Overland Transport Development in the "Belt and Road" Initiative

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Overland Transport Development in the “Belt and Road” Initiative

CBS “Logistics Clusters”
4 December, 2020
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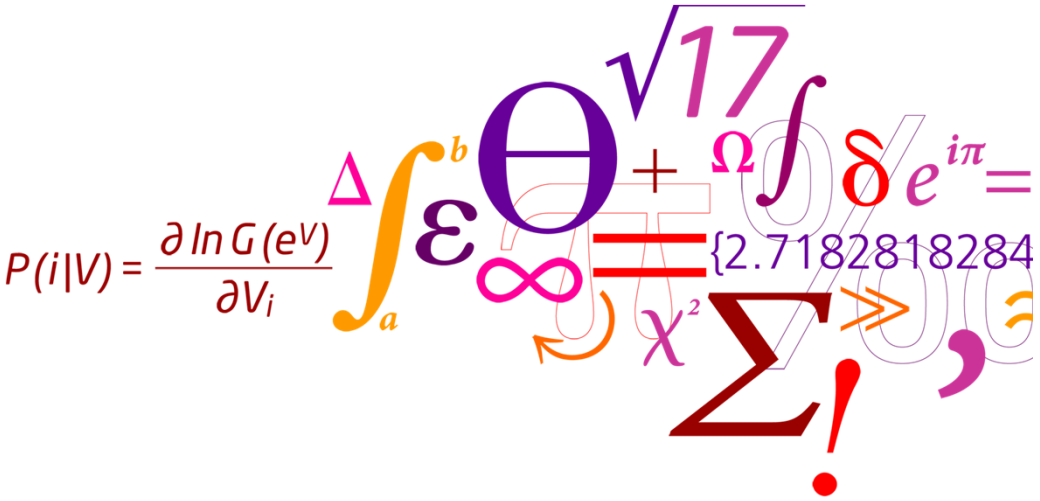
Technical University of Denmark



Introduction

- Introduction to railway intermodal and relationship to clusters
- Explanation of the Belt and Road Initiative
- Railway links Europe-Asia
- Trade forecasts Europe-Asia
- An Example

About Me

1986

2015

Railway Freight and Sustainability

- Railways are extraordinarily well suited to large volumes of freight
  - Highest weight limit of any mode
  - 3x unit volume – railway wagon compared to truck
- Extraordinary sustainability support
  - Can be entirely zero-carbon for direct energy consumption
  - Lowest energy consumption for land-based transport
- Energy consumption
  - Kilojoules per tonne-kilometer
  - USA figures (comparable to Russia-Asia)
  - Road: 2426, Rail: 209, 12:1
  - Germany – 4:1
- Sustainability is greater with longer, heavier trains, over longer distances

Logistics Clusters and Railways

- Railways have lost market share due to dispersion
  - More remotely located facilities on cheap land
  - Government policies that favor development on road networks
  - Lower density makes consolidation of large traffic flows more difficult
- *A logistics cluster offers a concentrated, high density traffic flow to one location*

Ideal for railways

GM Flint Assembly

Inbound parts

Boxcars

Truck frames

Finished Vehicle Shipment

Assembly plant from 1947

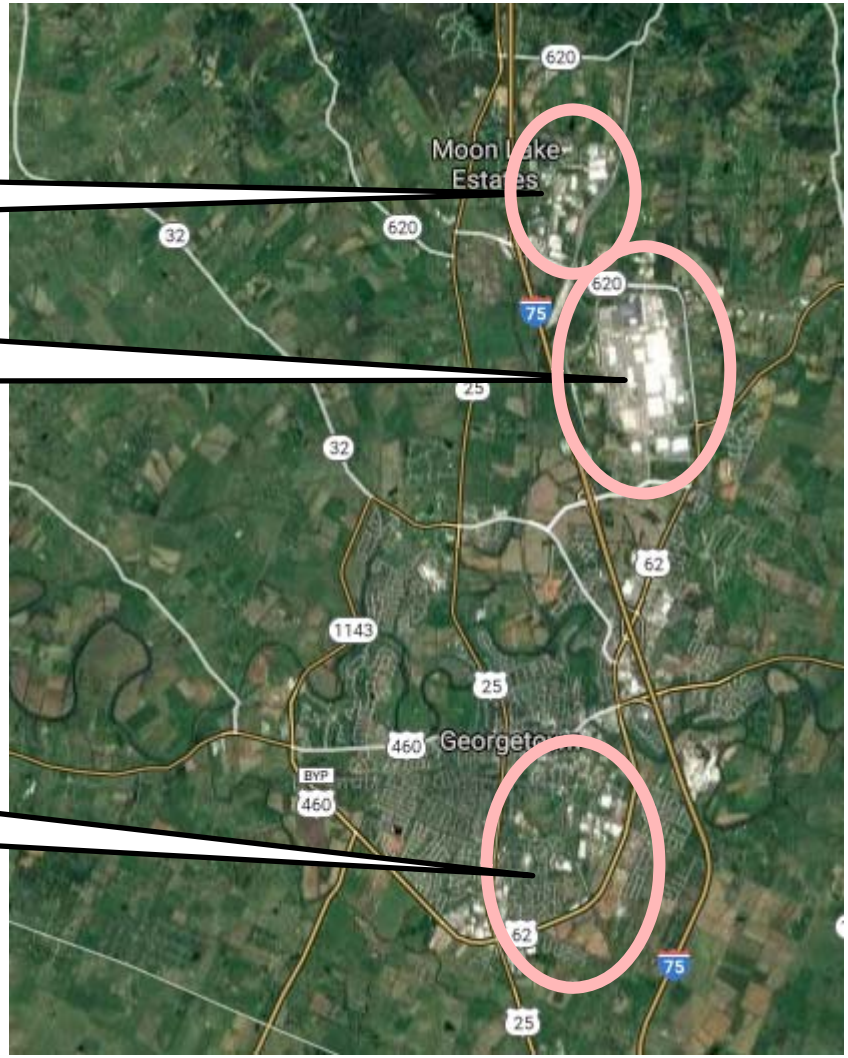
Truck Frames
Arriving for Assembly

Modern Cluster
Toyota Assembly, Kentucky (1986)

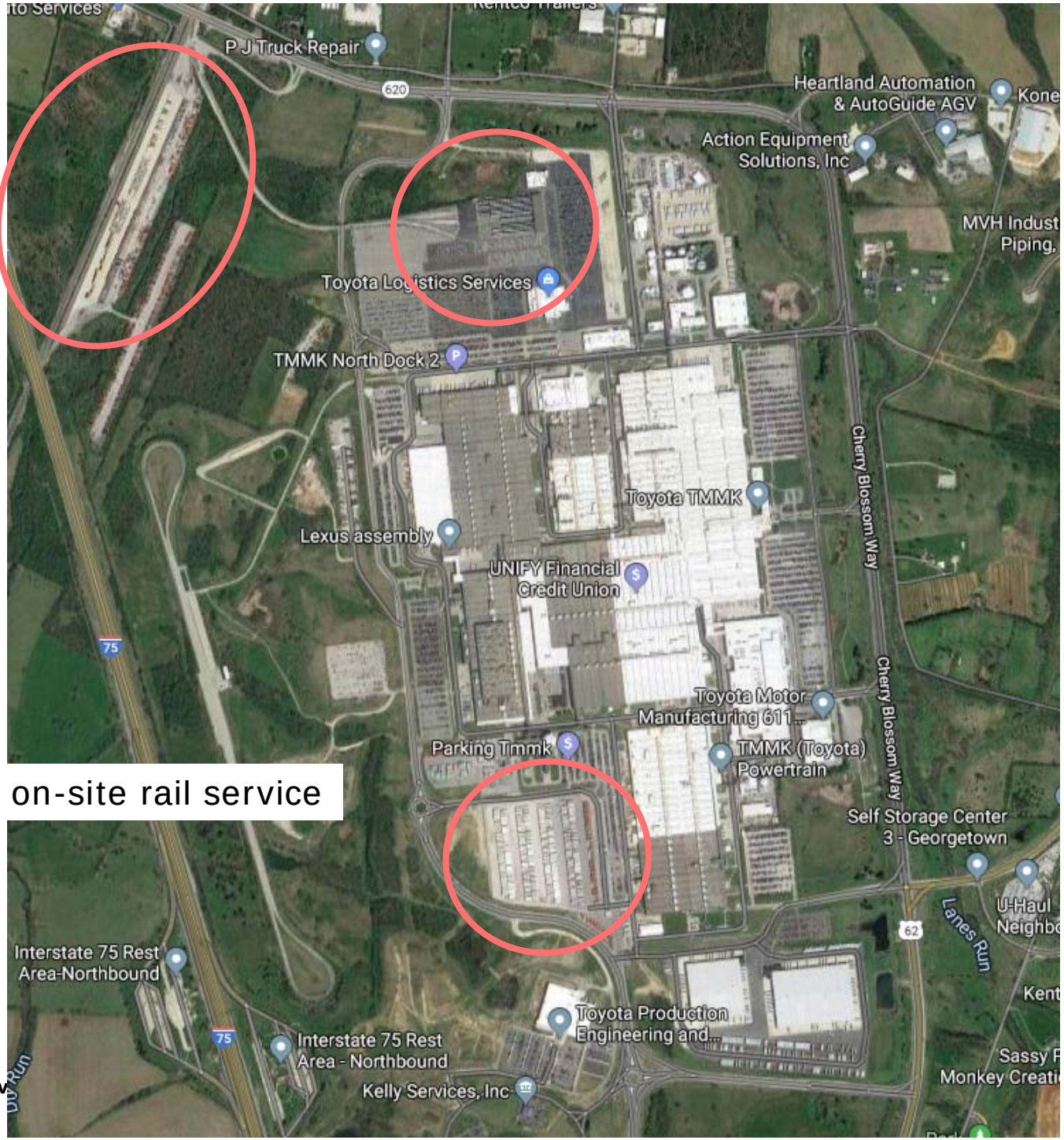
Suppliers

Toyota Assembly

Suppliers



Reduction in on-site rail service



Examples of Railway Logistics Clusters

Dry Ports

Links to maps are embedded

Dry Port Schematic

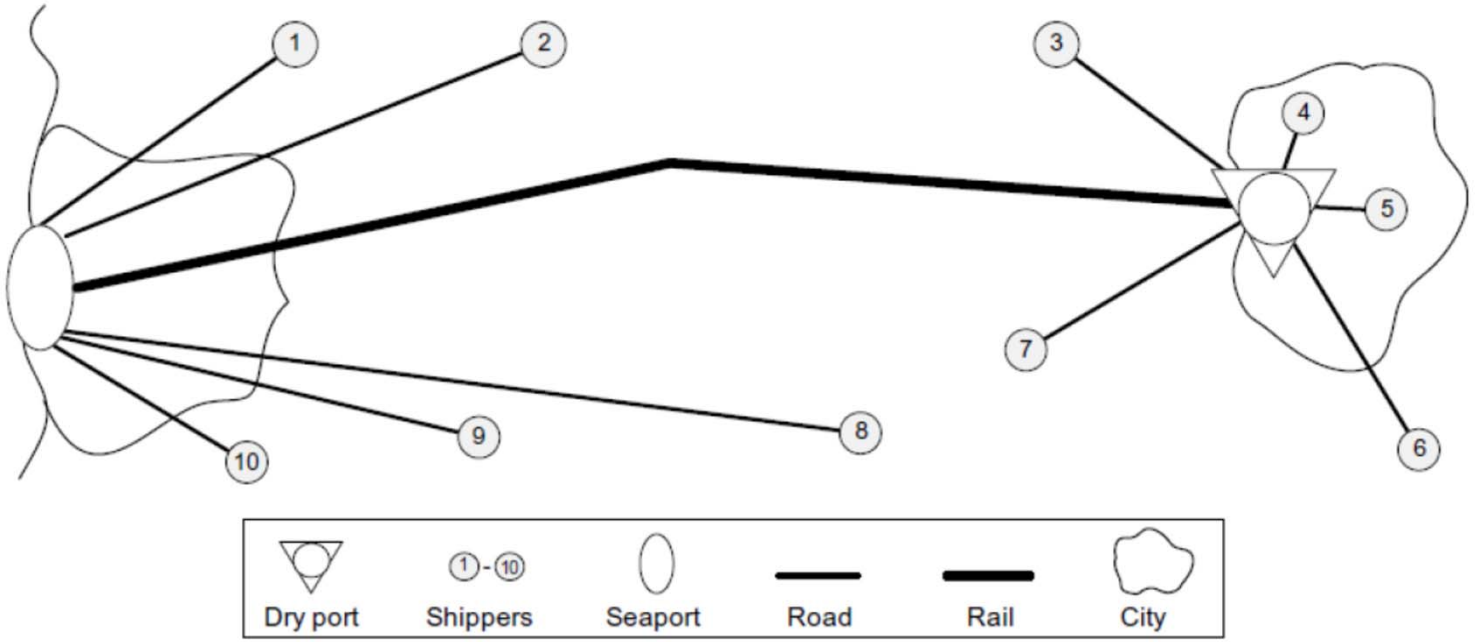


Figure 8: A seaport with a distant dry port (Roso et al., 2009)

Thanks to: Matthias Schett, 2015, MSc "Container Shuttle Train Feasibility in Denmark"

Terminal Costs are Frequently a Deciding Factor

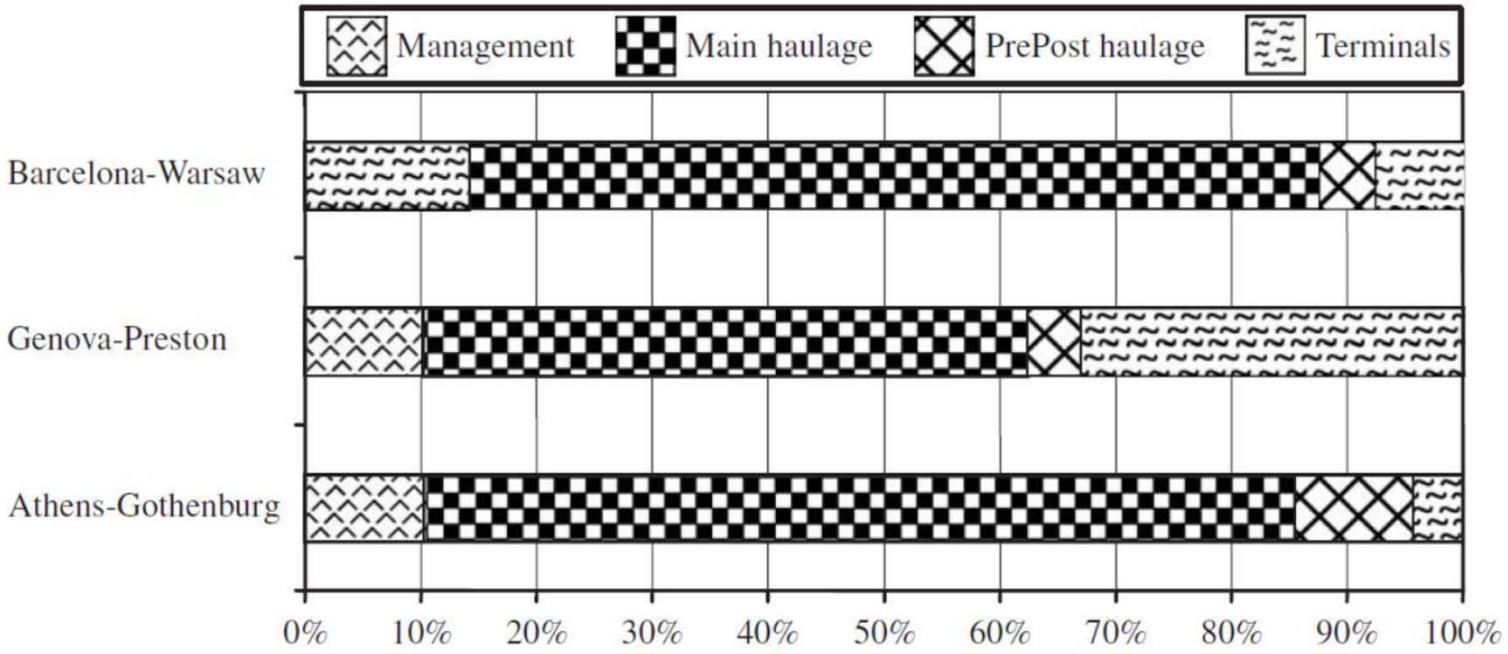


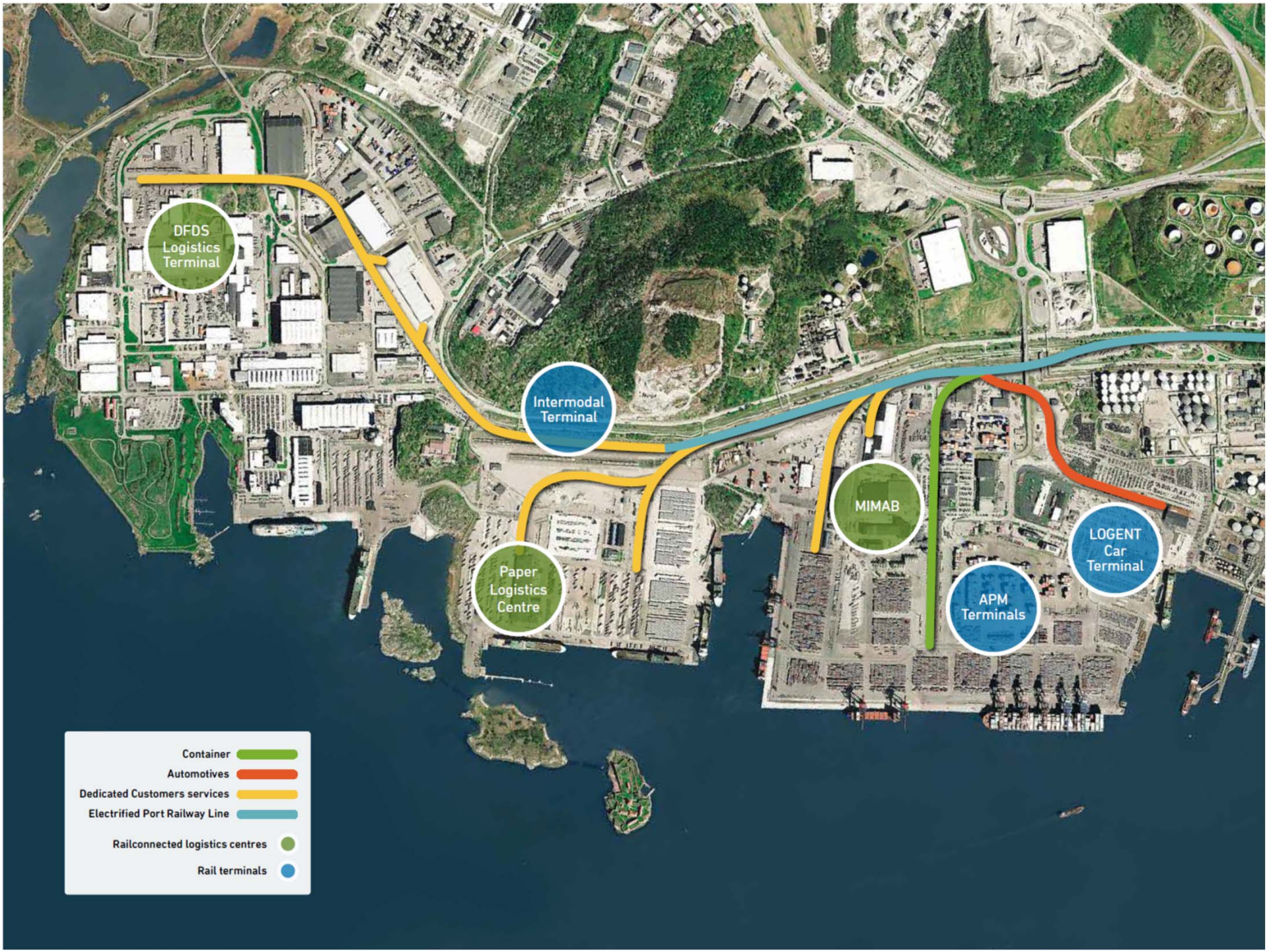
Figure 7: Composition of cost factors on selected intermodal transport routes (Ricci and Black, 2005)

Examples of Railway Logistics Clusters

High Density Shuttles

- Daily
- Full trains

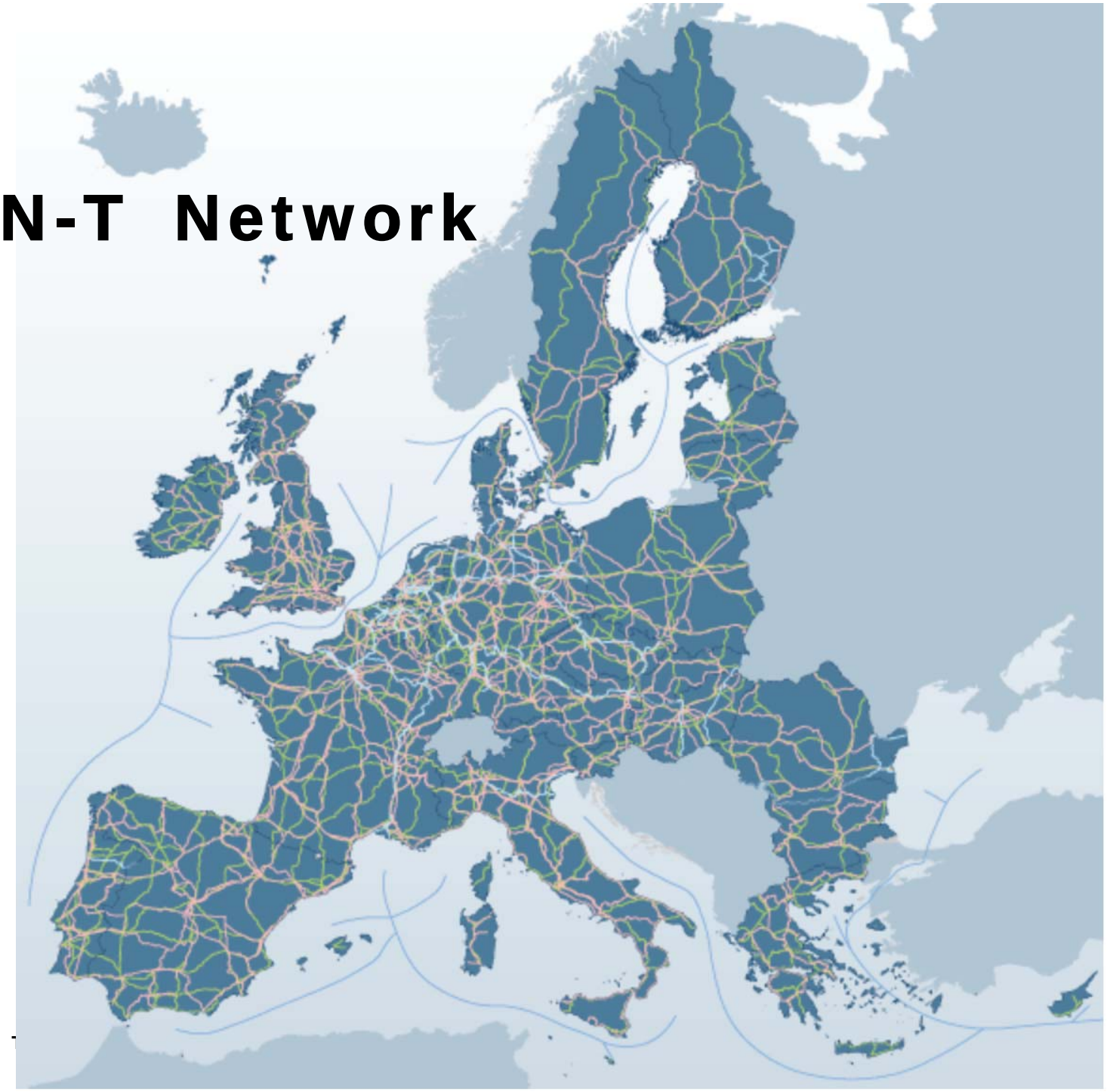
Figure 3-1 Port of Göteborg Rail System as of November 2005. Source: Port of Göteborg, 2005.

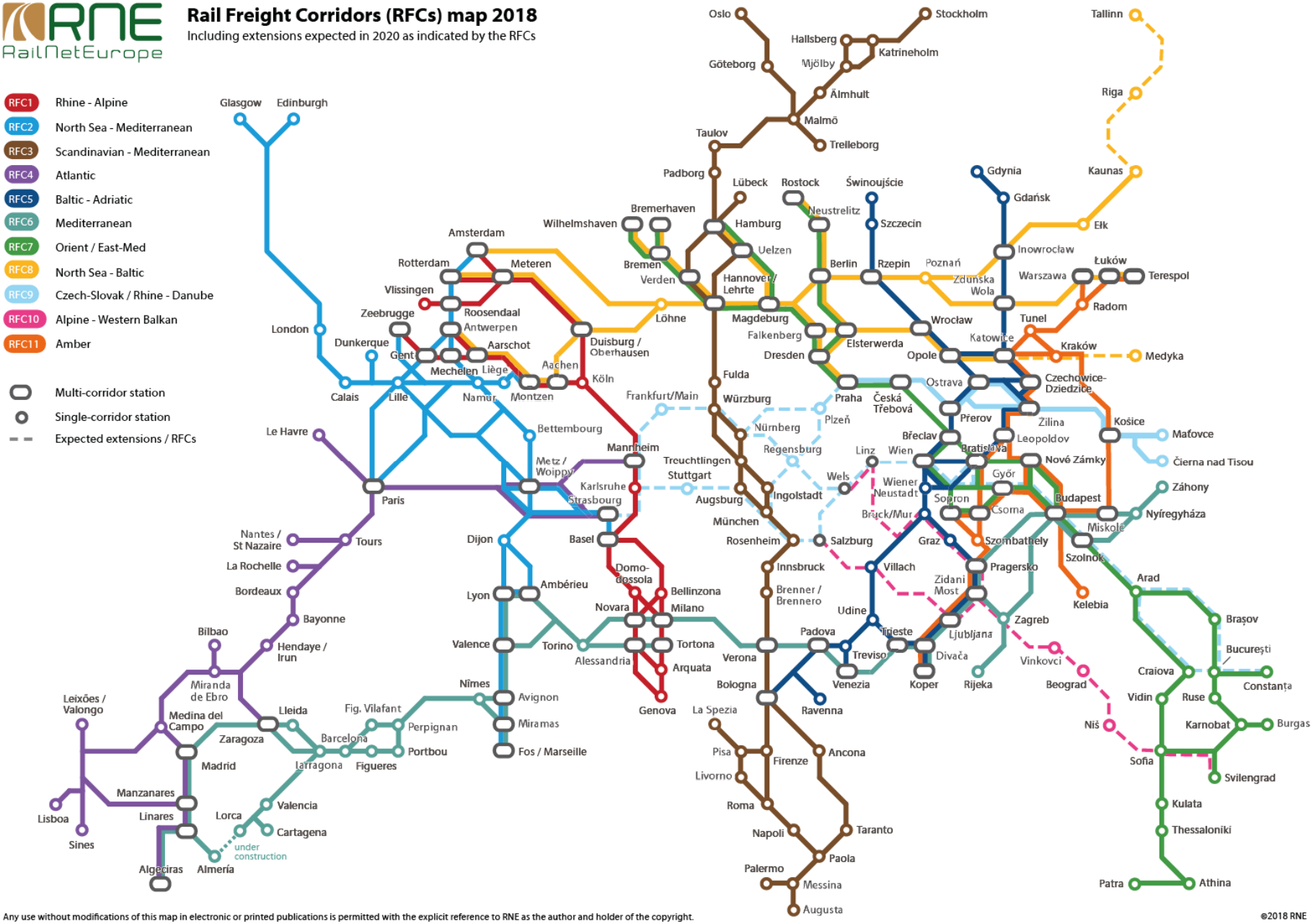

DFDS Logistics Terminal
Intermodal Terminal
MIMAB
LOGENT Car Terminal
Paper Logistics Centre
APM Terminals
Container
Automotives
Dedicated Customers services
Electrified Port Railway Line
Railconnected logistics centres
Rail terminals

Europe Has a Development Policy

- ”Ten-T” is a designated EU network of (mostly) rail, marine, and road freight transport
  - –To be preserved
  - –To be eligible for EU investment funds
- ”RFC” : Rail Freight Corridor
  - –Priority corridors
  - –”One stop shop” management
  - –Priority for technical improvements for capacity and reliability

TEN-T Network





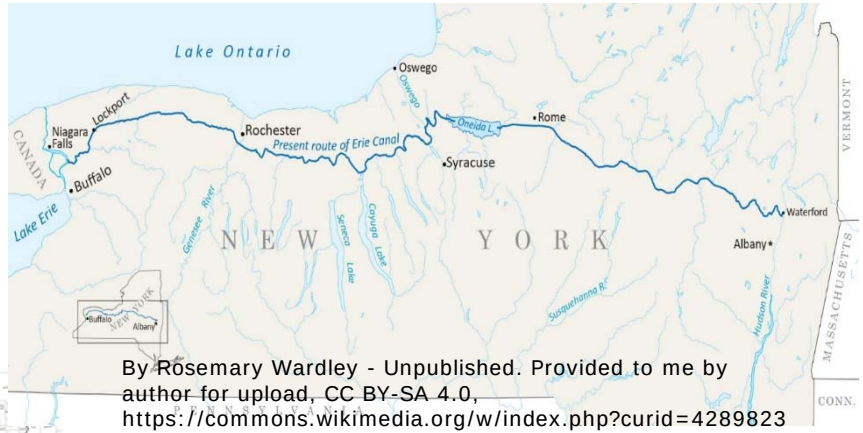
RailNetEurope (2018) Rail Freight Corridors (RFCs) map 2018, Vienna, (http://www.rne.eu).

Now China is engaged in Belt and Road

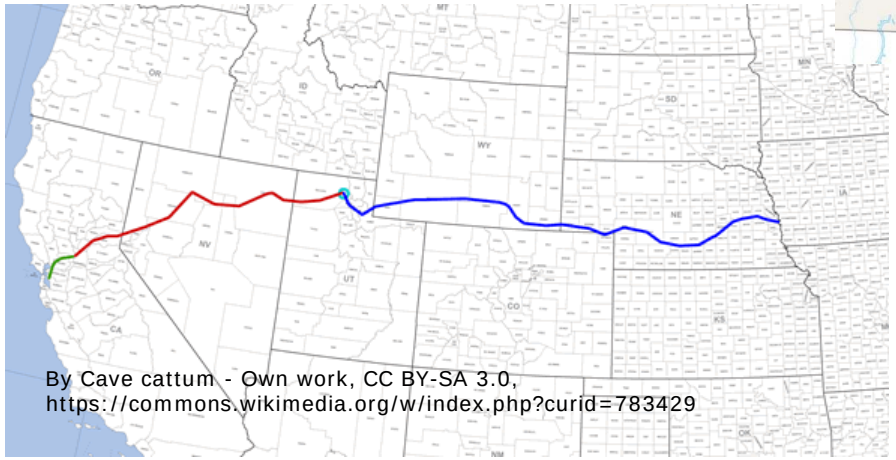
- "covering more than 68 countries, including 65% of the world's population and 40% of the global gross domestic product as of 2017"
  - "Belt" refers to the land routes
  - "Road" refers to the sea routes (confusing?)
- Originates in 2013
- Funding
  - Asian Infrastructure Investment Bank, US$100 billion
  - Silk Road Fund, US$40 billion

https://en.wikipedia.org/wiki/Belt_and_Road_Initiative

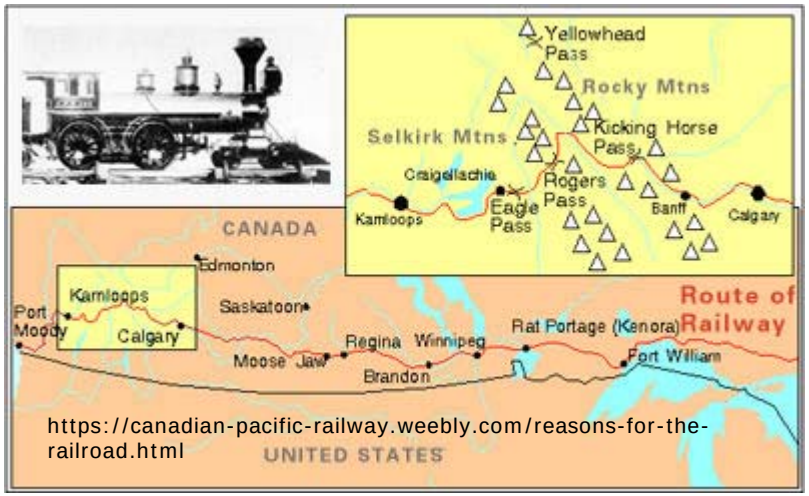
There is a long history of nationbuilding with transport projects…



By Rosemary Wardley - Unpublished. Provided to me by author for upload, CC BY-SA 4.0, https://commons.wikimedia.org/w/index.php?curid=42898236

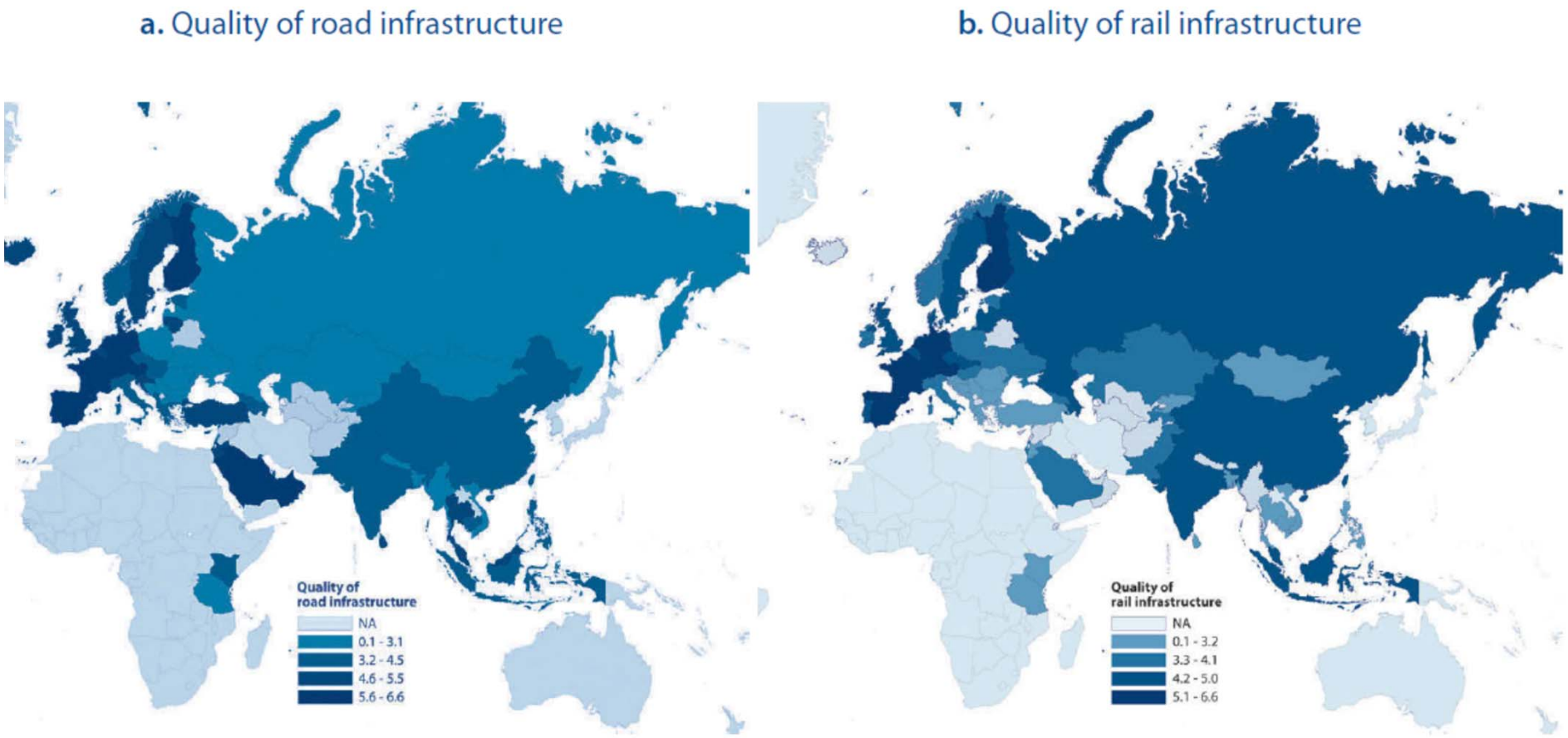


By Cave cattum - Own work, CC BY-SA 3.0, https://commons.wikimedia.org/w/index.php?curid=783429

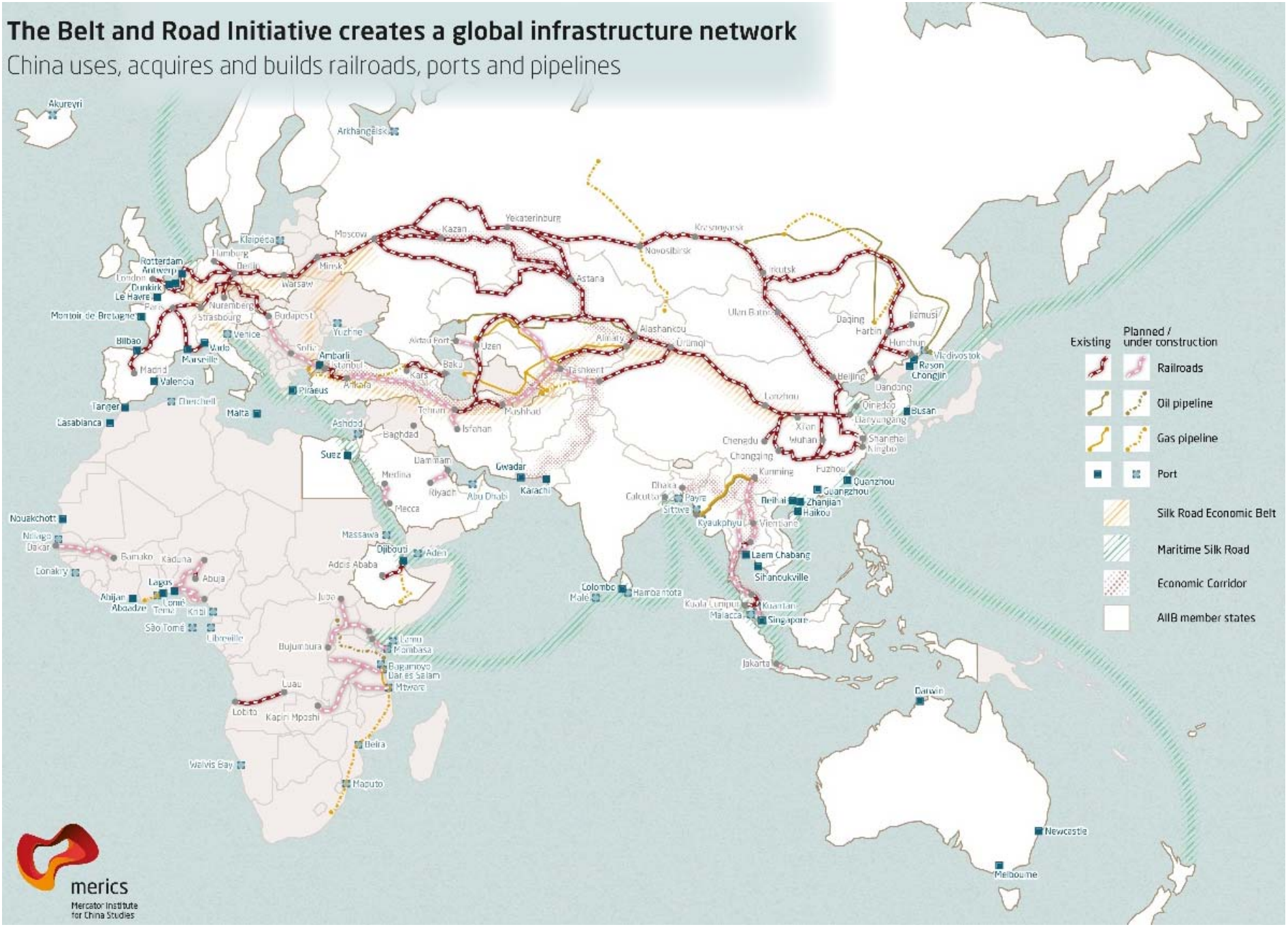


https://canadian-pacific-railway.weebly.com/reasons-for-the-railroad.html

Rail is a big player in Asia



DOI: 10.1596/978-1-4648-1392-4


The Belt and Road Initiative creates a global infrastructure network
China uses, acquires and builds railroads, ports and pipelines
Existing
Planned / under construction
Railroads
Oil pipeline
Gas pipeline
Port
Silk Road Economic Belt
Maritime Silk Road
Economic Corridor
AIIB member states
merics
Mercator Institute for China Studies

The ”Belt” has three declared collection zones

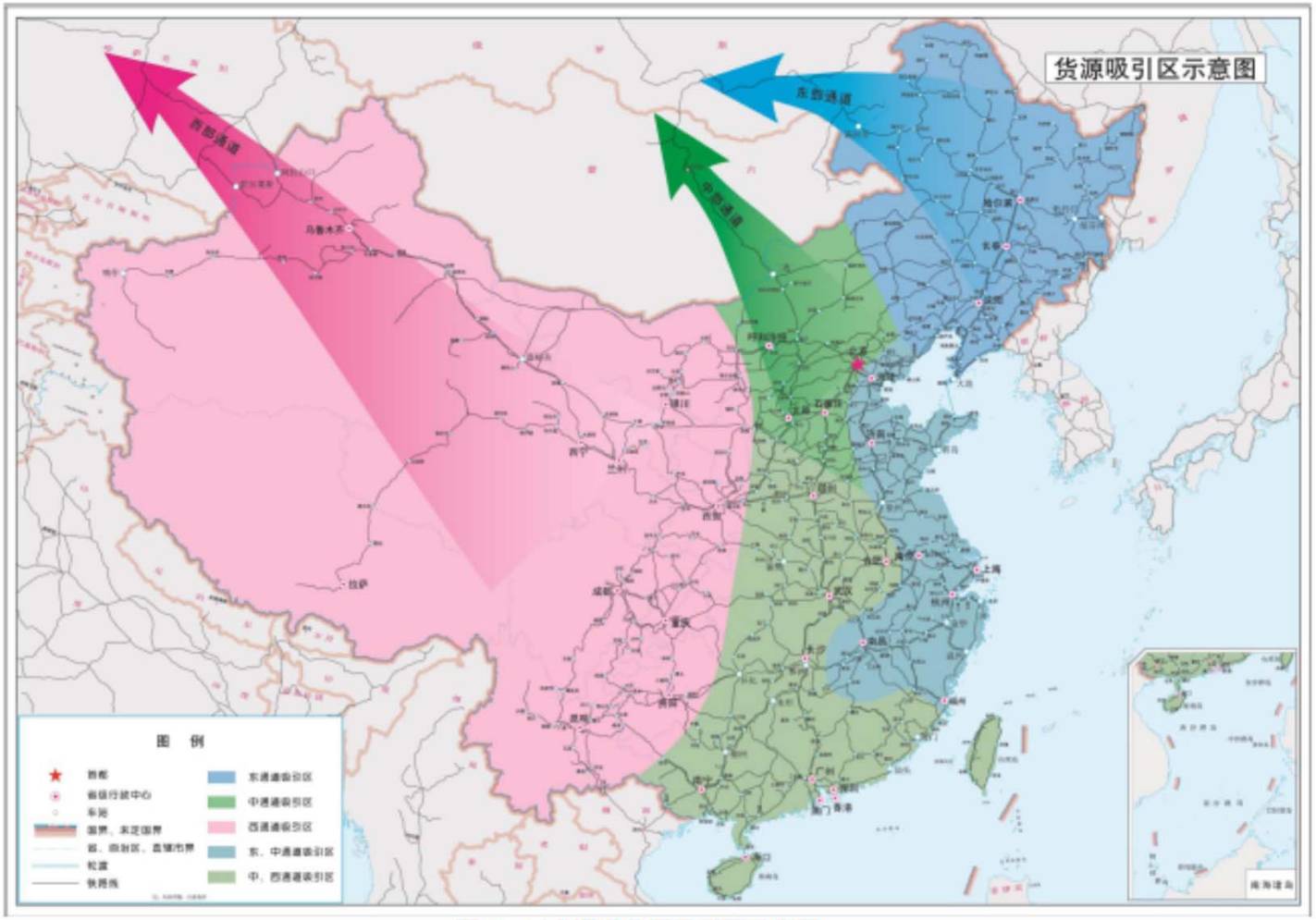
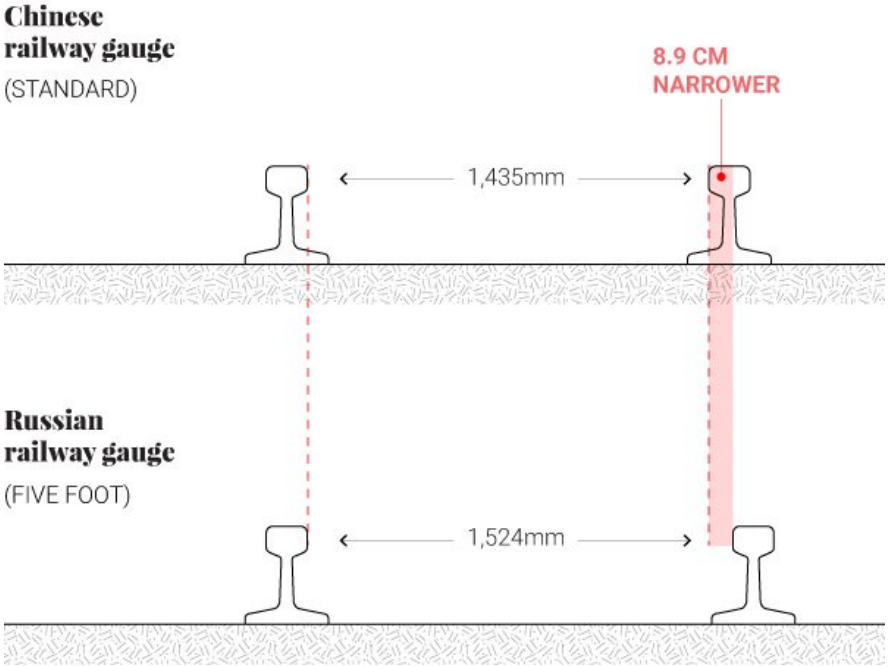
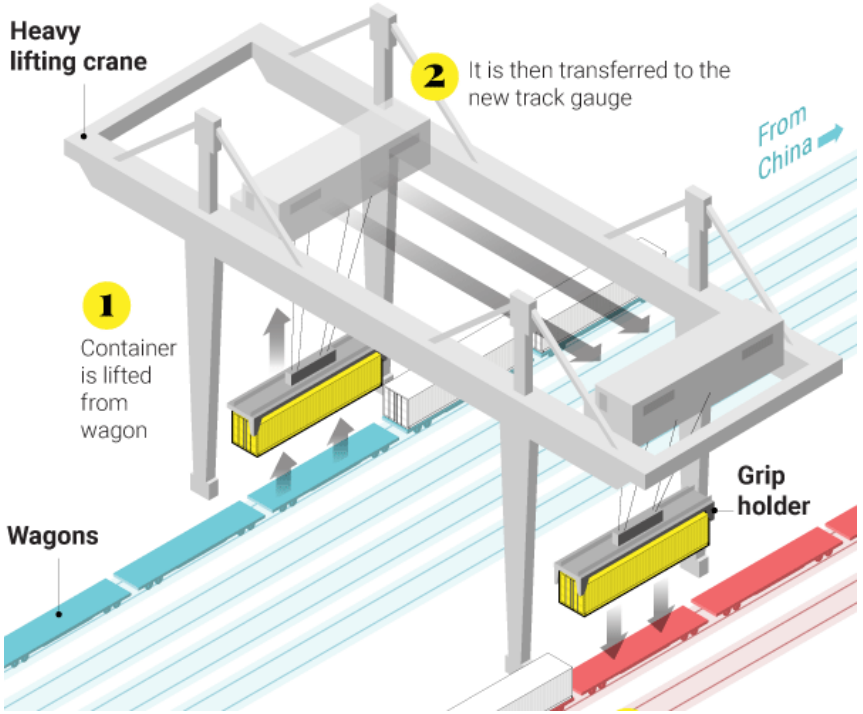


图 2　三大通道货源吸引区示意图

Challenges in Overland Rail Route

- Russian railway gauge is different
- National borders and inspections
- Train length differences China-Russia-EU, 55:75:44 FEU



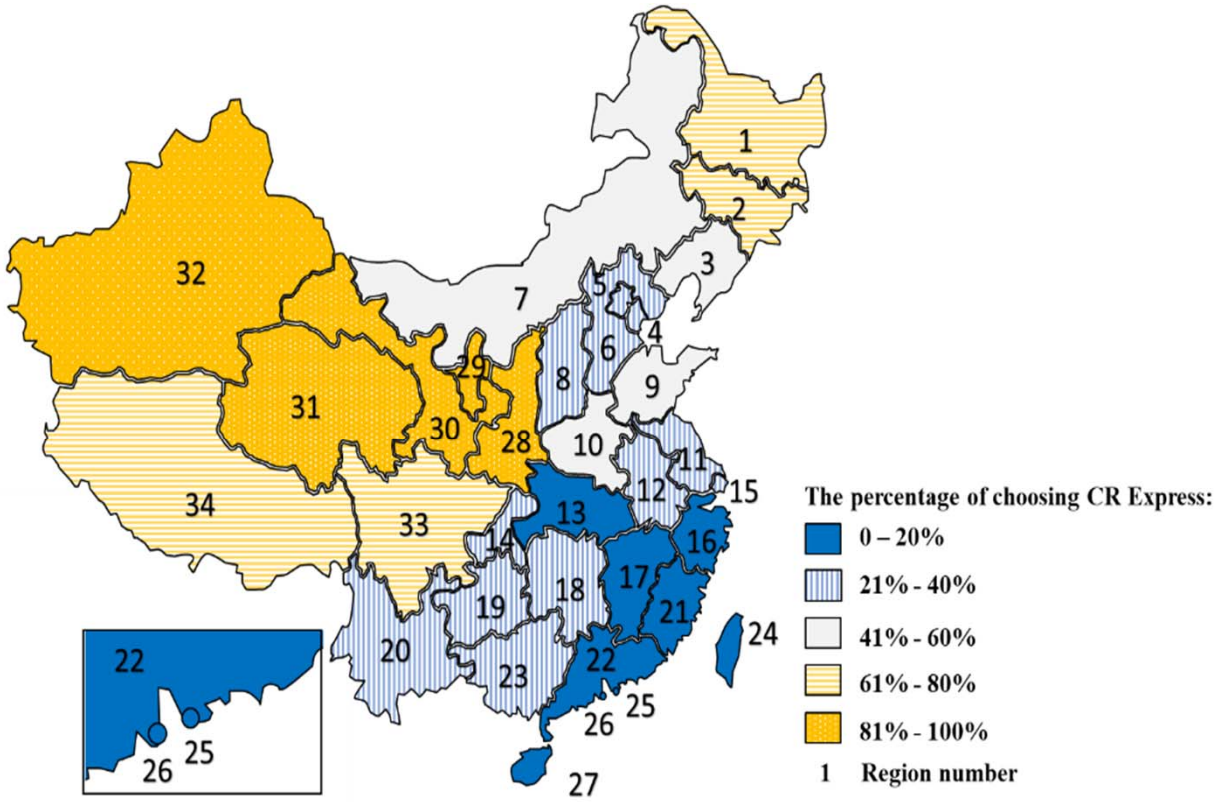


https://multimedia.scmp.com/news/china/article/One-Belt-One-Road/khorgos.html

In spite of this, great improvements in last 10 years

- Rail: Shanghai – Hamburg
  - 11.249 rail km
  - 16 days (about half of which is actually waiting in terminals)
  - US$6.350 per 40 foot container
  - 16,9 km per hour!
- Ocean:
  - 20.053
  - 32 days
  - US$2.410
- Road:
  - Bing maps drive time 116 hours= 4,8 days

Inland zones more likely to choose rail

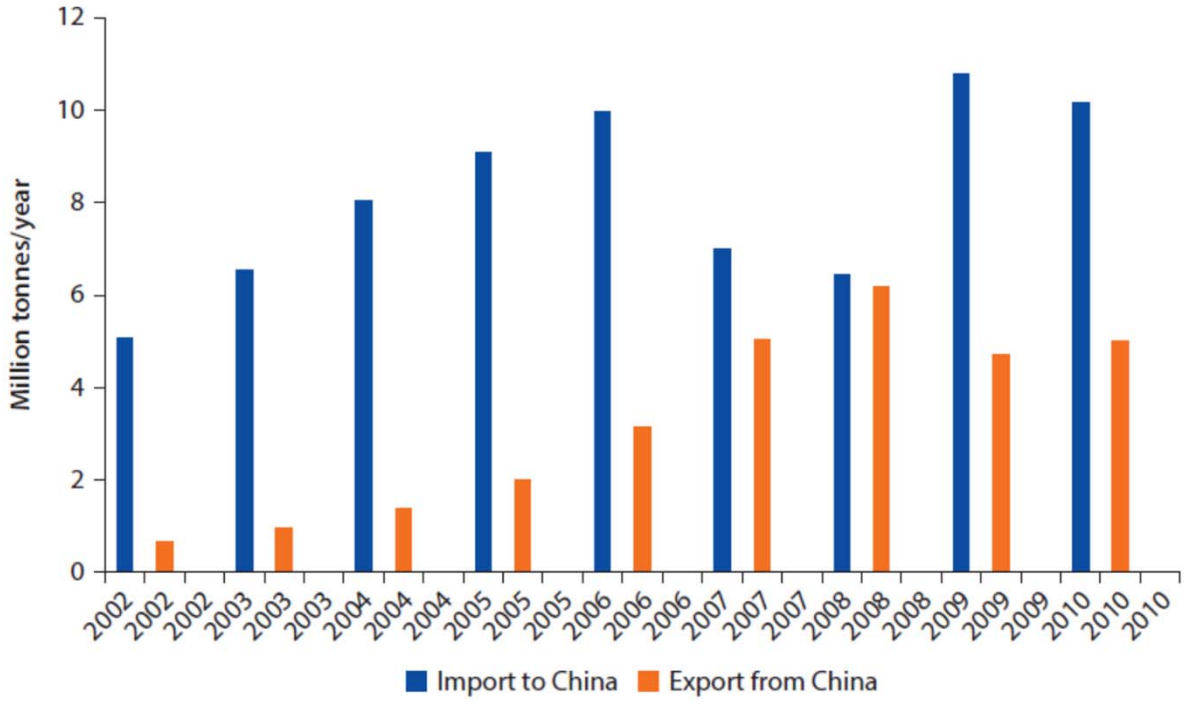


Source: Yingxiu Qi, Beijing Jiaotong University

Benefit of Belt and Road

- The perception that this is all about exporting from China is false

Figure 3.1 Railway Border Crossing Traffic at Alashankou (Kazakhstan–China Border), 2002–10



Source: Yearbook of China Transportation and Communications 2005–11.

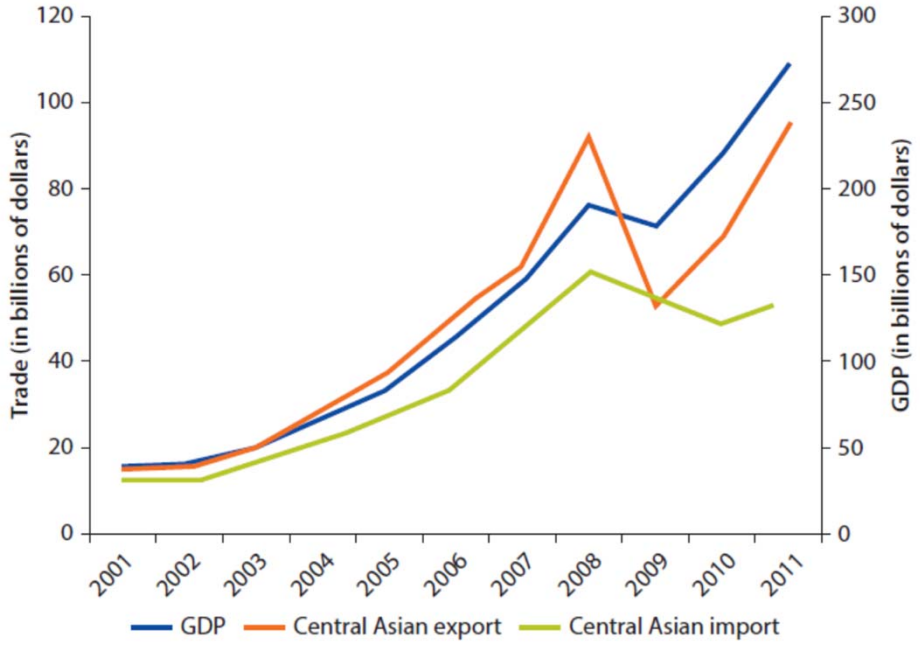
Update – Fall 2020

- Forecast growth in China
- Exports
  - 2021 +5,5%
  - 2022 +4,3%
- Imports
  - 2021 +7,1%
  - 2022 +5,6%

Side Economic Impact of Eurasian Corridor

- A railway benefits the locations it passes THROUGH as well as the end points
- Opens up Central Asia to development

Figure 1.1 Central Asian Countries: Trade Growth as a Percentage of GDP, 2001–11



Sources: IMF Direction of Trade Statistics; and World Bank, World Development Indicators.

Growth Trend

- Traffic between the EU-28 and Asia will double, 2016-2027

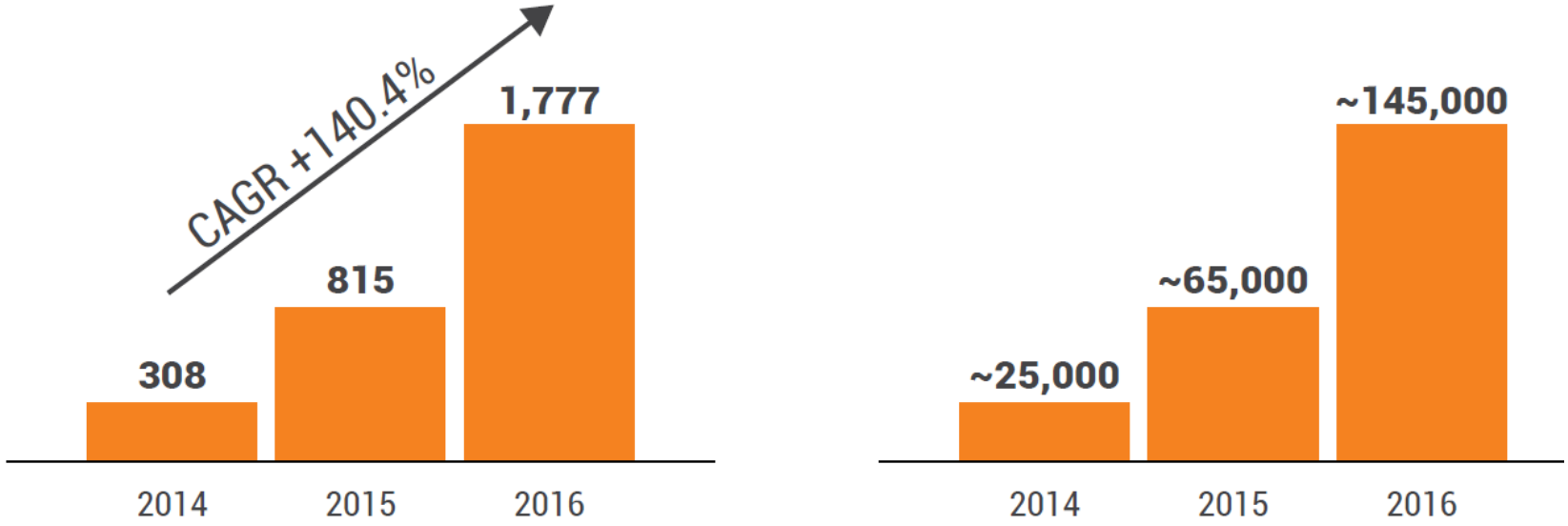


Figure 1: Development of rail freight transport between Asia and Europe from 2014 to 2016 # trains (left) and TEU (right)[3]

Berger, Roland (2017) Study – Eurasian rail corridors: what opportunities for freight stakeholders? International Union

of Railways, Paris, ISBN 978-2-7461-2653-4

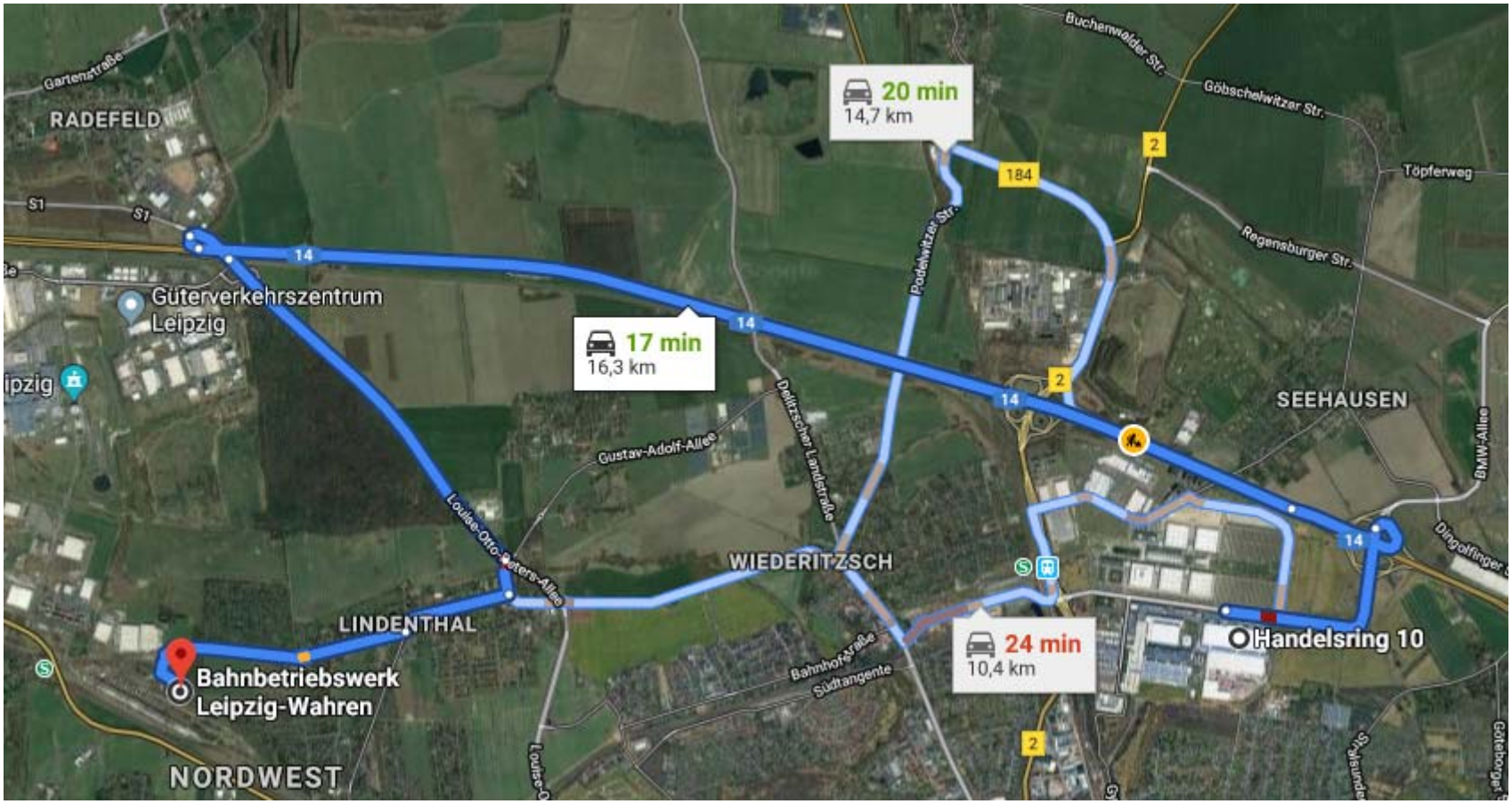
DB Schenker Logistics Center Leipzig

- A full container train leaves daily for China
- Parts for assembly of BMW cars for China market

https://youtu.be/V5LinEGBKIM

Loading Terminal for Trains to China

Already, the Journey Starts With Extra Handling



Possible Improvements

- Build a standard gauge railway through Russia
- Expand to double stack
- ”Last mile” needs to be shorter

Summary

- Rail is ideal transport for concentrated locations like logistics clusters
- The burden is still on railways to market and manage their services
- There is enormous potential for gains in sustainable operations and reduction in CO2
- Belt and Road offers benefits to all

Thank you and “vi ses”