



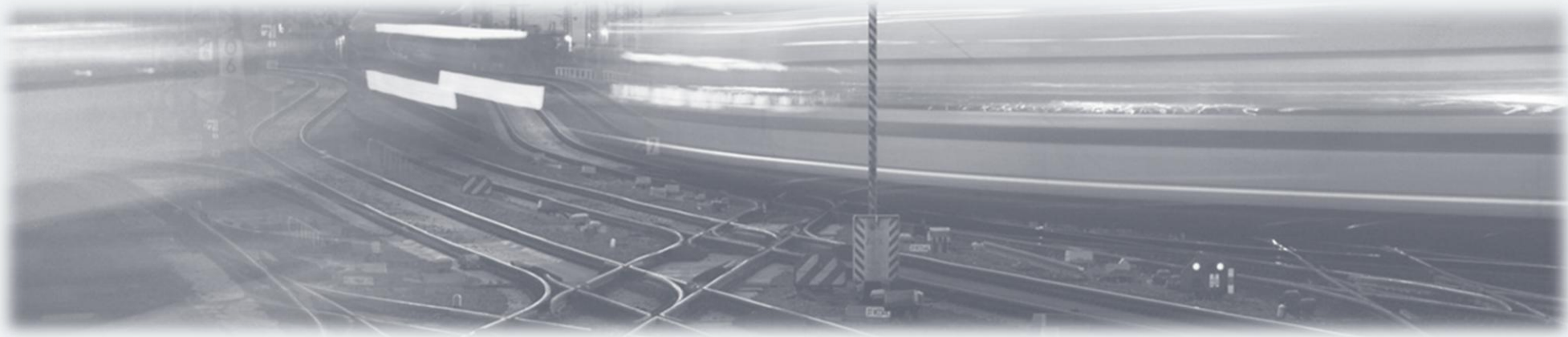
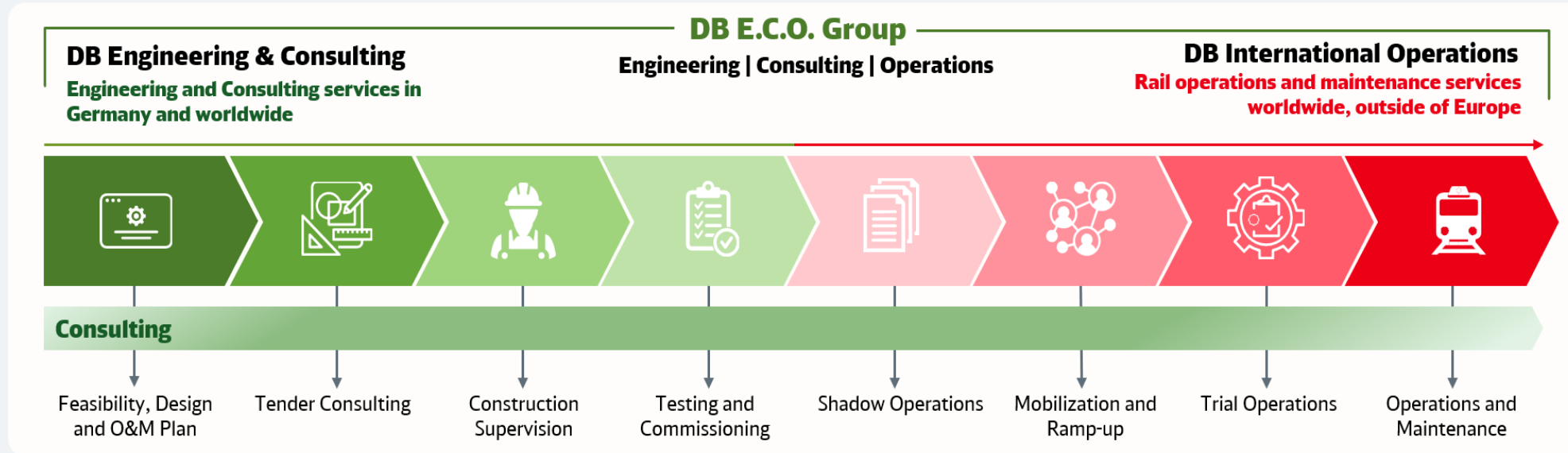
Shadow Operator: *Strategy for the Legacy*

Transport Week 2026

Shadow Operator

Deutsche Bahn / DB E.C.O. Group as your experienced partner

DB E.C.O. Group as a world-wide active engineering and consulting company of DB AG has established itself as a **competence center** for Shadow Operator projects. Being an experienced operator, having inaugurated many railway projects in Germany and worldwide, we maintain an operations-driven, **technology-open approach**. Thus, we see ourselves as a **Thought Leader** for Shadow Operations.



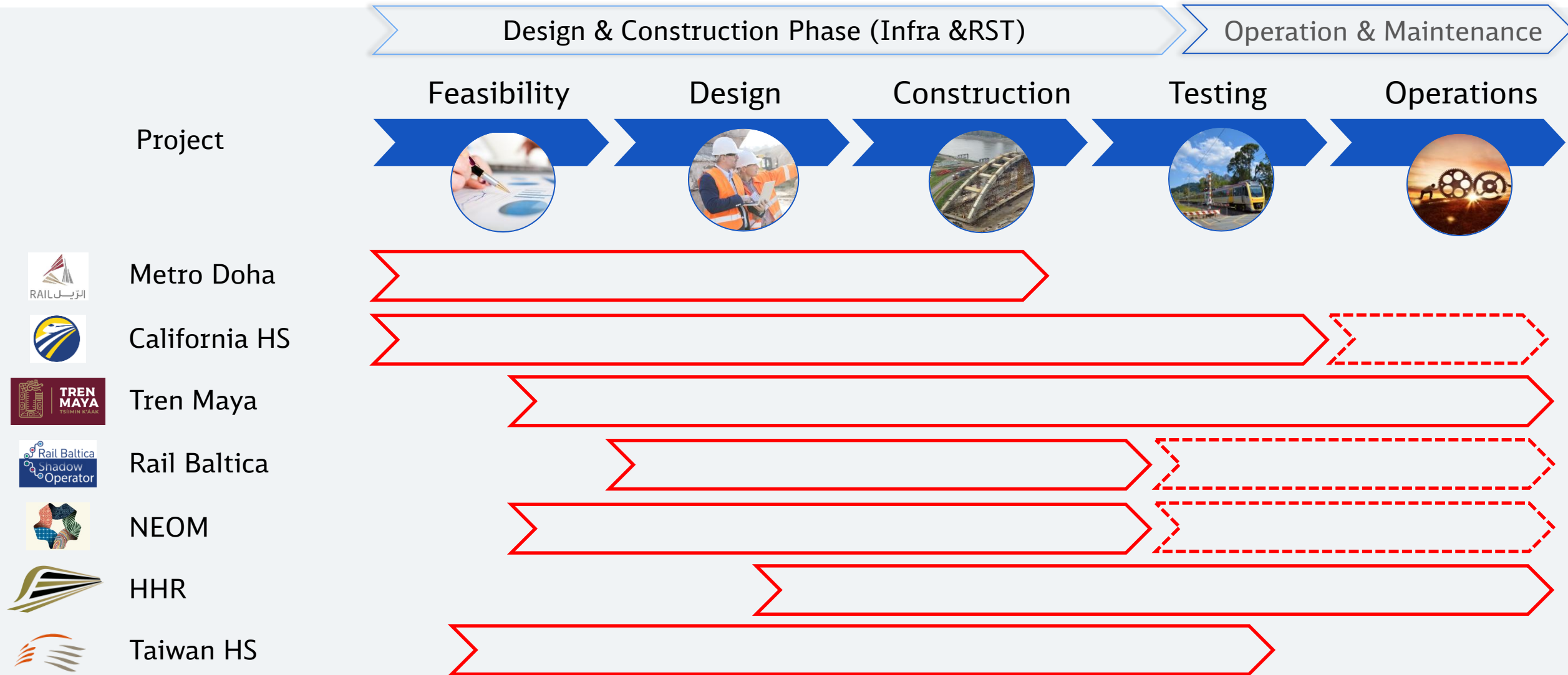
DB E.C.O. Group: our main Shadow Operator projects

Overview of project use cases

	Metro Doha	▶	• Developing and delivering the GoA4 metro of Doha • 76 km track length constructed, > 250km designed incl. long distance
	California Highspeed	▶	• Developing the HSR for California in different stages • 1,250 km track length
	Mexico	▶	• Setting up a passenger / freight rail on Yukatan peninsula • 1,550 km track length
	Rail Baltica	▶	• Setting up the rail link in the three Baltic states (passenger, freight) • 870 km track length
	NEOM	▶	• Setting up the rail-backbone for NEOM (HSR, freight, metro) • 300 km track length
	HHR	▶	• High Speed rail connection between Makkah and Medinah • 450 km track length
	Taiwan Highspeed	▶	• Starting the high-speed network in Taiwan • Initial Banqiao and Zuoying

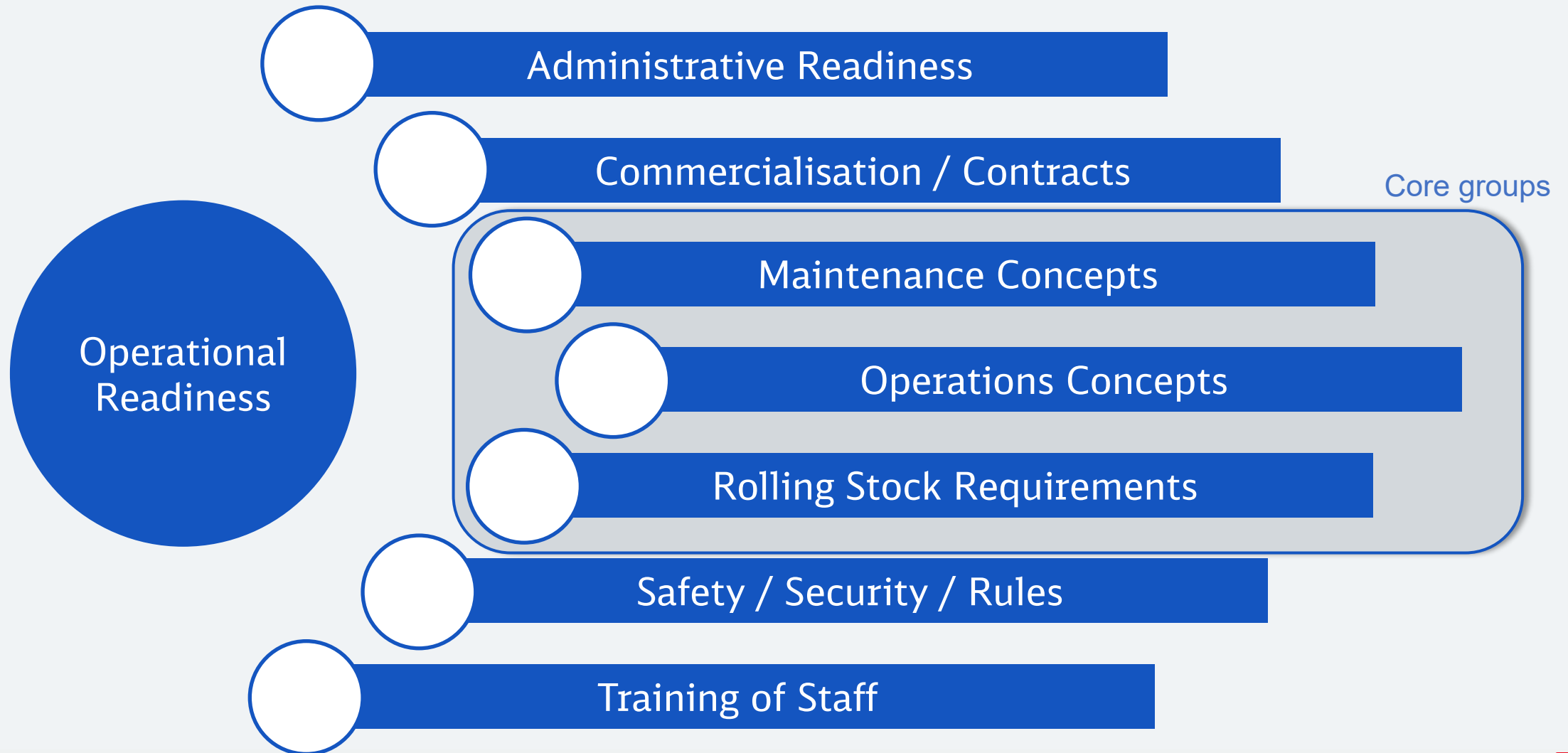
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Matrix collage of project use cases



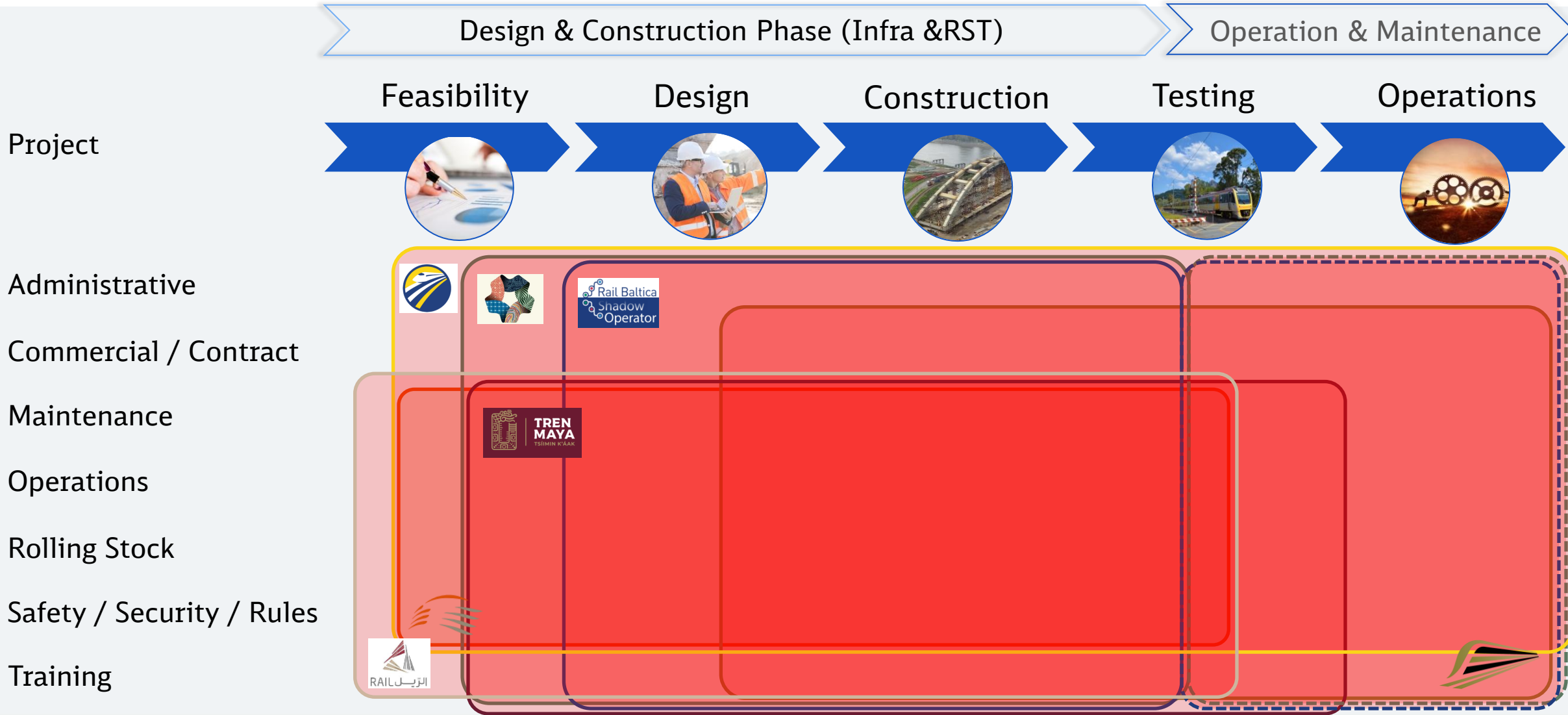
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Operational Readiness, Activity Groups



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Matrix collage of project use cases



DB E.C.O. Group: Shadow Operator use cases

Rail Baltica Global Project



Latvia, Lithuania, Estonia



Client

Rail Baltica AS

Durability

25.10.2022 – ongoing

Activities

Shadow Operator services are combining giving advice on all matters related to Operations, Maintenance, Rolling Stock and beyond. As the operator is not chosen yet, shadow operator is involved in all topics to add the relevant knowledge to the project. The Shadow Operator is seen as a key role reaching Operational Readiness of the project.

Main items being delivered are, inter alia:

- Operations Concept (incl. timetable and circulation plans)
- Maintenance Concept
- Infrastructure and Local Facilities assessment report, and
- Organizational models for both operations and maintenance.

Project Description

Rail Baltica is a greenfield rail transport infrastructure project with a goal to integrate the Baltic States in the European rail network. The project includes five European Union countries – Poland, Lithuania, Latvia, Estonia and indirectly also Finland. Rail Baltica is not just a railway – it is a geopolitical project that will integrate the region more closely with Central and Western Europe. The 870-kilometer railway, built to standard gauge, will allow speeds of up to 249 km/h, making the Baltic states more attractive for trade and tourism.

Shadow Operator @ DB E.C.O. Group

Rail Baltica Global Project

Latvia, Lithuania, Estonia
Finland, Poland
South and West Europe



Design & Construction Phase (Infra &RST)

Operation & Maintenance

Feasibility



Design



Construction



Testing



Operations



Administrative

Commercial / Contract

Maintenance

Operations

Rolling Stock

Safety / Security / Rules

Training



- Operations Plan, timetable, train paths
- Standard operations plans and procedures
- Maintenance concept and organization,
- Local Facilities,
- Logistic business cases,
- Rolling Stock requirements,
- Yellow Fleet requirements,
- Safety Management System,
- Security Strategy,
- Training of Safety critical personnel,
- Operational Rules and Procedures
- Tbc.

Optional, next phases

- Strategy for Railway undertakings
- Third party access
- Commercialisation
- System acceptance
- Trial operations
- Test programme
- Operations supervision
- Tbc.

Contact



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DB E.C.O. Group: Shadow Operator use cases

Ghana Western Line

Ghana



Client . Republic of Ghana

Strategic partner Afreximbank

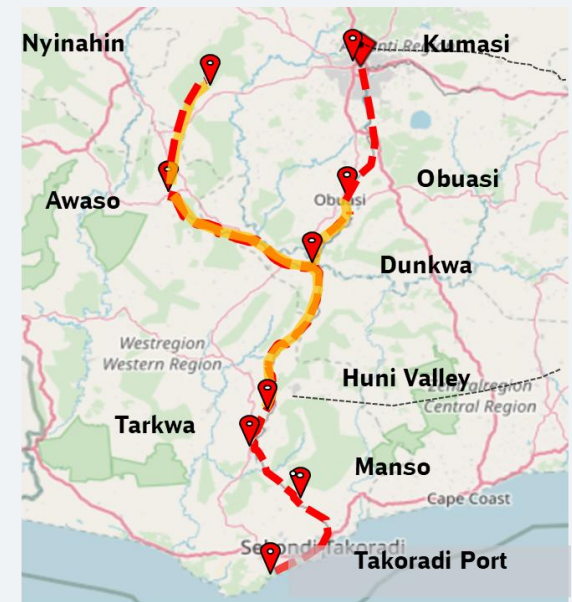
Durability . 2020 – 2021 (on hold, but ongoing)

Activities Early Project Development: **from Operator to Operator:**

- Freight Demand,
 - Feasibility Study including technical and operational requirements
 - Risk Assessment
 - Business Case / Bankability.
- Including
- Proposed concession model,
 - Main project timeline

Project Description

Develop and Build the Western Railway Line from Obuasi to Huni Valley & Branch line from Nyinahin - Awaso to Dunkwa on Offen, and to Operate and Transfer a profitable, integrated railway corridor and system to the Republic of Ghana



DB E.C.O. Group: Shadow Operator use cases

Al Haramain high speed rail (Makkah – Madinah)

Saudi Arabia



Client	Saudi Railways Organization (SRO) Kingdom of Saudi Arabia
Durability	2012 - ongoing
Activities	▪ Design review for railway systems ▪ Supervision of construction (rail systems, track) ▪ Supervision of rolling stock procurement (35 Spanish Talgo train-sets) ▪ Interface Management ▪ Accompanying trial operations ▪ Preparation of operations ▪ Monitoring of operation during first year 2018 ▪ Started 2024: Shadow Operations of existing operator
Project Description	A new high-speed passenger railway connects the Holy Cities of Makkah and Madinah. The electrified double track has a total length of 450 km and is designed for a commercial speed of 320-360 kph. There are five stations including one at the international airport in Jeddah. For Shadow Operator topics, the Rolling Stock supervision and the operations supervision are important. We are proud that SRO has chosen us in 2024 to again oversee the operations of the railway

DB E.C.O. Group: Shadow Operator use cases

NEOM Shadow Operator

Saudi Arabia



NEOM

Client

Neom Mobility

Durability

2023 – ongoing

Activities

Shadow Operations Services for:

- High-speed passenger,
- Regional passenger, and
- Freight

Including

- Systems requirements,
- Operations and Maintenance support during design and construction,
- Systems validation,
- Trial operations, and
- Initial operations supervision.

Project Description

NEOM Project is a global destination in the northwest of the Kingdom of Saudi Arabia, built to be a center for innovation and a different model for sustainable living, following the principles of the new future for cognitive societies that preserve the environment and uplift both people and places.

Mobility: There are no conventional vehicles or roads, as NEOM is establishing a sustainable and integrated transportation system based on autonomous means. NEOM aims to be the world's first region with zero carbon emissions, operating on 100 percent renewable energy.

DB E.C.O. Group: Shadow Operator use cases

Metro / Long Distance Qatar

Qatar

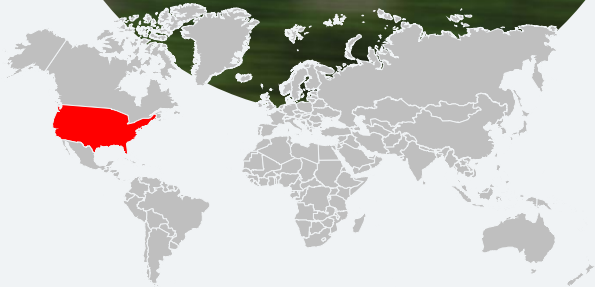


Client	Qatar Rail
Durability	2007 – ongoing / March 2015 – May 2016 Shadow Operator
Activities	■ Development of O&M policies, strategies and SOPPs ■ Development of an overall Operation Plan ■ Development of an overall Maintenance Plan ■ Design review from O&M perspective to ensure that the system design is consistent and that all subsystems and components fit in the overall maintenance strategy ■ O&M support in development of tender documents for civil & systems, rolling stock to ensure that operation and maintenance issues are considered ■ Participation in tender evaluation process ■ Development of the O&M end-state operators contracts documentation ■ Definition of roles and responsibilities of the O&M end-state operator
Project Description	Qatar Rail is developing the passenger and freight railway network within the State of Qatar that will be a link in the proposed Gulf Cooperation Council (GCC) railway network. Phase 1 is approximately 151 km long and comprises a rail link from KSA to Doha including an Intermodal Freight Yard and an international passenger station.

DB E.C.O. Group: Shadow Operator use cases

California High Speed Railway – Early Train Operator

California, USA

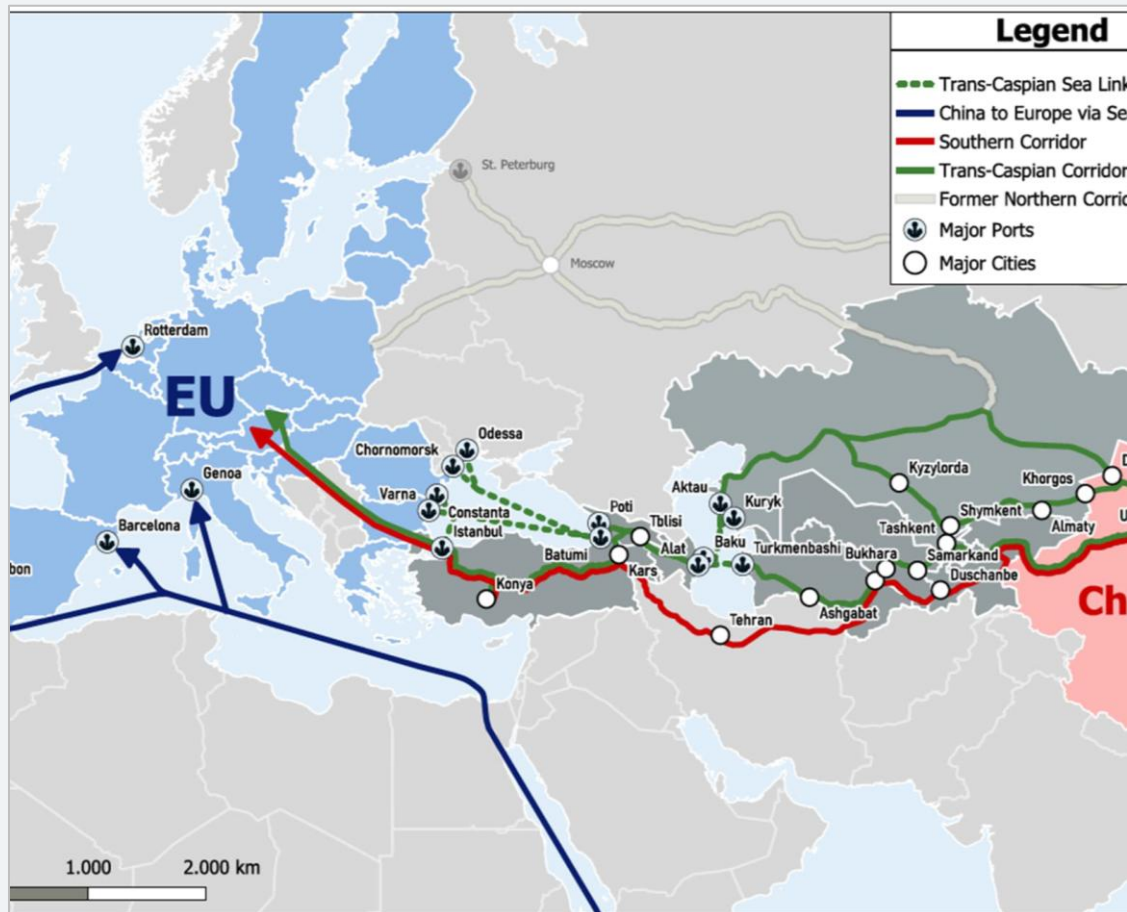


Client	California High-Speed Authority
Durability	December 2017 - ongoing
Activities	▪ Procurements relevant to revenue operations and ancillary revenue opportunities ▪ Optimization of whole life, capital and life cycle costs associated with Rolling Stock, Track and Systems and Stations ▪ Station design and operations ▪ Rolling Stock fleet size and design and interior layout ▪ Fare integration and inter-operability between transportation operators connecting with or to the System ▪ Security and safety arrangements for the System ▪ Operations control systems including dispatching responsibilities ▪ Service planning and scheduling for both the System and connecting buses that the Authority expects will be run by the Contractor ▪ Opportunities to maximize System revenues, including ancillary revenue opportunities ▪ Ridership and passenger revenue forecasting ▪ Operations and maintenance (O&M) cost forecasting ▪ Marketing and branding strategy for the system ▪ Risk management including risk registers in the Authority Risk Management System

DB E.C.O. Group: Shadow Operator use cases

Chance: Trans Caspian Transport Corridor

Central Asia



Client

European Union

Durability

(if successful) Start 2025

Activities

Advance the sustainable development of seamless transport connections between Europe and Central Asia and within the Trans-Caspian Transport Corridor.

- Transit Time Reduction
- Infrastructure development - Infrastructure Investment Mobilisation
- Policy and regulatory alignment
- Logistics Performance Index Improvement

Project Description

The Trans-Caspian Transport Corridor serves as a critical link between Europe and Asia, offering an efficient, sustainable, and safer route with a targeted transit time of no more than 15 days. The TCTC region faces significant challenges requiring a coordinated response.

DB E.C.O. Group: Shadow Operator use cases

Tren Maya - Mexico

Mexico



Client	FONDO NACIONAL DE FOMENTO AL TURISMO (FONATUR) (Mexico)
Durability	01.10.2020 – 31.05.2024
Activities	- Phase 1: Review the conceptualization in the development of the Basic Engineering for the provision of passenger and freight rail transport services - Phase 2a: Accompany and advise the client, through the revision and/or drafting of technical annexes for the tendering of contracts, - Phase 2b: Accompany FONATUR during the bidding process or developers' contracts, specifically during meetings or declarations, adjustments to technical annexes and during the period of evaluation of proposals, providing technical advice on railway operation. - Phase 3: Supervise and monitor the manufacturing process, supply and installation of Rolling Stock and Railway Systems - Phase 4: Advise and support FONATUR during the period of testing, commissioning and commercial service of passenger rail transport,
Project Description	Since 2019, the Federal Government of Mexico strengthened efforts in various priority projects related to transport and communication in the country, one of them being the construction of the Tren Maya (Mayan Train) located in the southeast of the country. Most of the study territory comprising the states of Yucatan, Quintana Roo, Campeche and Chiapas lacks railway infrastructure. .

DB E.C.O. Group: Shadow Operator use cases

Taiwan High Speed Rail Project

Taiwan



Client Taiwan High Speed Rail Corporation

Durability 2001 – Jun 2013

Activities Ongoing experts support throughout all phases of Taiwan High Speed Rail Construction, Testing, Training and Operation provided by Railway Expertise, e.g.:

- Trackwork and Civil Support
- Core System Support for System Engineering and Signalling
- Operations Support
 - Training
 - Provision of Train Controllers and Train Drivers
 - Safety Management
 - Auditing
 - Maintenance Management

Project Description In the middle of the 1990s the planning and design phase of the Taiwan High Speed Rail project took place. The goal of the project was to build up a high-speed rail connection for the taiwanese Western Corridor. In March 2000 THSRC began the construction of the high-speed rail project. In the same year the contract with the Taiwan Shinkansen Consortium was closed. In January 2007 THSRC started operating the rail line between Banqiao and Zuoying with 38 train services a day.