

Achieving an
**innovative,
sustainable
and interoperable
Rail Network**

Middle East
RAIL
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A few words about me....



- Civil Engineer (MSc.) - University of Hannover in Germany
- Master Executive MBA degree - Athens University of Economics & Business
- Over 30 years of experience in the railway sector, including eight years in Director positions at Greek Railways Organization
- 2006 - 2013 the Head of the Railway Systems Directorate
- 2013, 2014 development of the Omani National Railway Network
- Senior Railway Expert at the Ministry of Transport and Communications in Oman
- On 14/2/2019 launched website www.railhow.com, aiming to be the touchstone for people who are working within the engineering sector by offering practical, yet impactful knowledge and learning experiences.

What is my presentation about...

- Provide
 - ideas
 - best practices
 - suggestions

for

An innovative, sustainable
and interoperable
Rail Network,
focused in the GCC region



...let's start...



(I assume) we all agree that

- the railway industry should be **efficient**
- railway service levels and quality should **respond to market demands** while maintaining affordability for the public budget;
- rail services should maintain national—or/and international—**safety and environmental standards**



so it is challenging to develop efficient railway networks that are

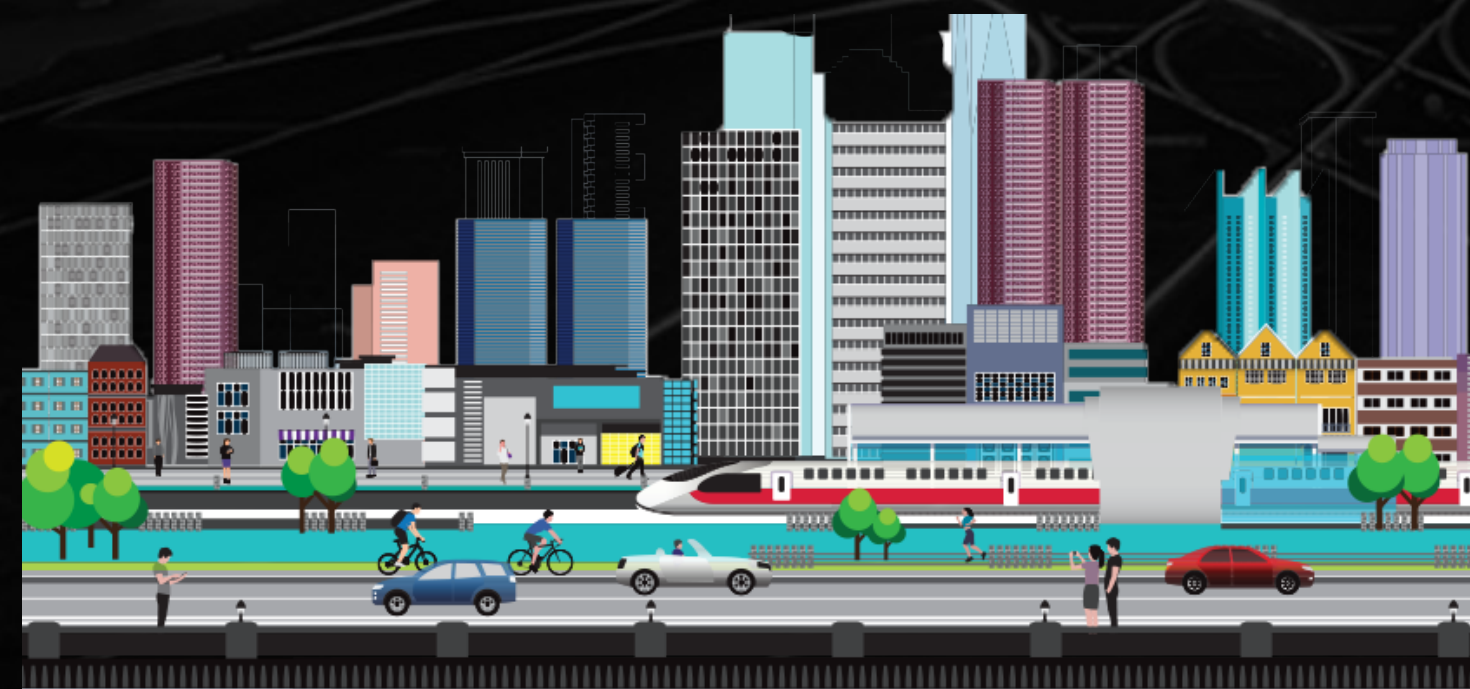
- Innovative
- Sustainable and
- Interoperable

1. Innovative:

- **Incorporate innovative solutions** in the design, construction and management of the railway infrastructure
- **Provide innovative solutions** to the Train Operating Companies (Railway Undertakings)

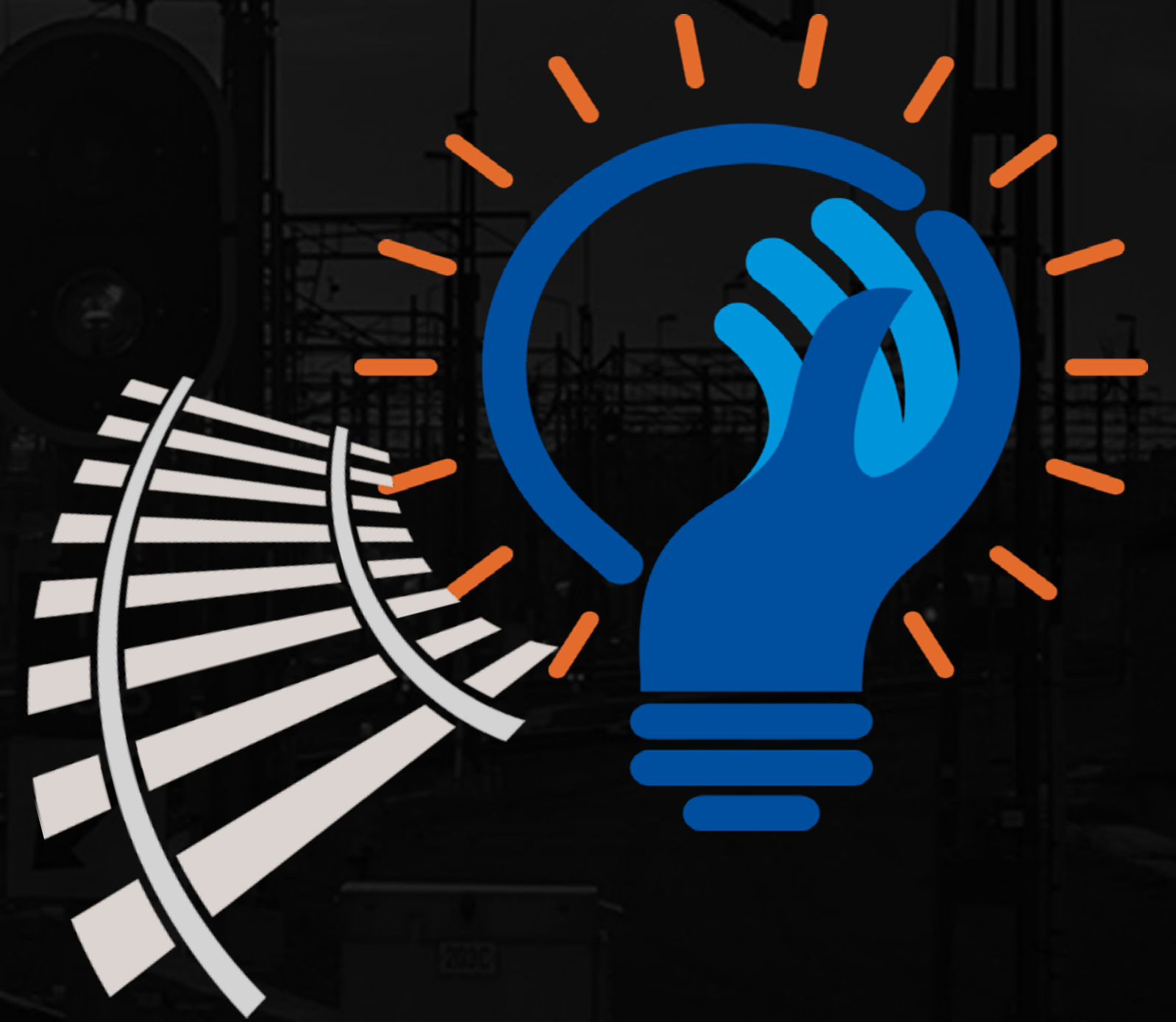
2. Sustainable: consider the **long-term consequences of short-term activities**

3. Interoperable: national networks to be **part of a broader picture**



1. Applying Innovative solutions

Incorporate innovative solutions in the design, construction and management of the railway infrastructure



Shift2Rail

- Shift2Rail is a **European rail initiative**
 - Focused on **research and innovation (R&I)** and **market-driven solutions**
 - by accelerating the **integration of new and advanced technologies into innovative rail product solutions.**



<https://shift2rail.org/>



New and advanced technologies



Innovative rail product solutions



100%



The initiative aims to
Double the capacity of the European rail system

New and advanced technologies



Innovative rail product solutions



50%



Increase the reliability and service quality by 50 %
of the European rail system

New and advanced technologies



Innovative rail product solutions



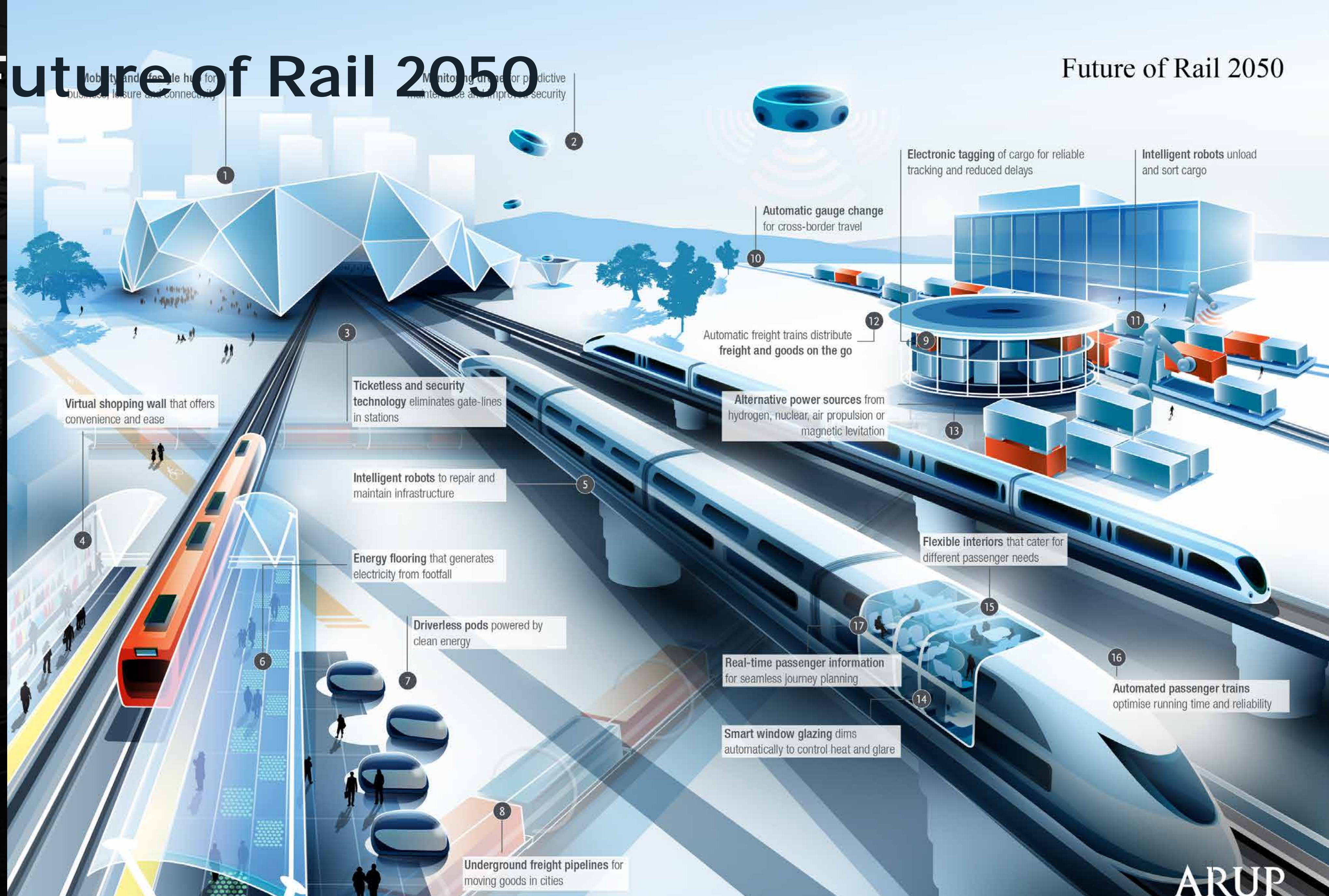
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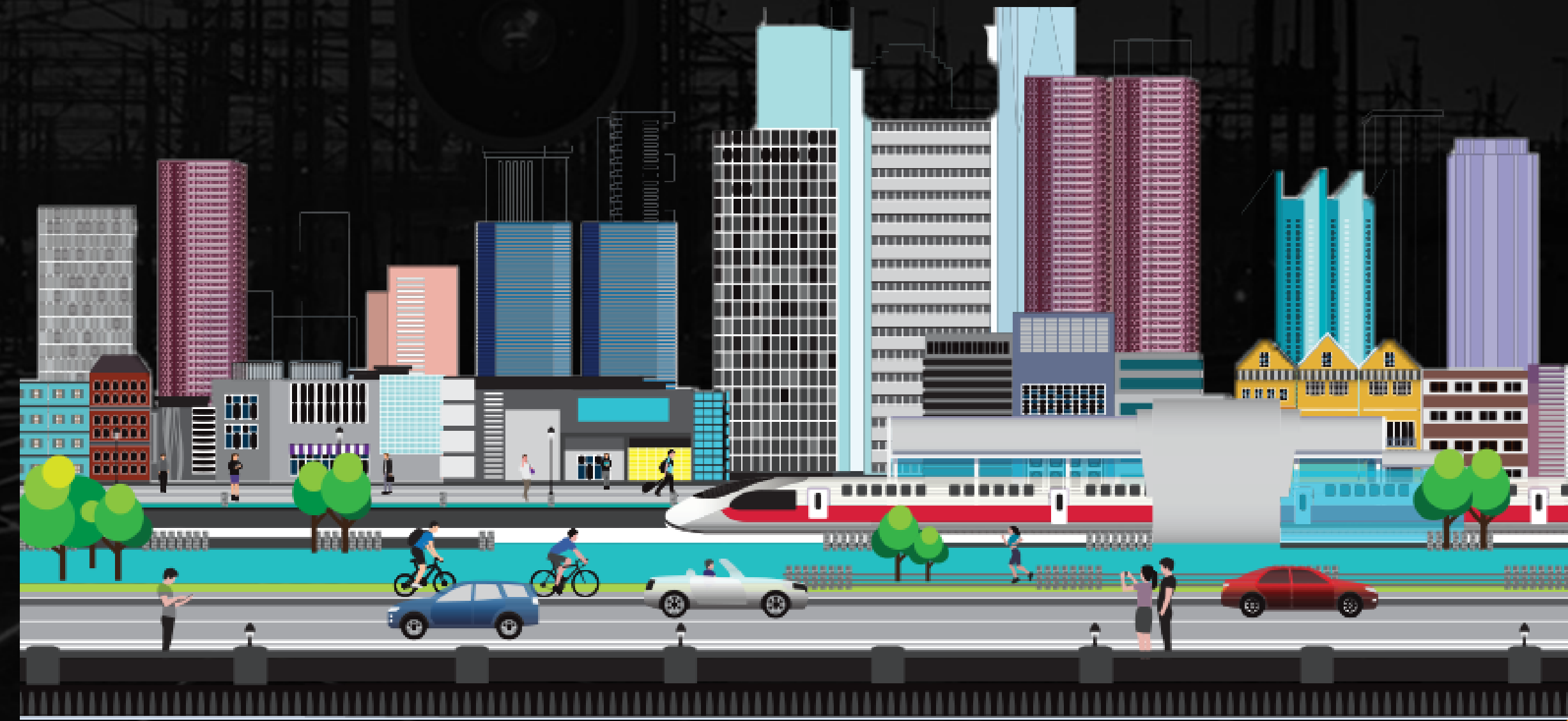
Halving life-cycle costs of the European rail system

Study: Future of Rail 2050

Future of Rail 2050



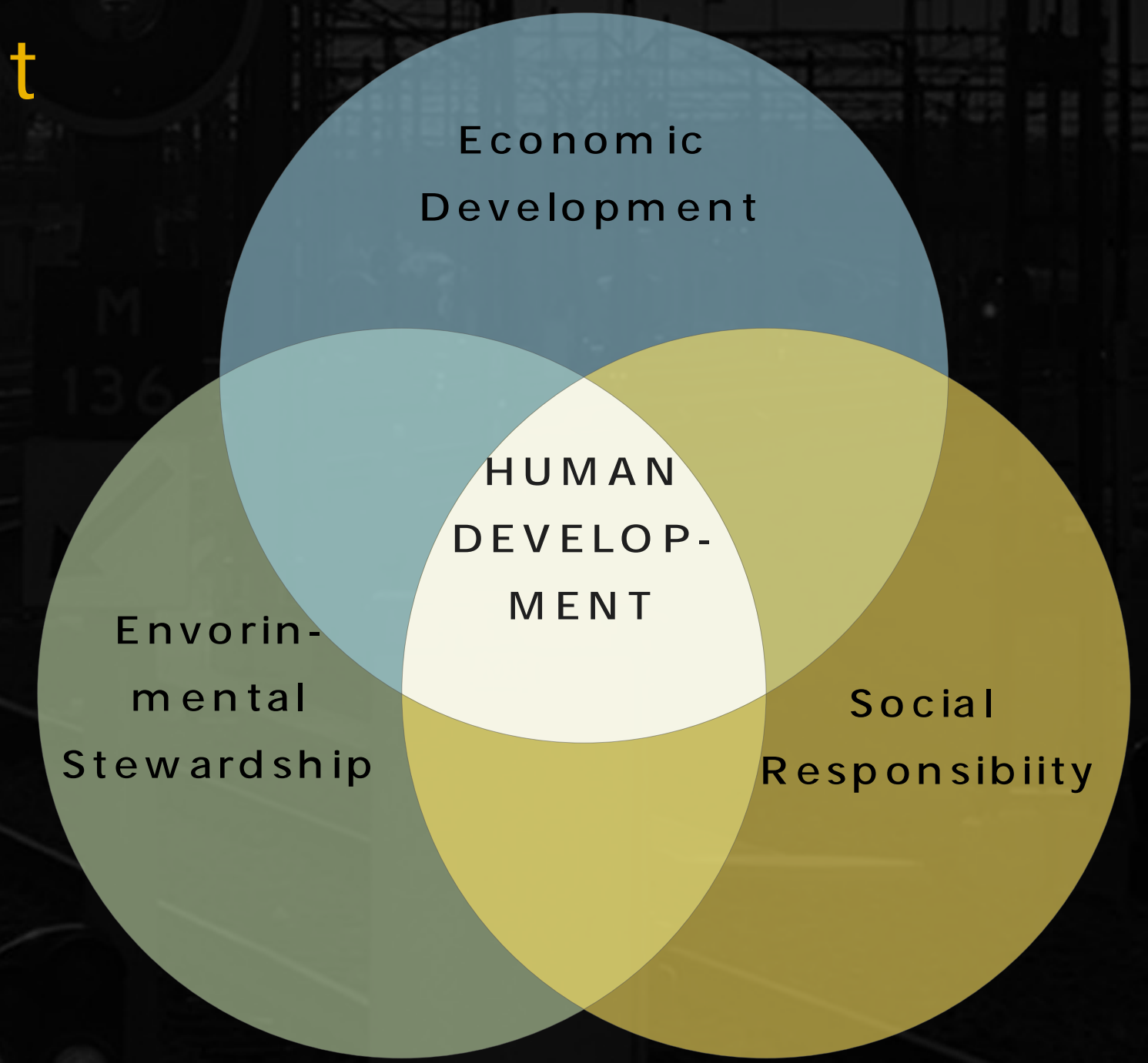
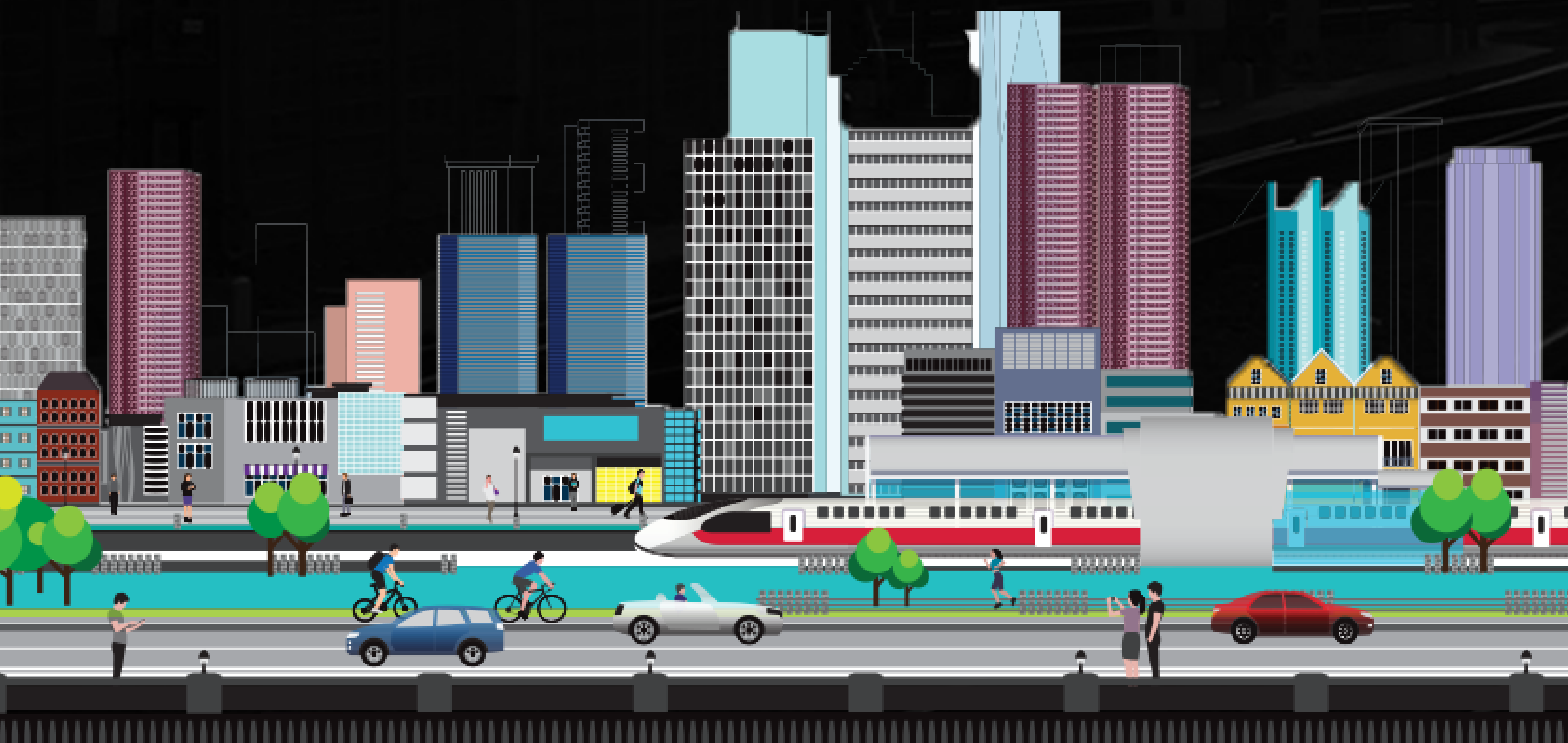
2. Sustainability



Consider the long-term consequences of short-term activities

What is sustainability?

- There are many definitions:
 - meeting human development goals while at the same time sustaining the ability of natural systems to provide the natural resources and ecosystem services upon which the economy and society depend.
 - **The development that meets the needs of the present without compromising the ability of future generations.**





*.....the development that meets the needs of the present
without compromising the ability of future generations....*

Global warming and the greenhouse effect

CO₂ emissions and Transport

- The transport sector is a key source of air pollution
- Is responsible for 30% of total CO₂ emissions in Europe
- The CO₂ emissions are now 25% higher compared to 1990



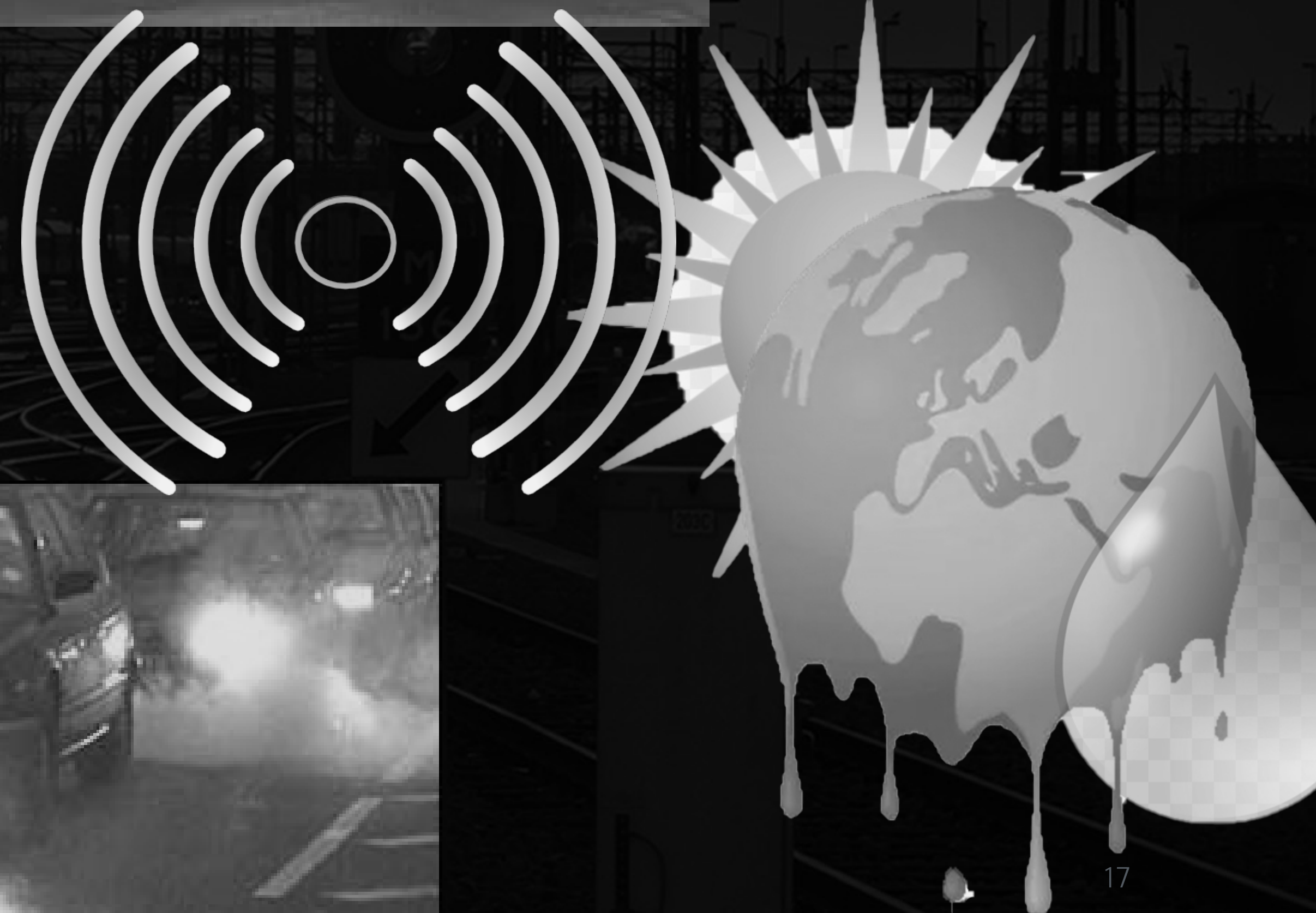


The external cost of transport

What is included in the external cost of transport?

Main factors for the external costs of transport:

- Accidents
- Congestion
- Environmental pollution
- Noise
- Climate change

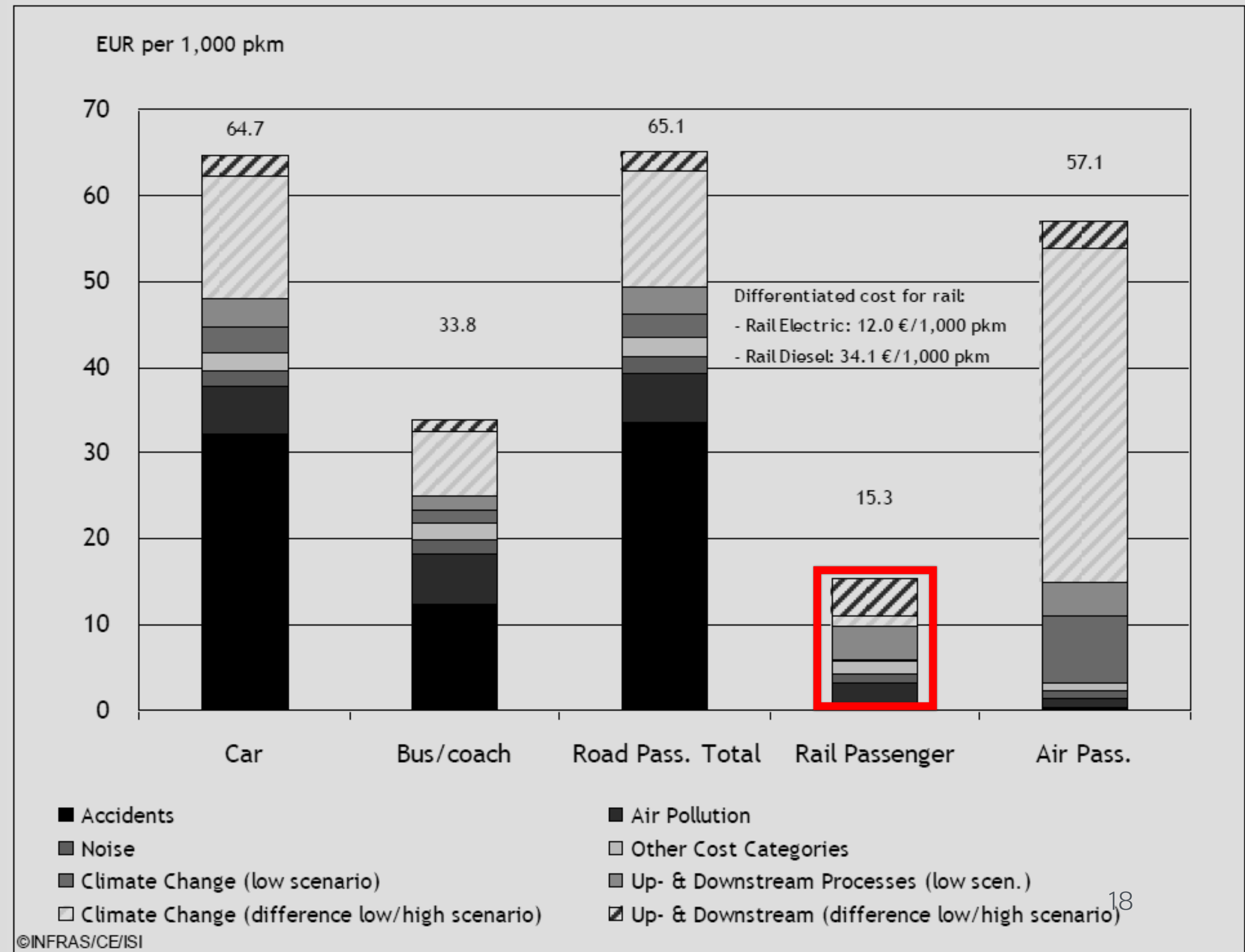


Average external costs for EU-27: **passenger transport** (excluding congestion)



Source: *External Costs of Transport in Europe, Update Study for 2008, 09/2011*

<https://www.cedelft.eu/en/publications/download/1301>

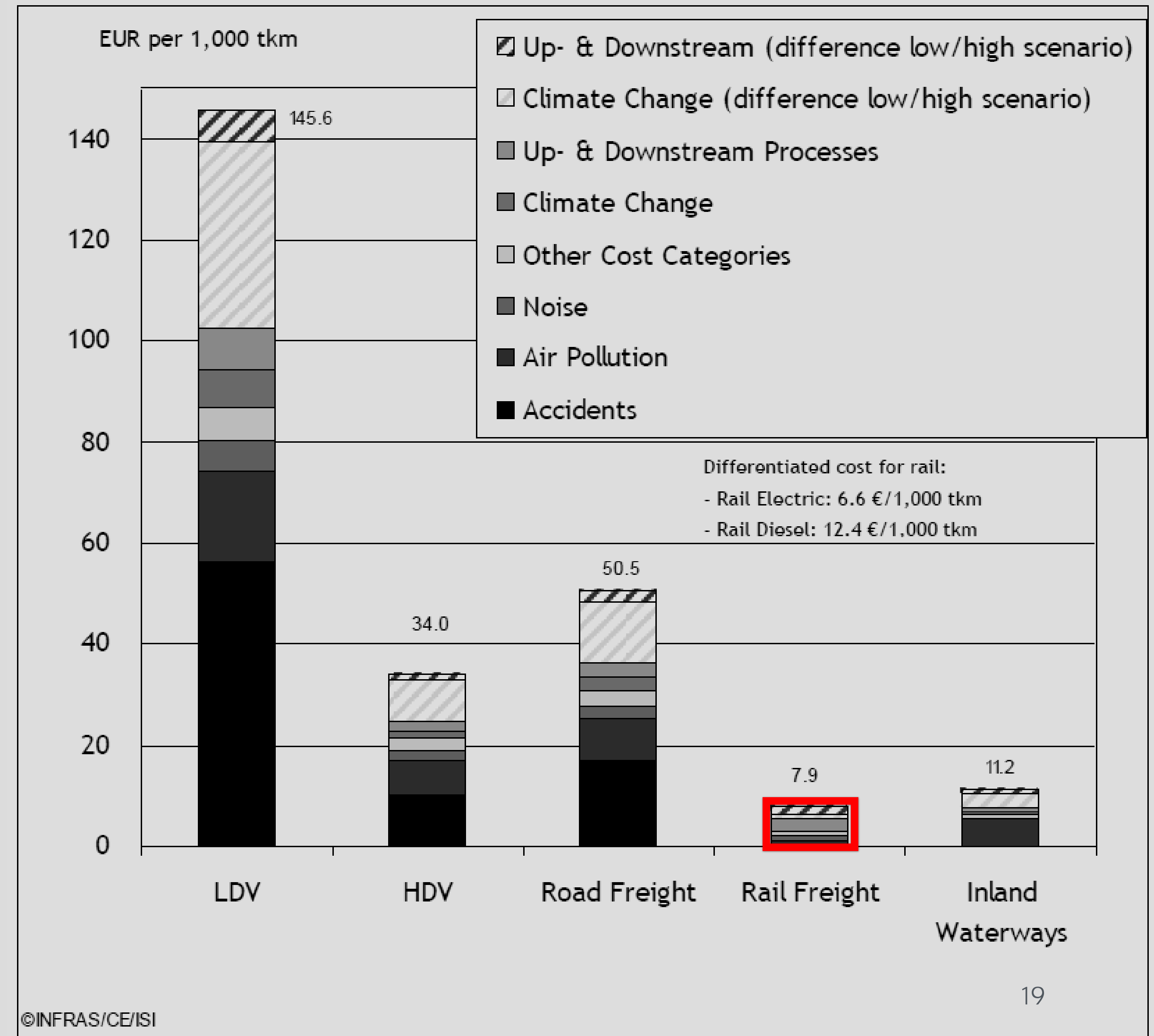


Congestion costs are not included in this graph

Average external costs for EU-27: freight transport (excluding congestion)



LDV: Light duty vehicles (up to 3.5 ton gross weight)
MC



...we behave as if we
had four planets
earth...





The rail sector has strong advantages when considering the wider social and environmental impacts of different transport modes.

The development of railway networks can **meet the needs of the present without compromising the ability of future generations.**

3. Removing Barriers: INTEROPERABILITY

Our challenge is to build a rail system to
fit for the future



Railway development in the GCC countries

- Currently, the Middle East region is the part of the world with the most ambitious railway projects



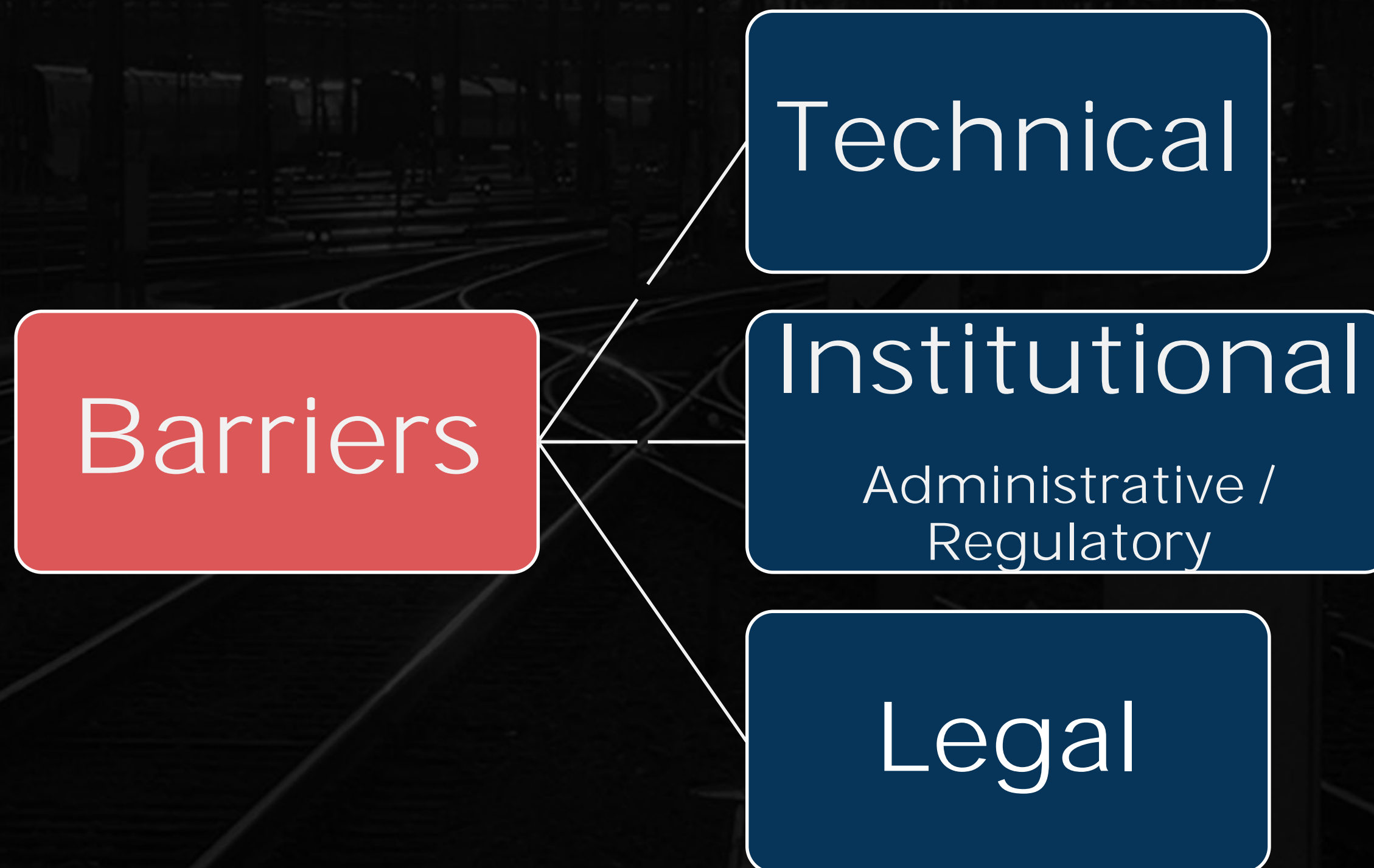
- There is an imperative need to use
 - common standards
 - common rules for operations and
 - common legal/institutional systems



Barriers to cross-border rail transport

Barriers

- affect efficiency of the transport system
- decrease attractiveness for passengers and freight
- financial impact



Travelling / moving goods from Kuwait to Oman

6 Countries

7 borders



Barriers to cross-border rail transport

Barriers

- affect efficiency of the transport system
- decrease attractiveness for passengers and freight
- financial impact



How can we remove the barriers?



Removing barriers:
The challenges for the railway
development in the GCC

The Creation of an efficient Railway System in GCC

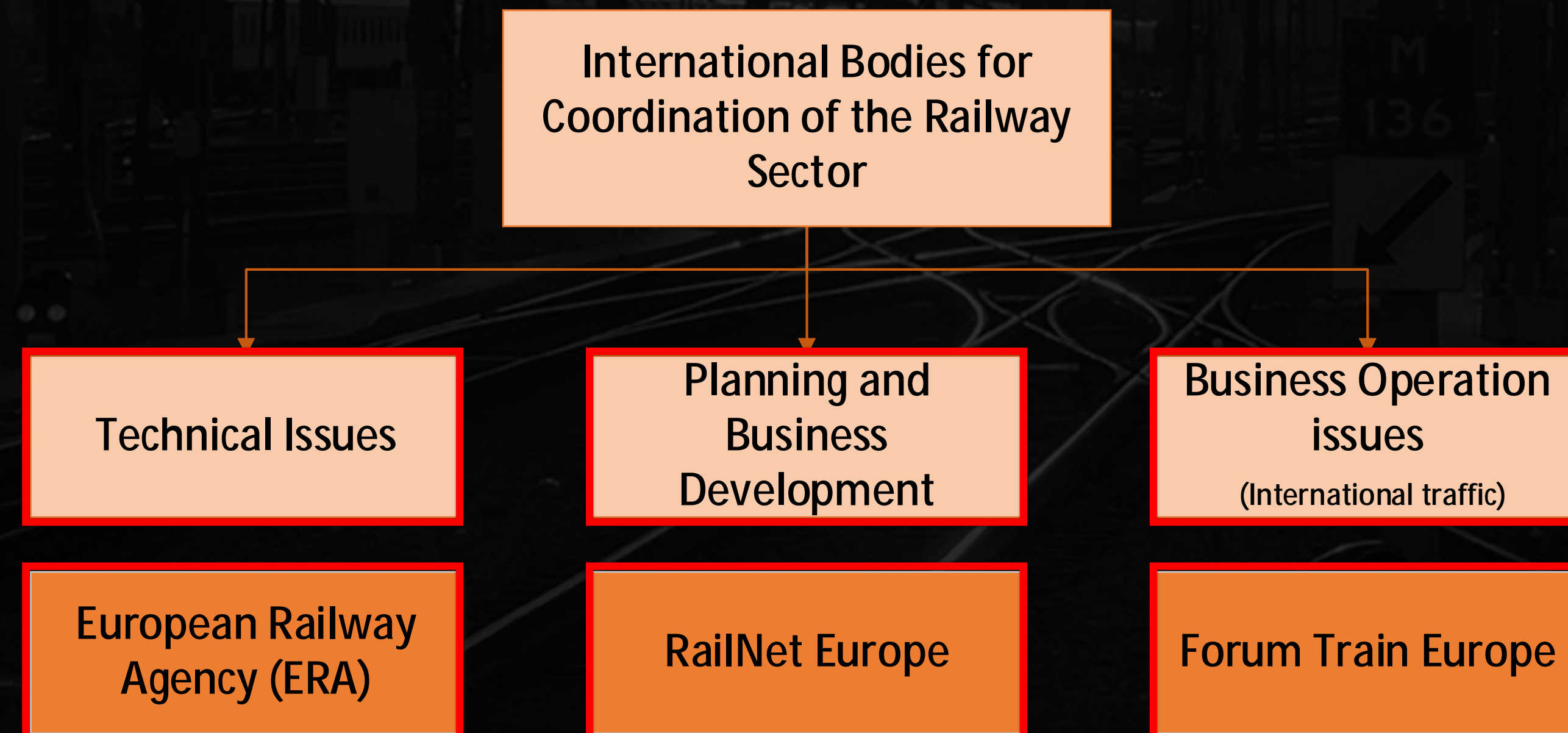
The key to success: Coordination of activities!



European experience: International Bodies for Coordination of the Railway Sector



- In Europe there are International Bodies for Coordination of the Railway Sector, covering following fields:
 - **Technical issues**
 - **Planning and Business Development issues**
 - **Business Operation issues** (Regional –International- traffic)



The European Union Agency for Railways (ERA)

- Its mandate is the **creation of a competitive European railway area**, by
 - **increasing cross-border compatibility** of national systems, and
 - ensuring the **required level of safety** by developing a common approach to safety on the European railway system.
- The ERA **sets standards for European railways in the form of Technical Specifications for Interoperability**



EUROPEAN
UNION
AGENCY
FOR RAILWAYS

RailNet Europe – international co-operation between **Infrastructure Managers**

- The main objective of RailNet Europe is to **develop and improve the international railway business**.
- To achieve this, RNE focuses on the entire rail infrastructure production process; this includes
 - harmonising the members' **medium and long-term planning**
 - **timetabling**
 -



Forum Train Europe (FTE)

- FTE is a European association of **Railway Undertakings and Service Companies** based in Berne (Switzerland)
- FTE promotes **cross-border coordination** amongst Railway Undertakings.
- As a coordination body for railway undertakings, FTE provides its members a **coordination platform for the international harmonisation of timetable**

www.forumtraineurope.eu

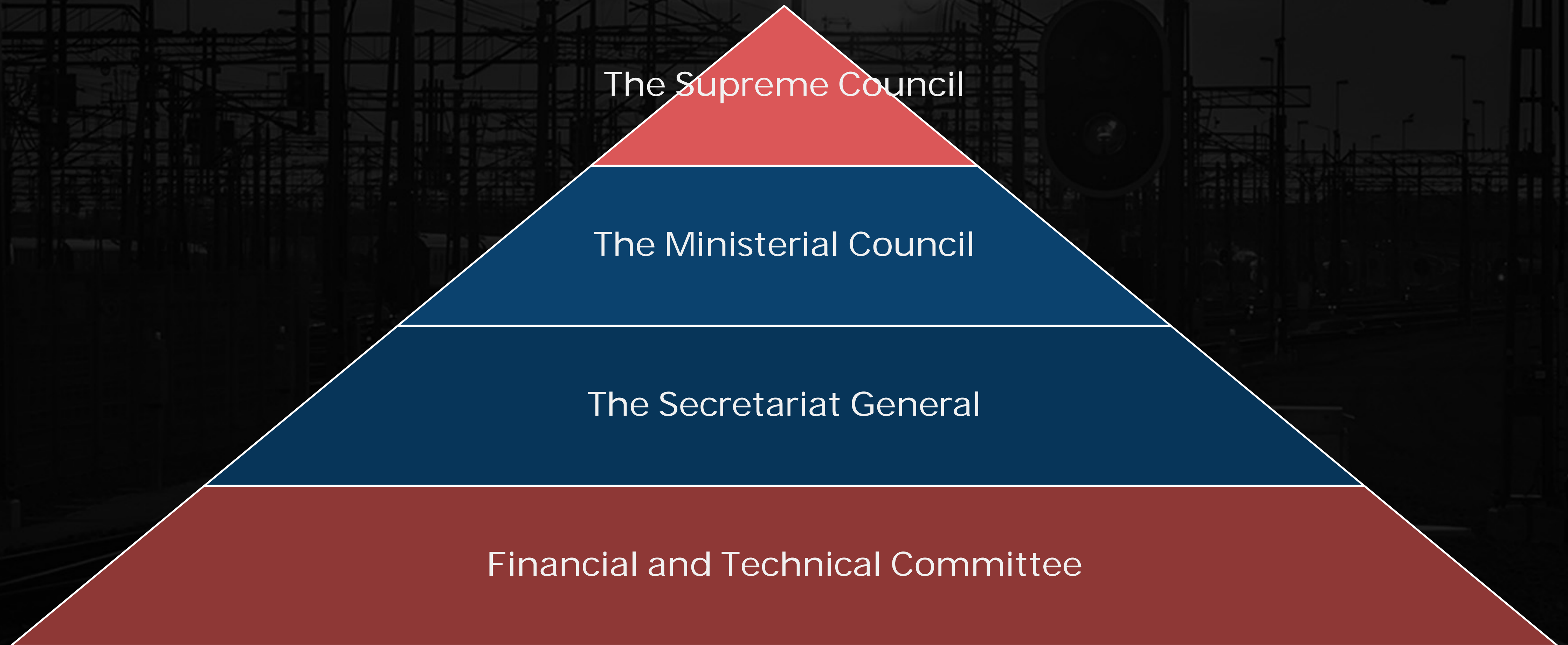
PLANNING TRAINS TO CONNECT EUROPE

Removing barriers:
Recommendations
for coordination of activities in the GCC

The Creation of an efficient Railway System in GCC



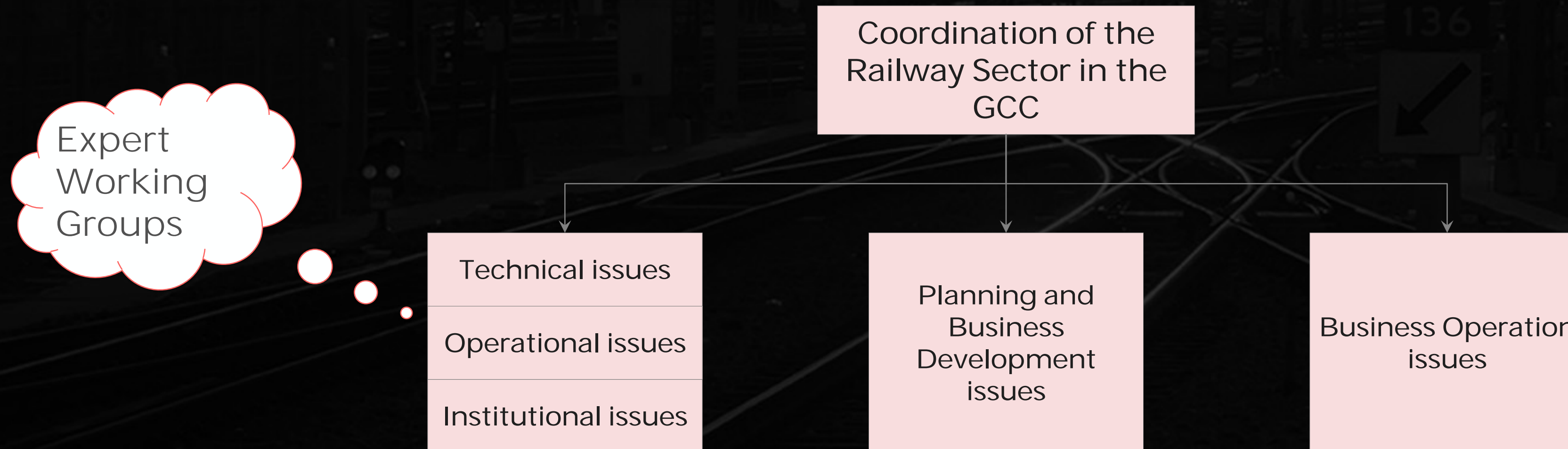
The Organizational Structure of the Cooperation Council for the Arab States of the Gulf



Recommendations for coordination of activities in the GCC

The objectives of coordination of the railway development for GCC, could cover following fields (indicative):

1. Technical, Operational, Institutional issues
2. Planning and Business Development issues
3. Business Operation issues (Regional –International- traffic)

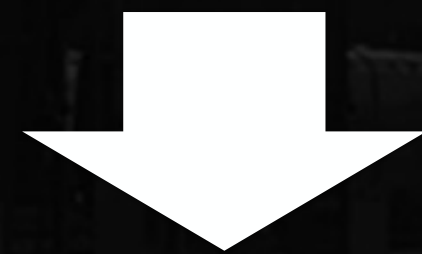


Technical, Operational, Institutional issues



Challenge:

- **Creation of a competitive railway area in GCC**, by
 - **Removing technical barriers** (increasing cross-border compatibility of national systems)
 - **ensuring the required level of safety**



Outputs:

- **Common Guidelines** ("Technical Specifications for Interoperability"), covering all sectors of the railway system
- **Common technical standards**
- **Development of a common approach to safety** on the GCC railway system

Planning and Business Development issues



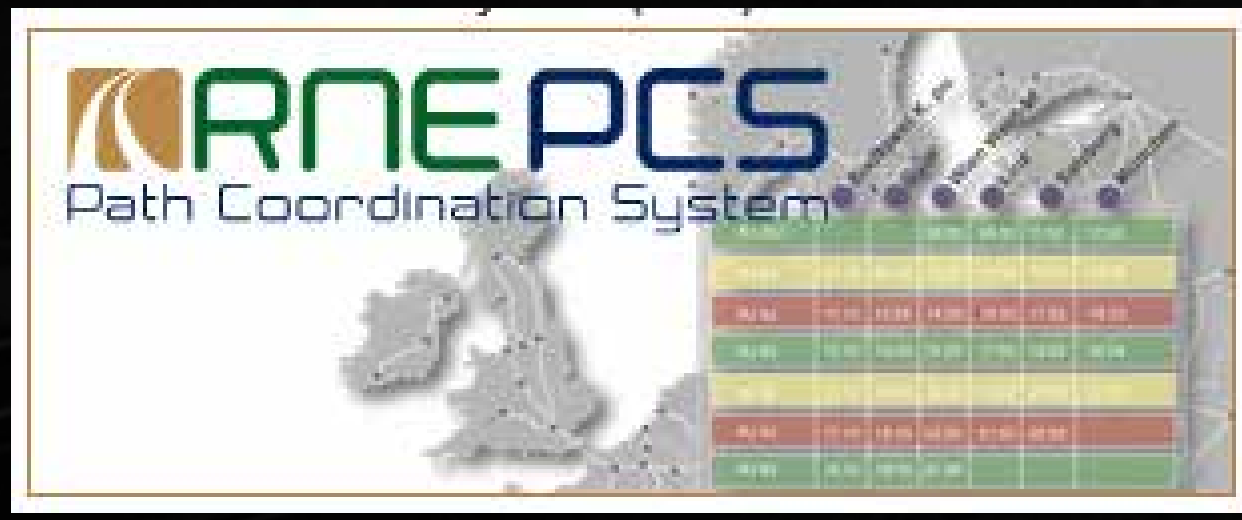
- Challenges:
- **Harmonization** the members' **medium and long-term planning**
 - **Develop and improve the regional (international) railway business:**
 - Facilitation of regional (International) traffic on the GCC Rail Infrastructure and beyond.
 - Harmonization of conditions and introduction of coordinated approaches to promote the GCC rail business from the rail infrastructure point of view
 - Harmonization the members' timetabling, marketing sales, and operations, as well as after-sales services, such as monitoring and reporting
 - **Creation of Ones Stop Shops** applying for regional (international) paths



- Outputs:
- **Development of software tools** for
 - Capacity allocation (Railway path coordination) for Regional (International) traffic
 - Charging Information System (software to calculate the price for the use of international train paths including charges for train paths, station fees and shunting fees).
 - Train Information System (application which visualizes international trains from origin to destination to deliver real-time train data directly to the users via internet).

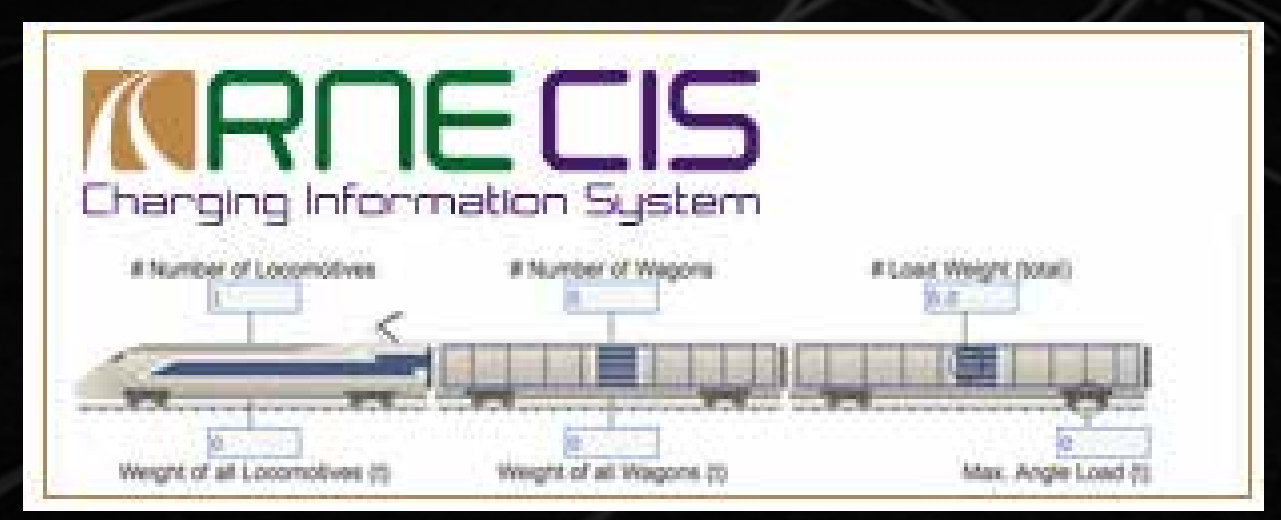
Examples from RailNet Europe

Path Coordination System (PCS)



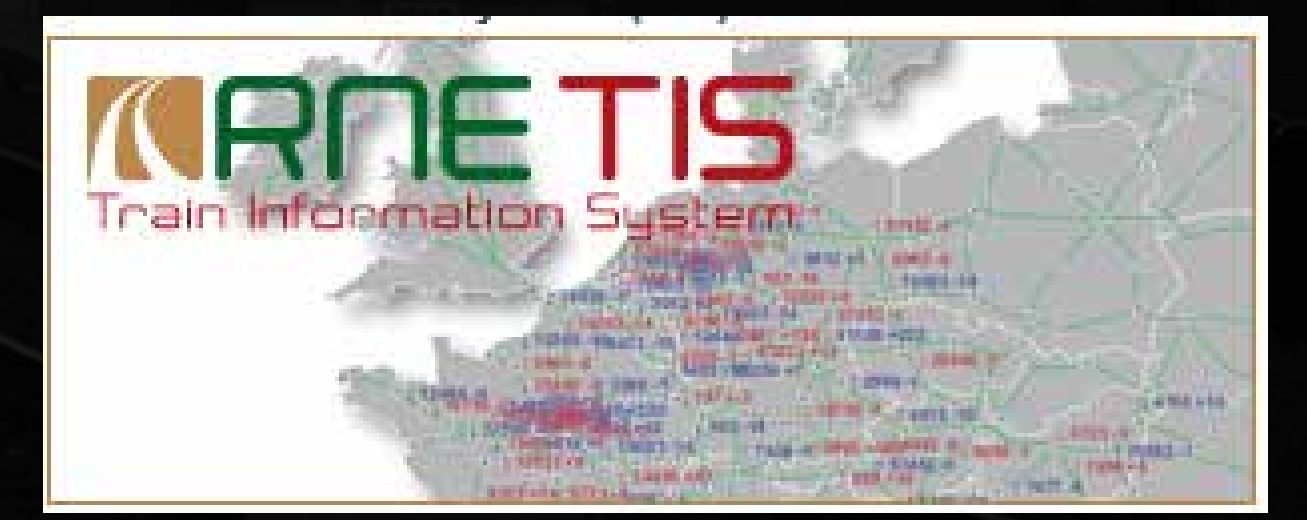
The IM and RU tool for processing international timetabling

Charging Information System (CIS)



European Infrastructure Pricing information

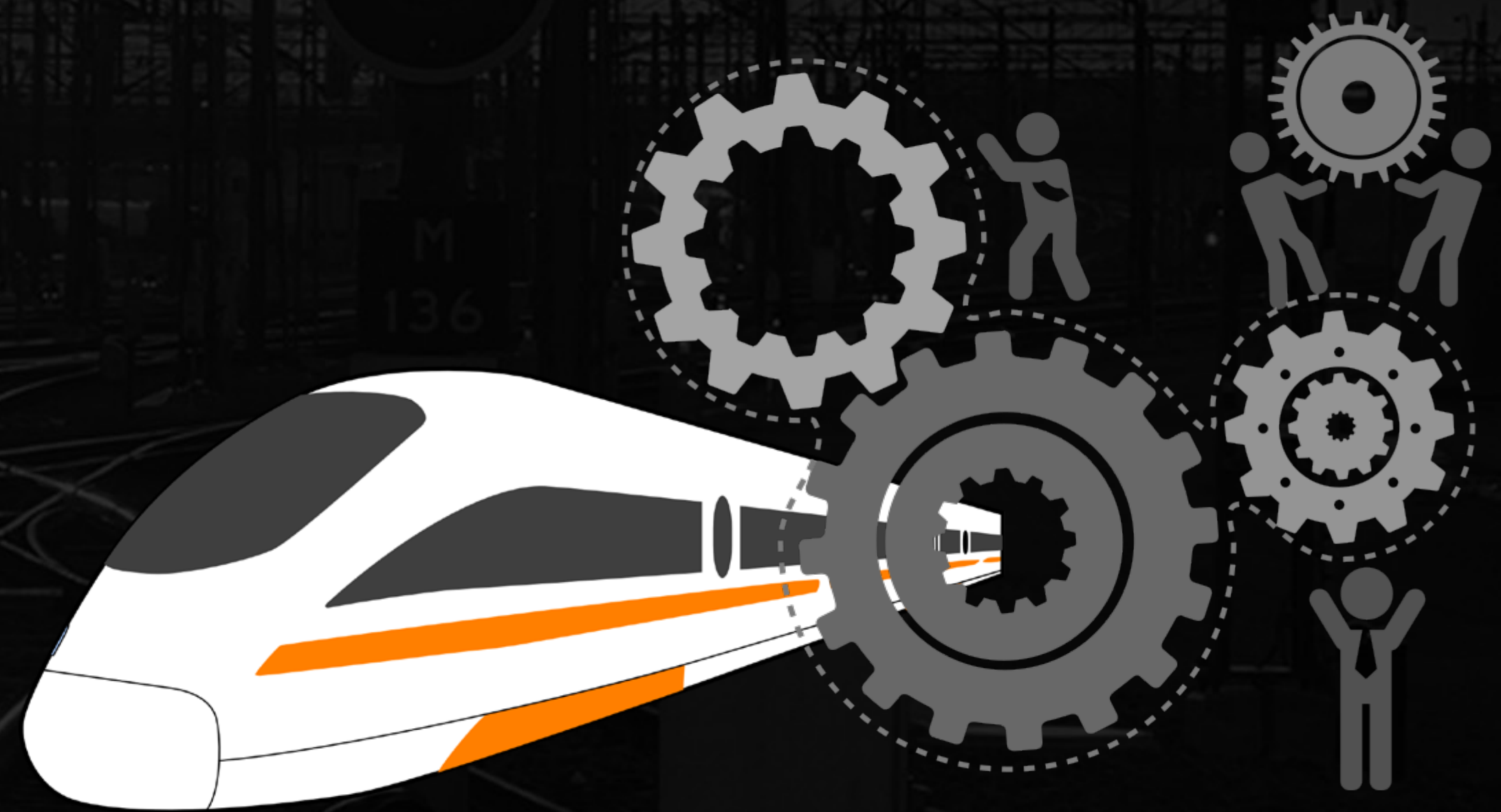
Train Information System (TIS)



Real-time supervision & management of European Rail Traffic

Business Operation issues

- Cooperation of the **Train Operating Companies** to promote cross-border rail freight and passenger traffic in GCC:
 - **Establishment of a coordination platform** for cross-border passenger traffic and freight traffic.

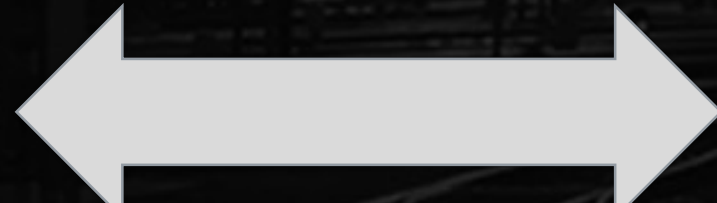
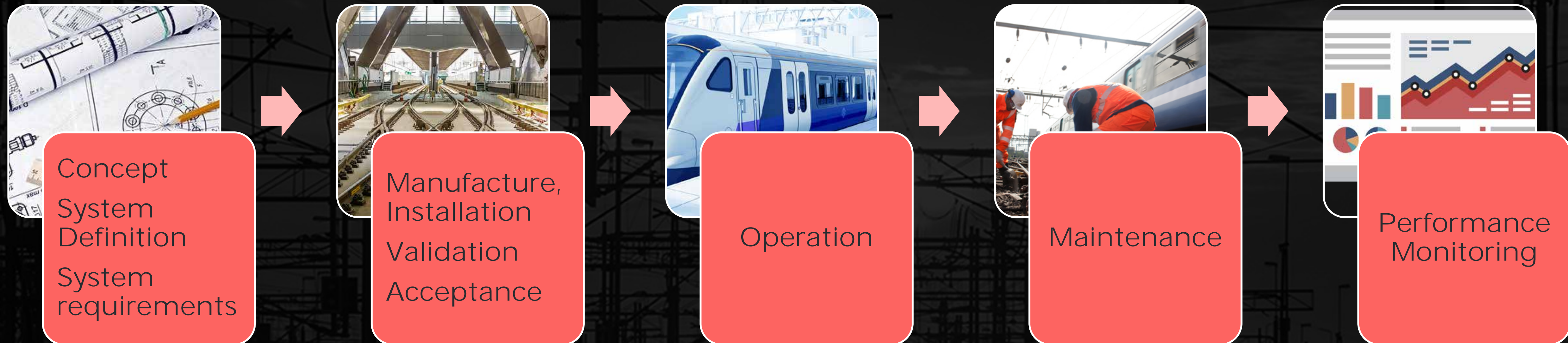


The stages for the development and operation of the railway system

Simplified

- Based on a general **lifecycle view**, as per EN 50126 ; the lifecycle starts when the product (our railway system) is in a concept phase.
- Then the product is developed, approved and put into operation and finally it is disposed.





Feasibility Study (2009)

- **Manufacture: Common Guidelines and other docs**
- Validation
- Acceptance

Rulebook and other docs

Business Operation issues



Completed

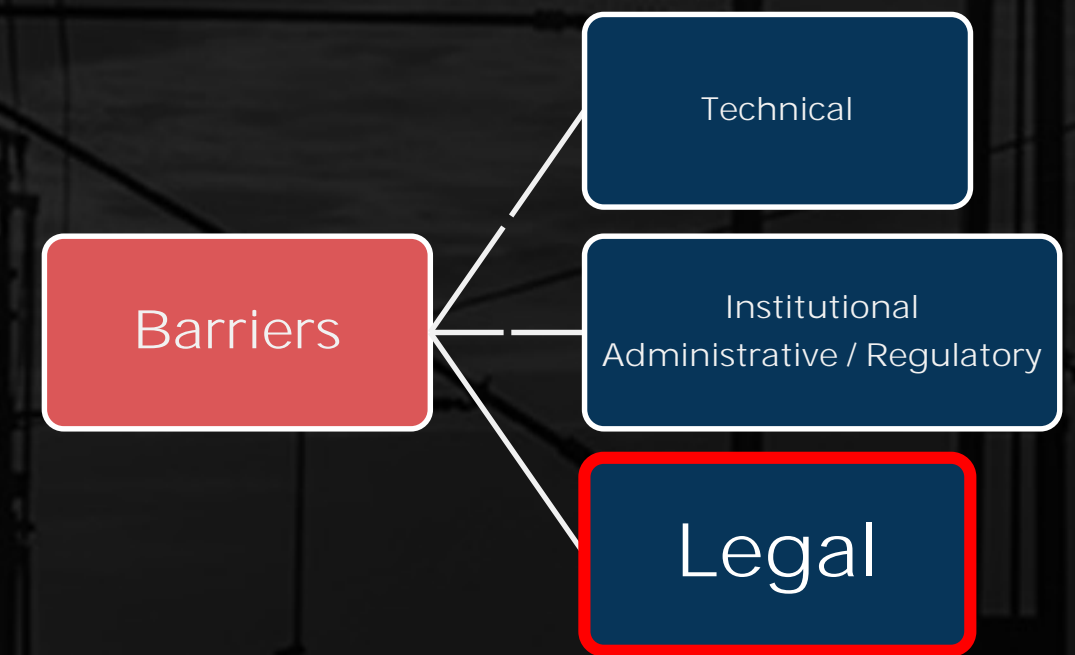
In progress

To be elaborated

What is the best structure for coordinating the development and operation of the GCC Railway System?



Legal Interoperability



What is legal interoperability? Why it is important?



A

B

From point A to point B:
One legal regime



Advantages

- Less administrative costs
- Legal certainty, less legal costs
- Optimisation of business operation

International railway law: COTIF main agreement and the annexes

COTIF
Convention concerning
International Carriage by Rail

Appendix A
CIV
UNIFORM RULES
CONCERNING THE
CONTRACT OF
INTERNATIONAL
CARRIAGE OF
PASSENGERS BY RAIL

Appendix B
CIM
UNIFORM RULES
CONCERNING THE
CONTRACT OF
INTERNATIONAL
CARRIAGE OF **GOODS**
BY RAIL

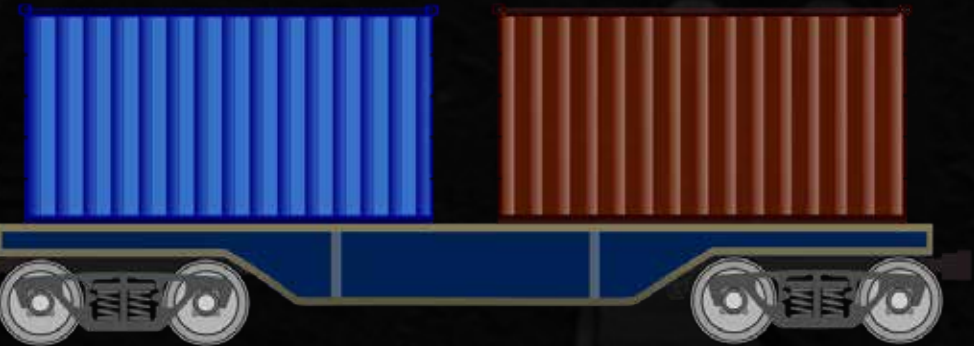
Appendix C
RID
REGULATION
CONCERNING THE
INTERNATIONAL
CARRIAGE OF
DANGEROUS
GOODS BY RAIL

Appendix D
CUV
UNIFORM RULES
CONCERNING
CONTRACTS OF **USE OF**
VEHICLES IN
INTERNATIONAL RAIL
TRAFFIC

Appendix E
CUI
UNIFORM RULES
CONCERNING THE
CONTRACT OF **USE**
OF
INFRASTRUCTURE
IN INTERNATIONAL
RAIL TRAFFIC

Appendix F
APTU
UNIFORM RULES
CONCERNING THE
VALIDATION OF
TECHNICAL
STANDARDS AND THE
ADOPTION OF
UNIFORM TECHNICAL
PRESCRIPTIONS
APPLICABLE TO
RAILWAY
MATERIAL INTENDED
TO BE USED IN
INTERNATIONAL
TRAFFIC

Appendix G
ATMF
UNIFORM RULES
CONCERNING THE
TECHNICAL
ADMISSION OF
RAILWAY MATERIAL
USED IN
INTERNATIONAL
TRAFFIC



OTIF activities

OTIF

- Develops **rail transport law** and deploys **tools to facilitate international rail traffic** (removal of obstacles to the crossing of frontiers in international rail transport)
- **Uniform Rules** created by OTIF are applicable
 - for international carriage by rail **on around 250,000 km of railway lines** and
 - the complementary carriage of freight and passengers on **17,000 km of shipping lines and inland waterways**, as well as prior or subsequent domestic carriage by road.



OTIF Member States (2016)

The Intergovernmental Organisation for International Carriage by Rail (OTIF) governs international rail transport.

- Member States
- Associate Members
- Membership suspended





MEMORANDUM OF UNDERSTANDING

Between

Intergovernmental Organisation for International Carriage by Rail (OTIF)

&

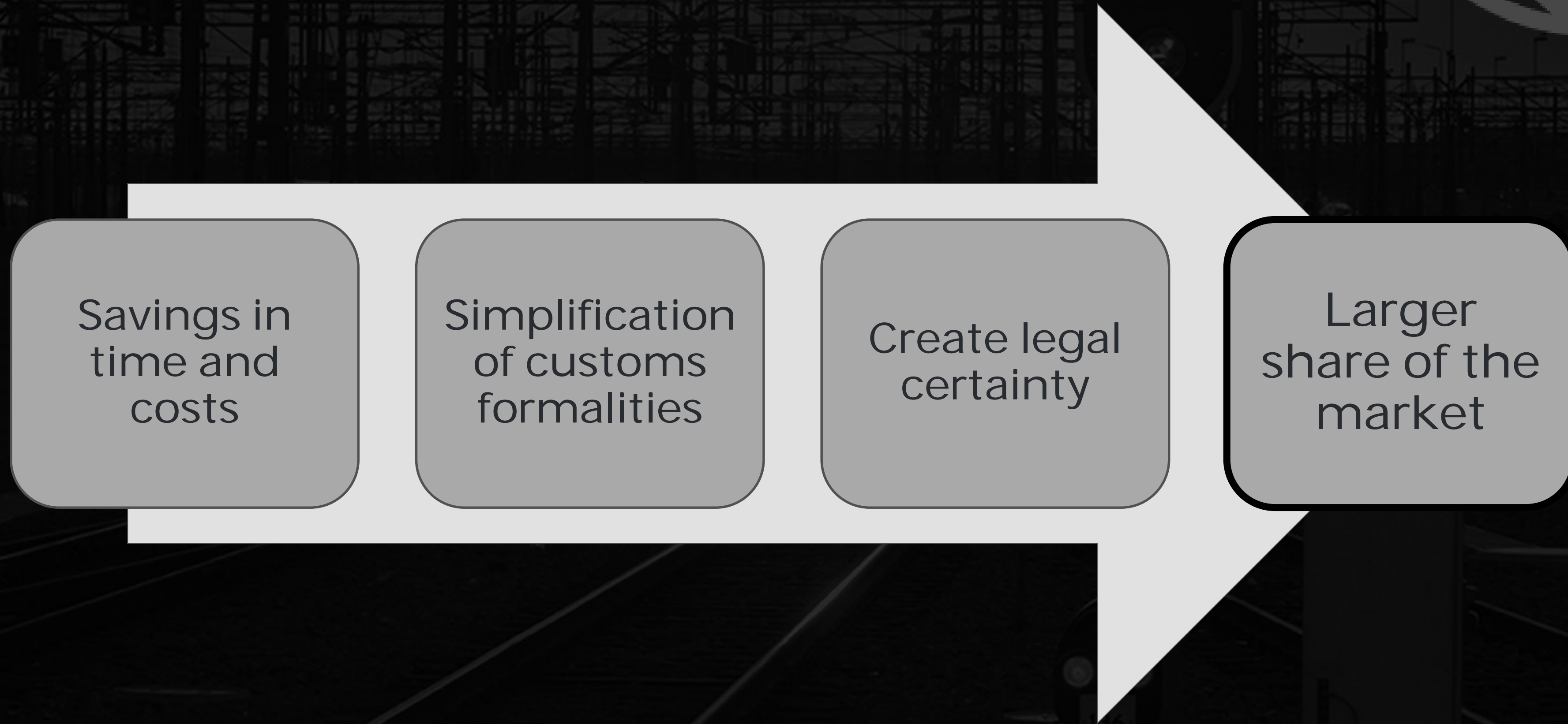
The Cooperation Council for the Arab States of the Gulf- The Secretariat
General (GCC-SG)¹

March 19, 2014



COTIF

(Convention concerning International Carriage by Rail)



Savings in
time and
costs

Simplification
of customs
formalities

Create legal
certainty

Larger
share of the
market

I would like to thank you for your attention!

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