



# Priority Issues in European Railway Operations

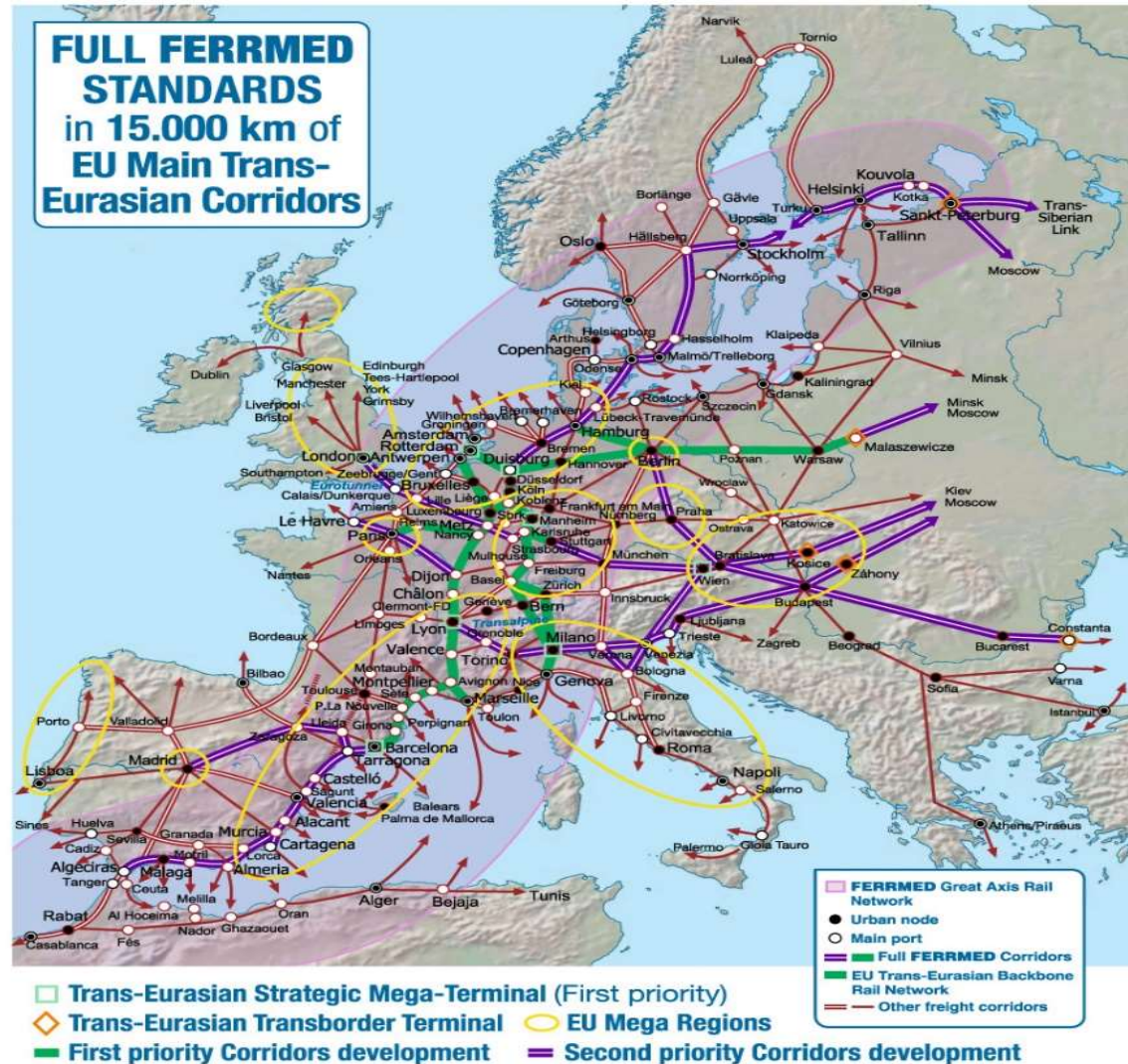
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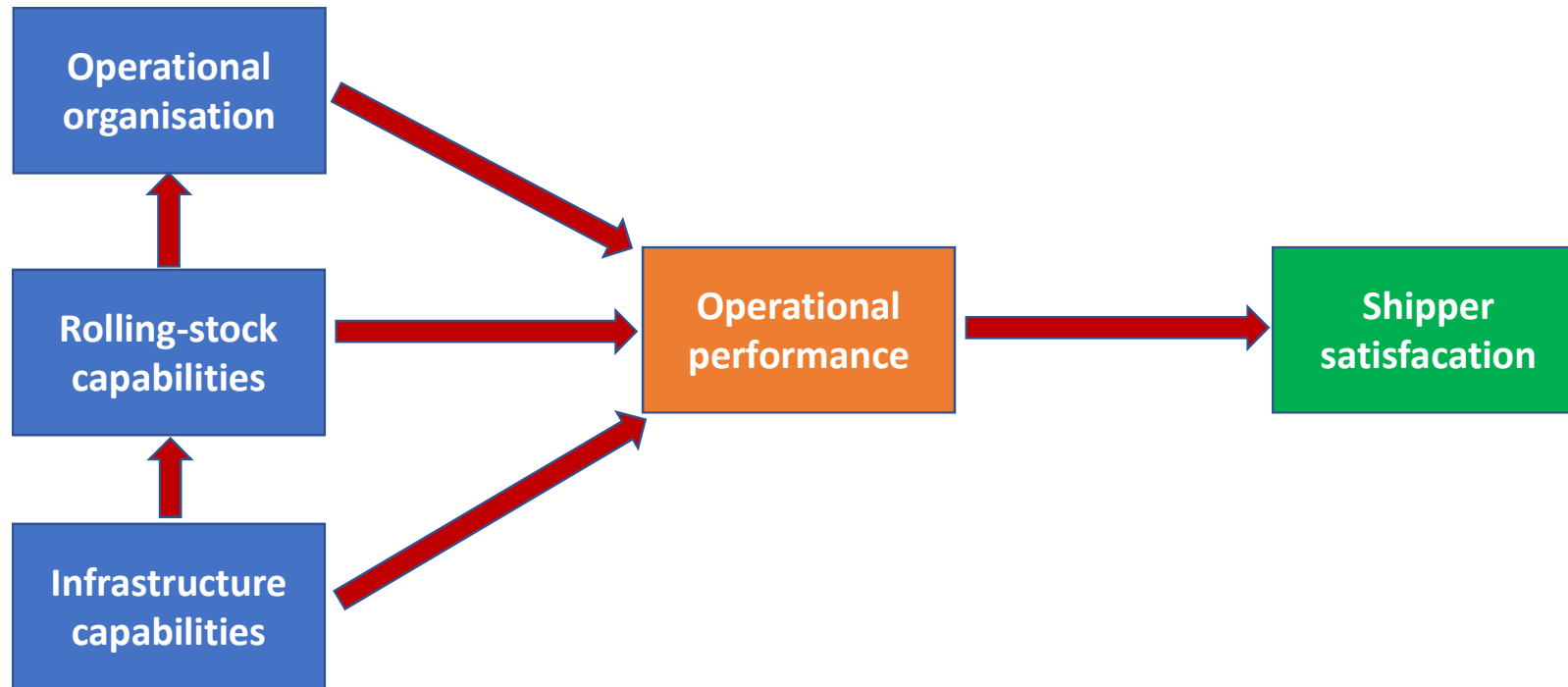


# FERRMED EU Trans-Eurasian Backbone Rail Network (6000 km)





# Dependencies among the three FERRMED Working Groups





# Operational issues dependant on infrastructure (1)

For more and better train paths for shippers:

- Length of train: 750 m, with locomotive(s).
- Loading gauge P400.
- Bottlenecks and missing links.
- Completion of ERTMS coverage: Baseline 3 (not be confused with Level 3) for full interoperability and backward compatability.



## Operational issues dependant on infrastructure (2)

Required network of terminals for shipper:

- Supports **both intermodal (combined transport) and single-wagon-load**.
- **Six or seven Trans-European strategic mega-terminals** (may or not be ports).
- **Ports** that are not mega-terminals.
- **Intermediate terminals** that serve intermediate logistics areas and final customers.
- **Gauge-changing terminals**, which may or may not be near national borders.



## Operational issues dependant on infrastructure (3)

Terminals must be adequate in terms of:

- **Terminal capacity:** Number and length of tracks; corresponding handling and service capacities; room for future expansion.
- **Terminal connectivity:**
  - ERTMS.
  - all electrification systems used in the region.
  - all track gauges used in the region.



# Operational improvements dependant on rolling stock (1)

Contributors to more and faster paths:

- **Fewer stops to change locomotives:** Equip locomotives with ERTMS
- **Faster shunting and splitting/joining of long trains:** automatic coupler
- **More line capacity:** new coupler with data bus allowing:
  - electronically controlled brakes (for faster, more predictable braking) and
  - train integrity monitoring (for ERTMS Level 3 with „moving block“).



# Operational improvements dependant on rolling stock (2)

Contributors to better service for shippers:

Shipper service requirement	Power bus in new coupler	Data bus in new coupler
<ul style="list-style-type: none"><li>• <b>Where is my shipment?</b></li><li>• <b>How is my shipment?</b></li></ul>	Power for sensors	<ul style="list-style-type: none"><li>• Automatic reporting of train consist</li><li>• Locomotive reports location and readings of sensors on wagons and loading units for entire train consist</li></ul>
<b>Temperature control</b>	Power for heating and cooling	





# Operational improvements dependant on rolling stock (3)

Contributors to meeting shippers' requirements:

Shipper requirements	Operational requirements	Underlying rolling-stock improvement
<b>Lower costs per shipment</b>	<b>Better-loaded trains</b>	<ul style="list-style-type: none"><li>• More available loading length within wagon</li><li>• Better adaptation of wagon length to current loading units</li></ul>
<b>Feasibility and low cost</b>	<b>Availability and cost of rolling stock fleet</b>	<ul style="list-style-type: none"><li>• Available to all RUs</li><li>• Able and certified to run on all lines</li></ul>



# Operations' dependancy on both rolling stock and infrastructue

Contributors to giving rail same versitility as road:

Shipper requirements	Operational requirements	Underlying rolling-stock improvement
<b>Rail must have same versitility as road</b>	<b>Ability to move more types of loading units, such as 4-metre-high truck trailers</b>	<ul style="list-style-type: none"><li>• Lower wagon floor</li><li>• Improved loading gauge</li></ul>



# Operational issues: Integrated management, track work and ETA

Shipper requirements:

- **Integrated management** at corridor level of the planning and execution of train operations.
- **Track work:** Better coordination and information about track work projects.
- **Better estimated time of arrival (ETA)** for shippers based on:
  - Geo-localisation of trains and wagons.
  - Seamless tracking of trains over a whole corridor.
  - Data exchange on planned paths (in normal and disrupted operation) based on TAF TSI.



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