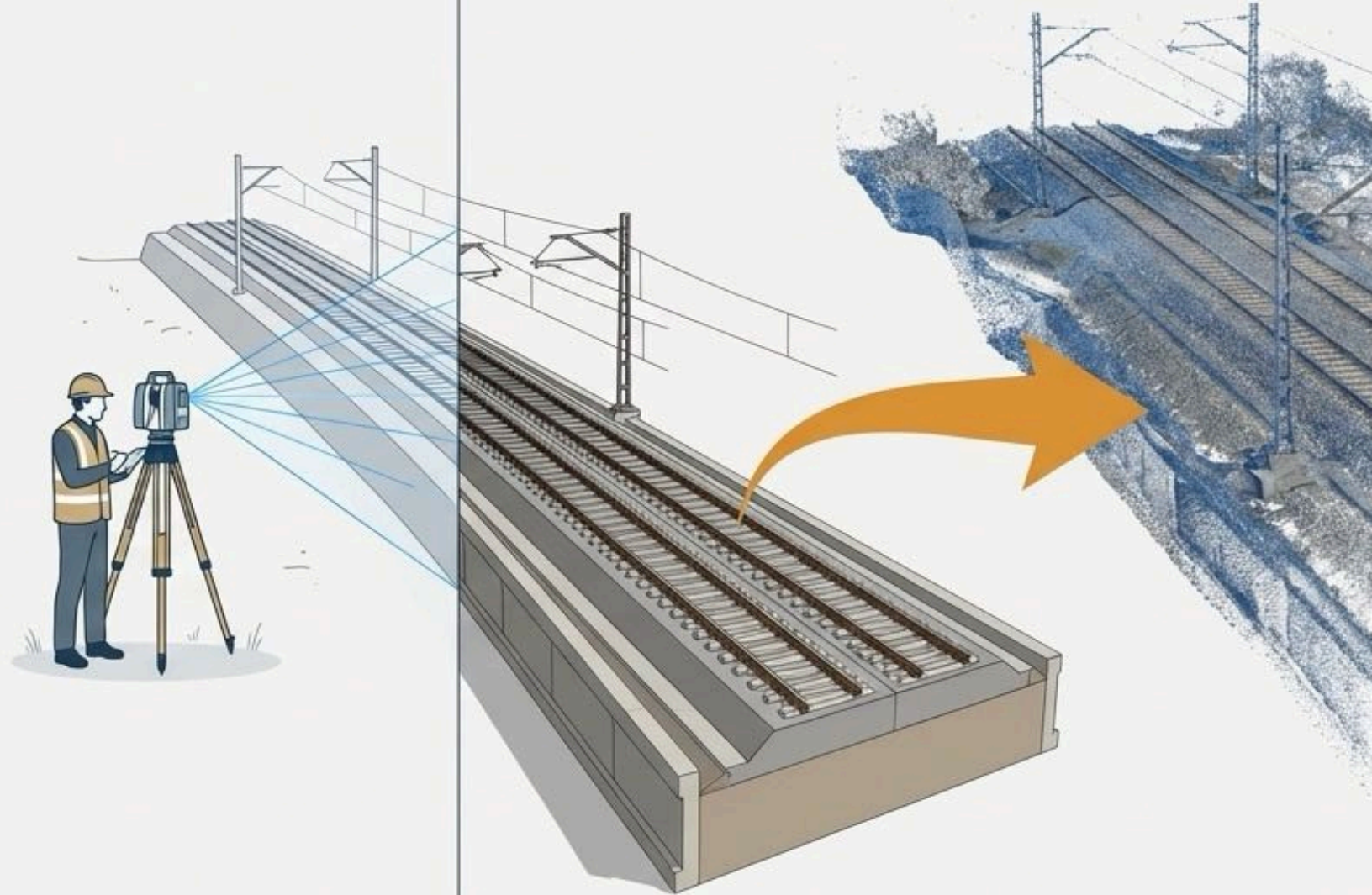
# Digital Twin Life Cycle



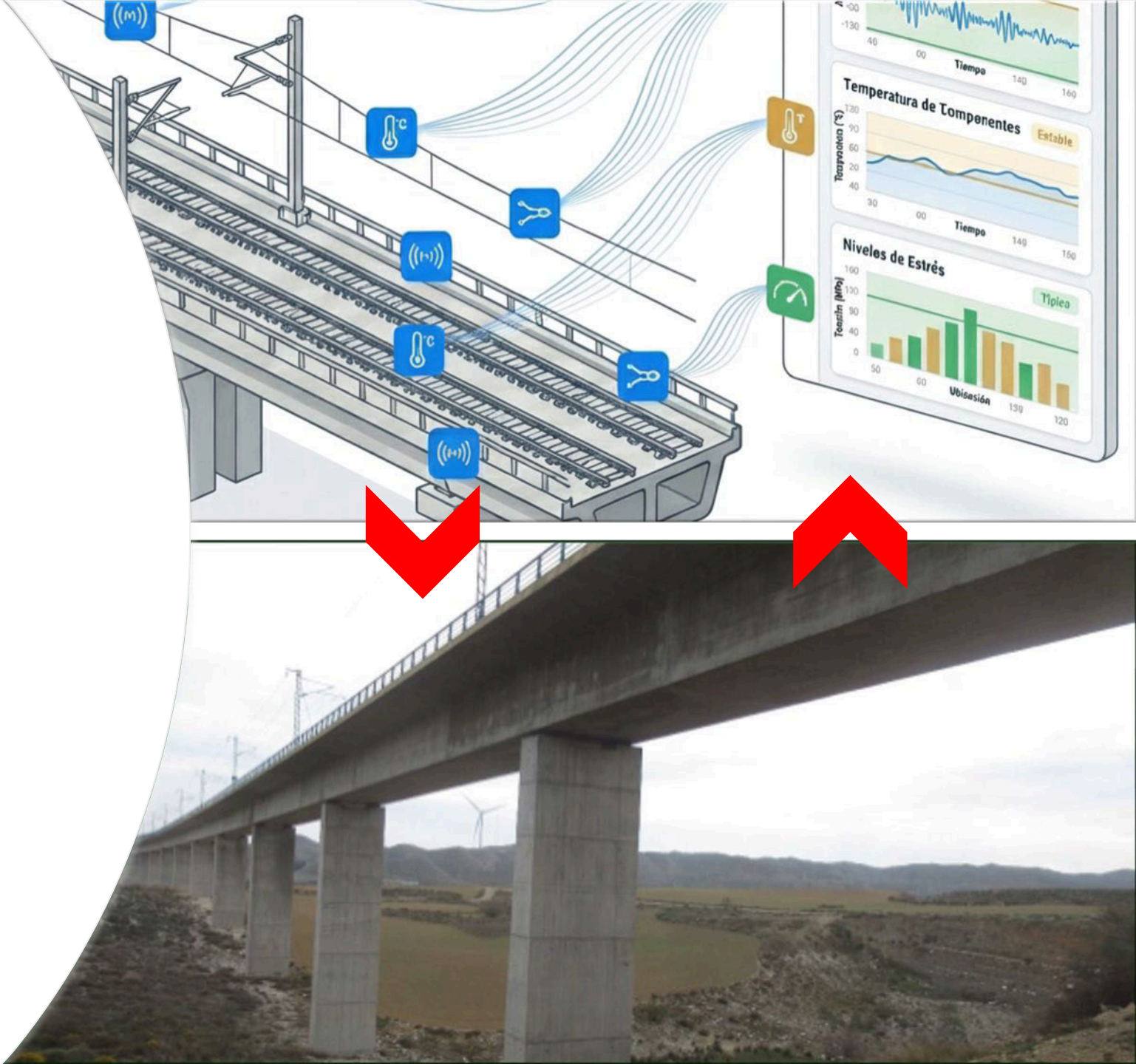
✓ Digital integration at each step enhances efficiency, sustainability, and resilience.



Digital twin is where the physical world and the digital world finally meet



Not a static BIM model, but a dynamic ecosystem that learns from the real asset.



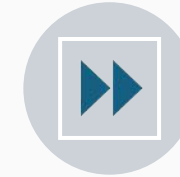




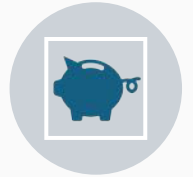
**DISCOVERY:**  
REAL BEHAVIOR  
VS DESIGN  
PREDICTIONS



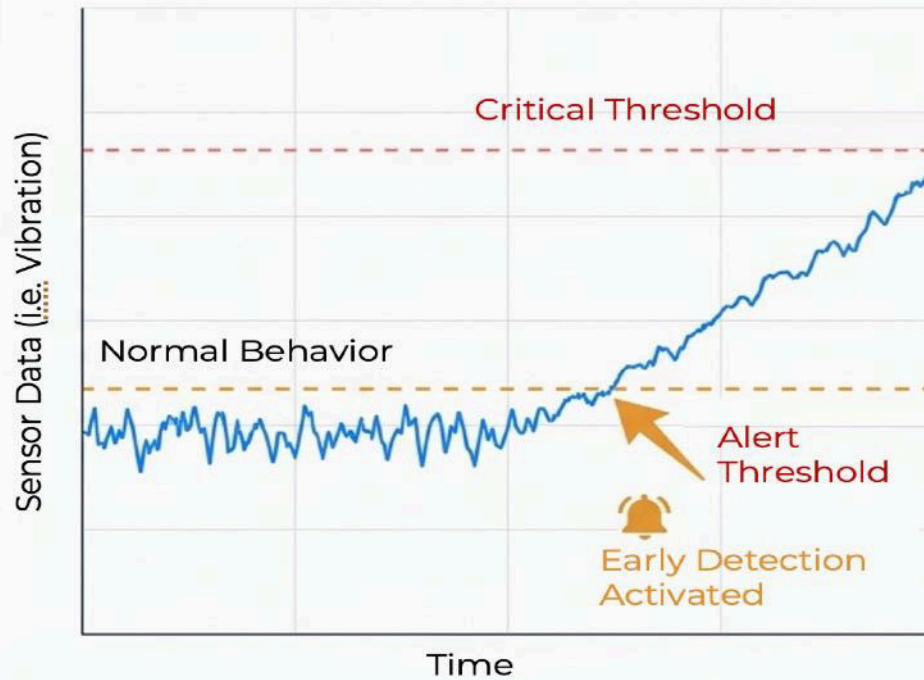
**ADJUSTMENT**  
RECALIBRATE  
WITH REAL DATA



**ACTION:**  
TARGET  
PREVENTIVE  
INTERVENTIONS  
(NOT GENERIC)

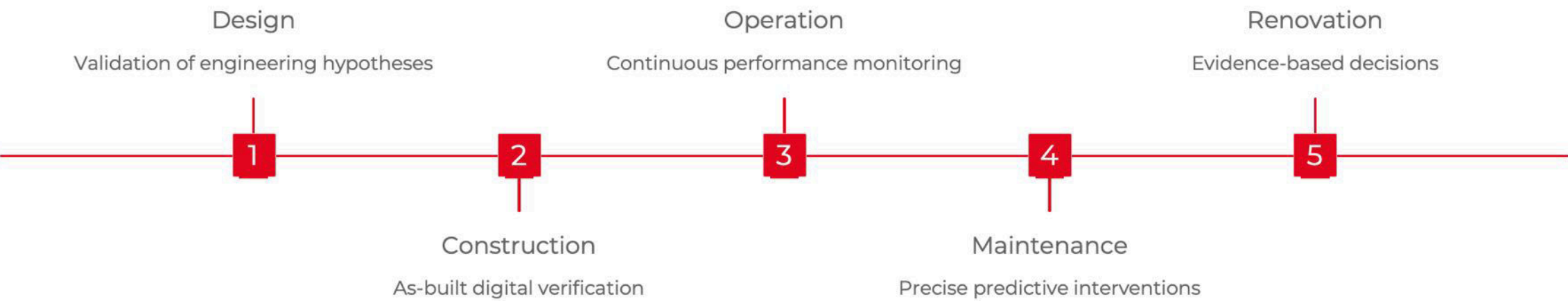


**RESULT**  
REDUCED  
MAINTENANCE  
COSTS +  
EXTENDED  
LIFECYCLE



# From Monitoring to Lifecycle Optimization

The living digital twin transforms the entire value chain of the railway asset.



## Paradigm Shift

From isolated silos (design/operation/maintenance) to an integrated continuum of continuous learning.



The TYPESA logo consists of the word "TYPESA" in white, bold, uppercase letters, centered within a solid red square. The background of the entire slide features a dark blue gradient with a faint, light blue grid pattern and several thin, curved white lines that suggest a global network or orbital paths.

**TYPESA**

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