

Euro-Asian Transport Links (EATL) workshop: 27-29 April 2009, Teheran



**“Establishing a block train:
a practical approach”**

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 Why a block train?



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Why a block train?

Single wagon load (SWL)

The client will choose single wagon load transportation when he wants to dispatch one or several wagons at the time but does not have enough quantity to fill a full train.

Block Train / Full Train

The customer will choose a block train when the quantity of his goods can fill a whole train. A block train consists therefore of goods from one shipper compared to the Single Wagon Load product which train's can have multiple shippers.

Intermodal Transport

Intermodal transportation is the movement of goods in one and the same loading unit or road vehicle, using successively two or more modes of transport without handling the goods themselves in changing modes



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Source: UIC





Why a block train?

Main Principles

- ✓ In real life, Block Trains cannot operate without Intermodal Transport
- ✓ Big Shippers can operate block trains but normally not in regular basis
- ✓ Block Trains as a service to the market (to forwarders OR to shippers) can be provided by Rail Operators or Freight Villages, in any case by NEUTRAL operators
- ✓ Block Trains as a service should be provided with specific price list, time schedule, integrated delivery service (door to door delivery), aligned to business needs



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 What are the main decisions?



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What are the main decisions?

Decision:

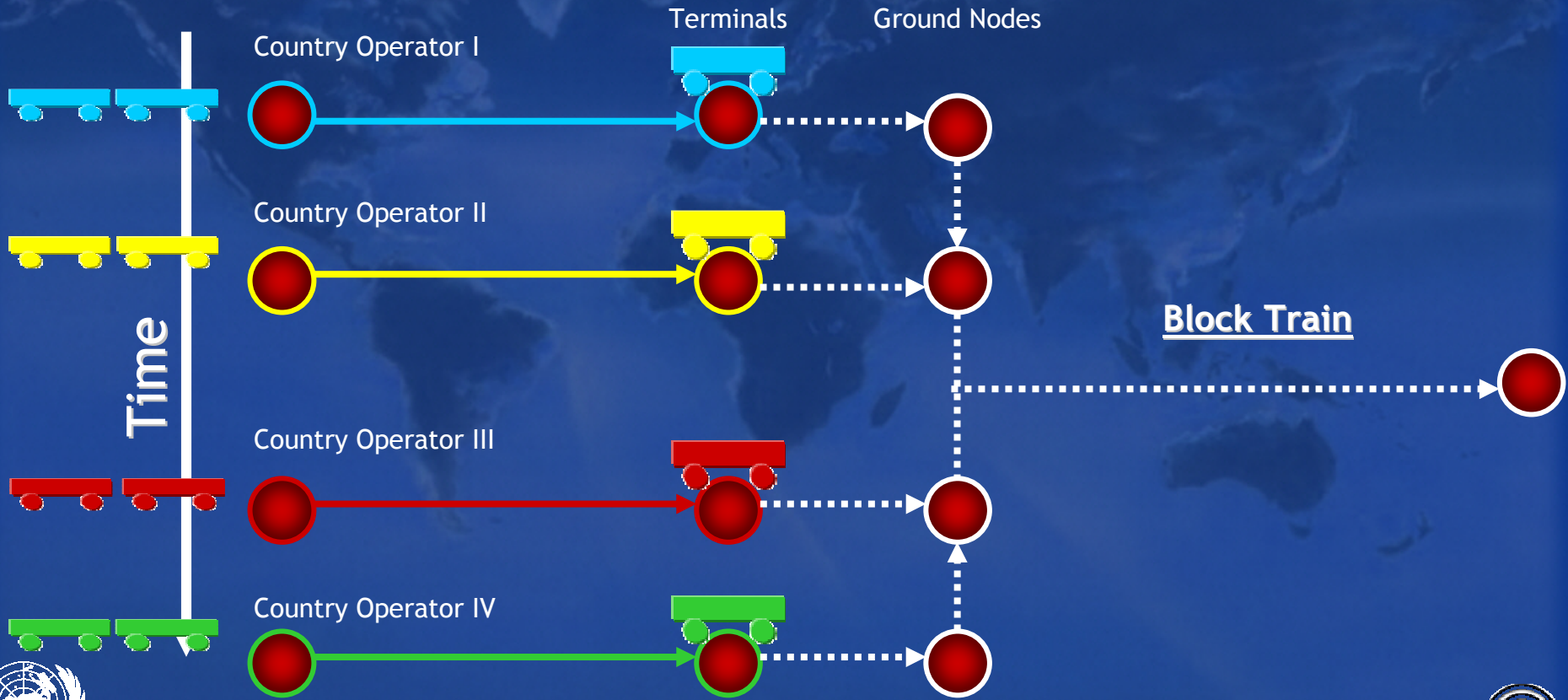
- ✓ Train origins, destinations, and routes
- ✓ Train days of operation and train times
- ✓ Train block-to-train assignment by day of the week
- ✓ Trip plans for all cars
- ✓ Locomotive assignment
- ✓ Crew assignment





What are the main decisions?

Allocation of Wagons per Country



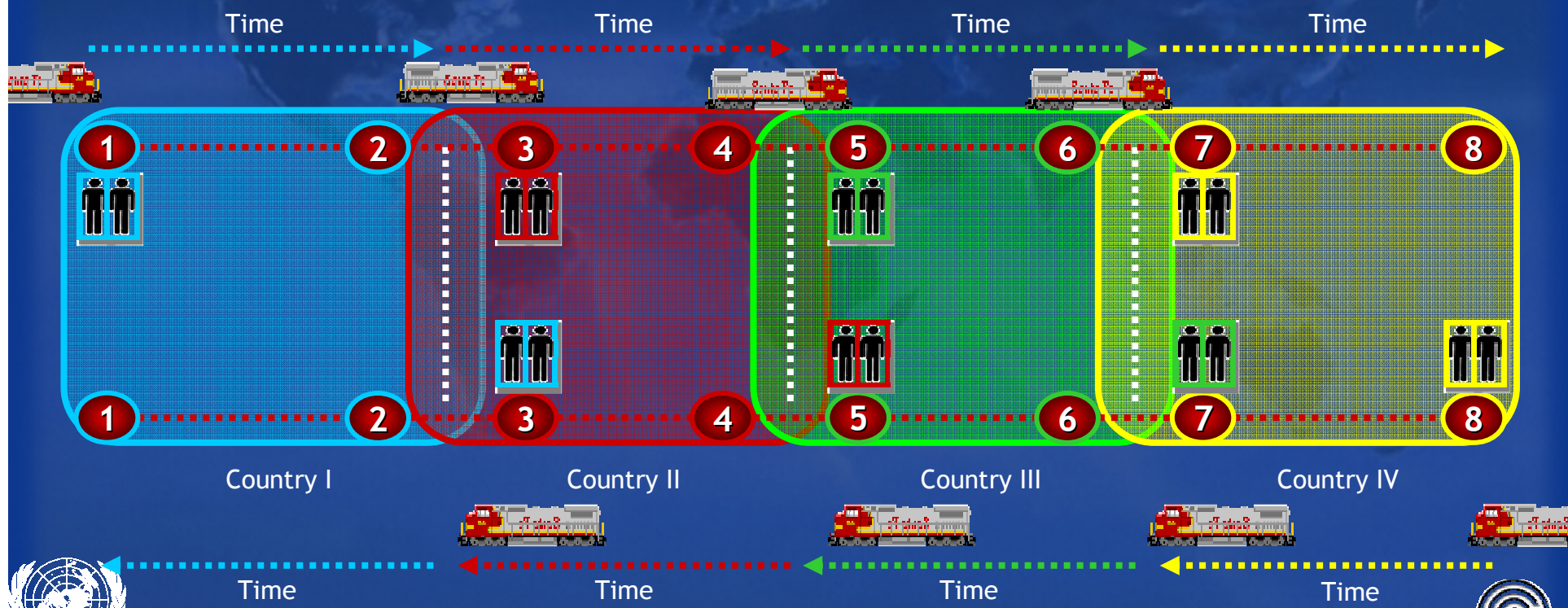
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What are the main decisions?

Crew Scheduling



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A faint world map is visible in the background of the slide, rendered in a light blue color against the dark blue background.

 What are the main constraints?



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What are the main constraints?

Yard Constraints

- ✓ Number of trains originating at any node in each given time window is limited.
- ✓ Number of trains terminating at any node in each given time window is limited.
- ✓ Number of trains passing through each node in each given time window is limited.





What are the main constraints?

Track Constraints

- ✓ Speed of a train on a track depends upon the type of train.
- ✓ Number of trains passing through any corridor in any given time window is limited.
- ✓ Satisfy headway constraints

Train Capacity Constraints

- ✓ The number of cars on any train is limited
- ✓ The length of any train is limited
- ✓ The weight-carrying capacity of any train is limited
- ✓ No more than specified number of blocks per train
- ✓ Number of stops of a train is limited





What are the main constraints?

Locomotive Constraints

- ✓ Honor locomotive minimum connection times between trains
- ✓ Provide number of locomotive based on train tonnages

Crew Constraints

- ✓ Honor crew minimum connection times between trains
- ✓ Honor crew union rules related to work and rest





The Block Train Business Model

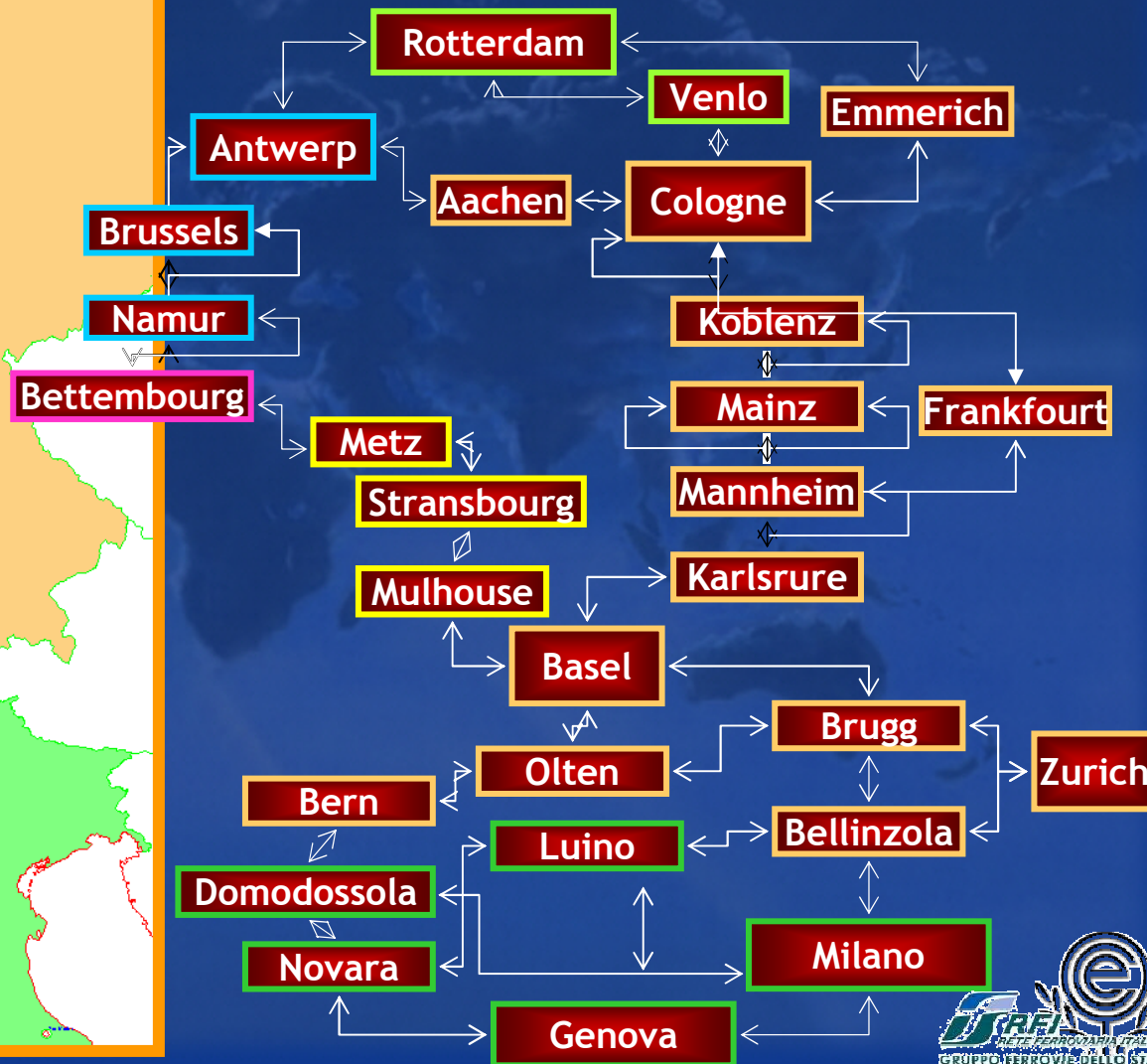
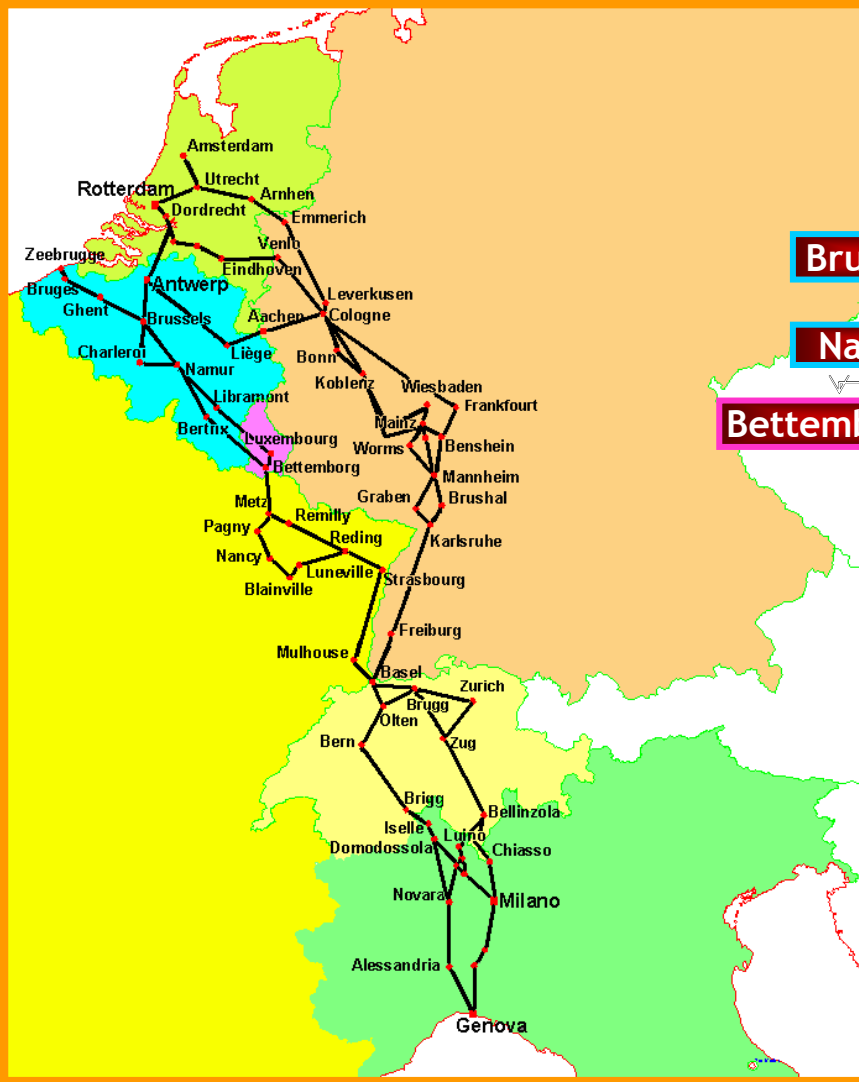


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The Block Train Business Model





The Block Train Business Model

Business Modelling Approach

Identification of strategic service

- Market analysis to identify **potential / actual demand segments**
- **Definition of the rail service characteristics** (O, D, route, type of train)
- Check of **infrastructure constraints**

Cost accounting analysis for each strategic service

- **Calculation of cost / revenues for producing the service, by actor:**
 - **Infrastructure Managers**
 - **Railway Undertakings**
 - **Terminal Operators**

Profitability assessment

- **Calculation of the revenue / cost ratio** (total and by actor)
- In case of ratio >1 , assessment of **potential traffic increase** for the same segment



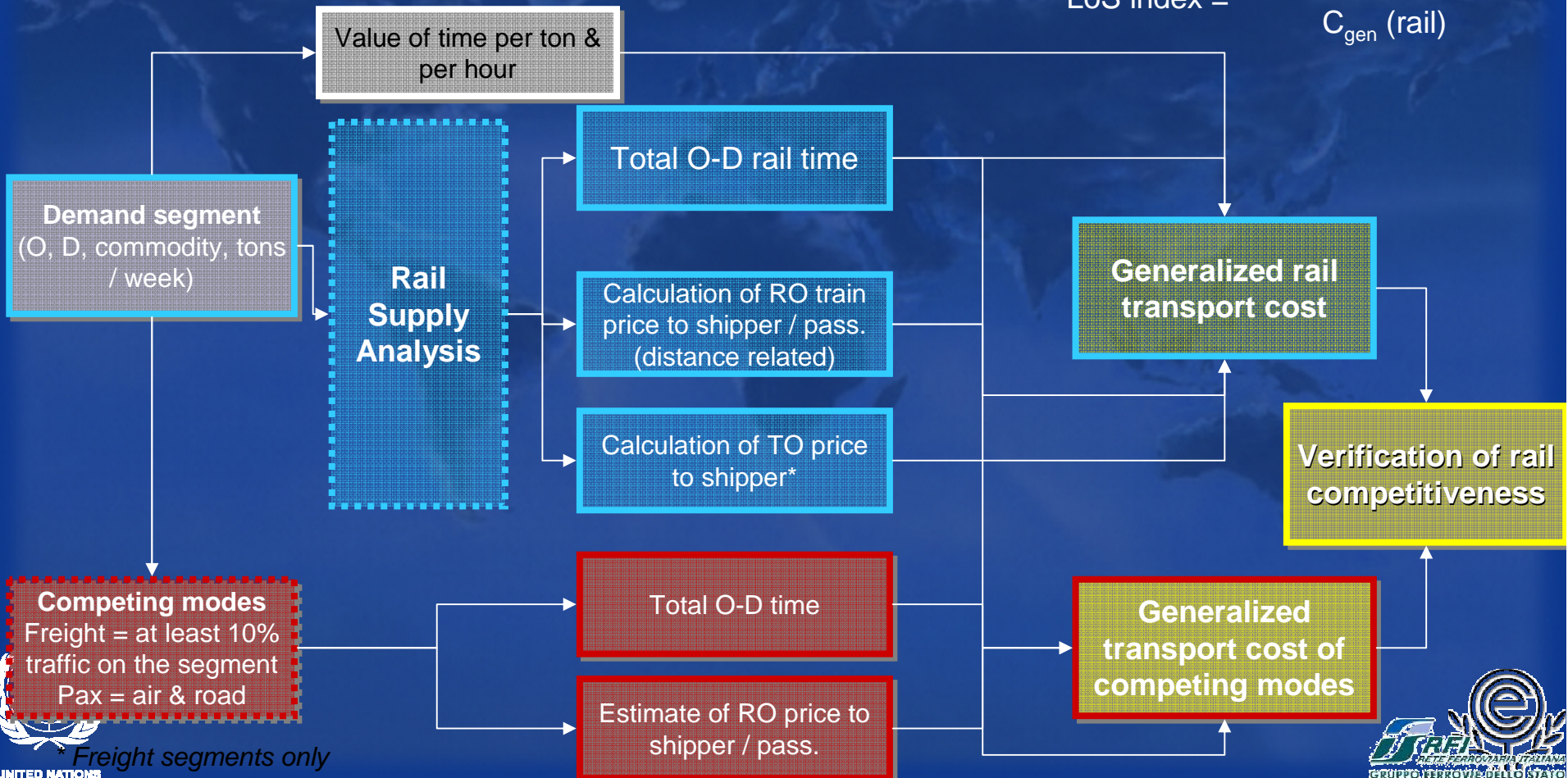


The Block Train Business Model

Comparison of level of service by mode

Estimation of the rail level of service

$$\text{LoS index} = \frac{C_{\text{gen}} (\text{other mode})}{C_{\text{gen}} (\text{rail})}$$





The Block Train Business Model

Economic data collection: drivers of rail cost / revenue



LU = Loading Unit



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Pax/ Freight	Costs		Revenues		
	Item	Driver	Item	Driver	
IM	Maintenance	€/trkm	Infrastructure charge	€/trkm	
	Renewal	€/trkm		Electricity charge	€/gross tkm
	Operational mgt	€/trkm		Public contributes	€/trkm
	Other costs	€/trkm		Other IM revenues	€/trkm
	Depreciation (paid by IM)	€/trkm			
RO	Infrastructure charge	€/trkm	Price Single Wagon	€/wagonkm	
	Electricity charge	€/ gross tkm			
	Train staff costs	€/htr	Price BT e CT	€/trainkm	
	Depreciacion	€/wagonkm			
	Maintenance	€/wagonkm	Price Pax	€/paxkm	
Other costs	%				
Terminal Operator	Final rail delivery	€/ Wagon	Final rail delivery	€/ Wagon	
	Transshipment	€/LU	Transshipment	€/ LU	
	Handling	€/ LU or €/ ton	Handling	€/ LU or €/ ton	
	Storage	€/ LU or €/ ton	Storage	€/ LU or €/ ton	
	Shunting (Marshalling)	€/ Wagon	Shunting (Marshalling)	€/ Wagon	
	Road delivery	€/ LU or €/ ton	Road delivery	€/ LU or €/ ton	





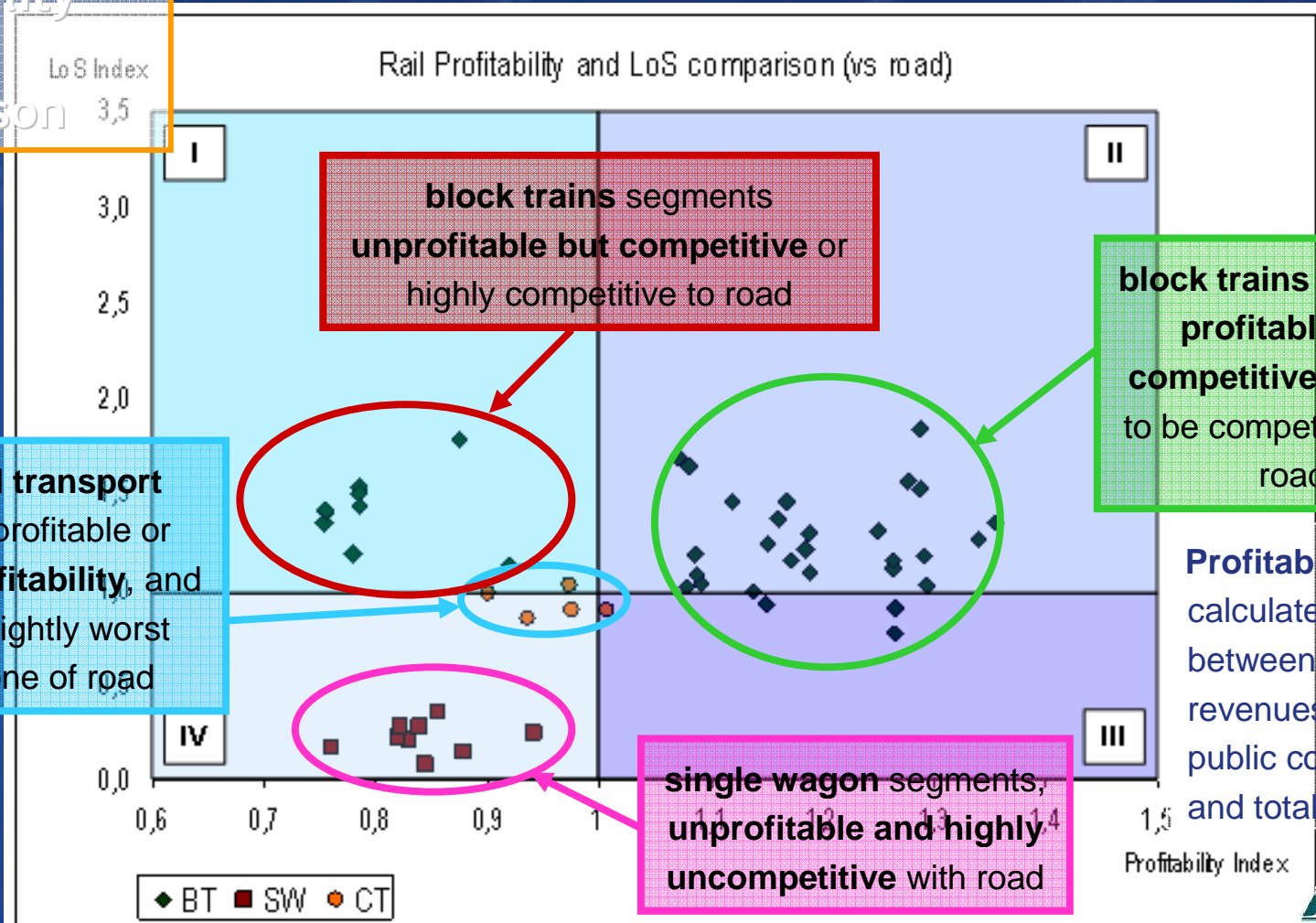
The Block Train Business Model

3. Corridor results for 2005

Profitability and LoS comparison

LoS Index 3,5

Rail Profitability and LoS comparison (vs road)



block trains segments unprofitable but competitive or highly competitive to road

block trains segments profitable and competitive (or close to be competitive) with road

combined transport segments profitable or close to profitability, and with LoS slightly worst than the one of road

single wagon segments, unprofitable and highly uncompetitive with road

Profitability is calculated as ratio between total revenues (including public contributes) and total costs.



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The Block Train Business Model

Overall results

Rail freight demand can be basically subdivided in three clusters:

1. **block trains segments** are **competitive or highly competitive** to road and IWW; most of the proposed services are profitable (all become profitable in case of averaged RU prices);
2. **combined transport** segments show approximately an **equilibrium between costs and revenues**, and a **LoS slightly worse than the road one**;
3. **single wagon** services appear to be **unprofitable** and highly **uncompetitive with road**.

Characteristics of potentially profitable segments (for which rail is competitive with other modes)

Product	Origin - Destination	
Metal products (11)	Italy-Germany (7) Germany-Switzerland (2)	France-Italy (1) Switzerland-Germany (1)
Petroleum products (5)	Germany-Switzerland (4)	Italy-Switzerland (1)
Chemicals (3)	Germany-Switzerland (1) The Netherlands-Switzerland (1)	Italy-Switzerland (1)
Building minerals & material (1)	Germany-Switzerland (1)	

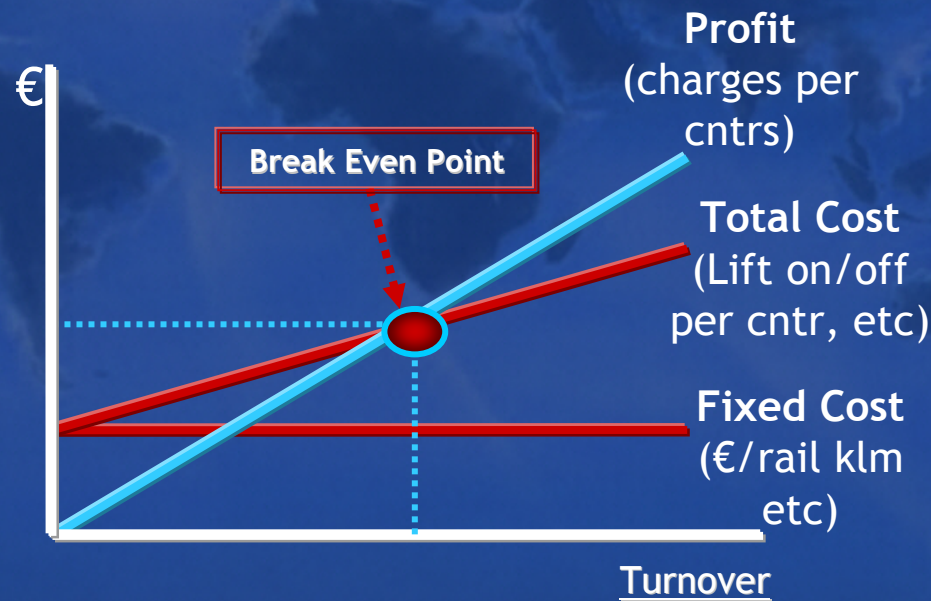




The Block Train Business Model



Block Train Profitability



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Operational Issues



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Operational Issues

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Customs and border formalities

- ✓ An essential condition for improved transit times is the speed at which customs and other border-crossing formalities can be completed.
- ✓ Given the “in-transit” nature of the goods, it is important that the customs authorities of the countries transited allow customs clearances to take place at stations of origin and destination.



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Operational Issues



Legal interoperability

- ✓ The new consignment note CIM/SMGS is consistent with the article 6 § 8 CIM and article 7 SMGS. The new document is the “sum” of the CIM and SMGS consignment notes. It is based on the United Nations Layout Key for Trade Documents;
- ✓ The third phase of the project “Transport interoperability CIM/SMGS” includes the creation of standard Eurasian transport law CIM/SMGS. Initially, one would develop a simple legal regime based on the existing CIM and SMGS rules for particular types of traffic (block trains of containers, for example) on defined transport links (along the Trans-Siberian Corridor and Corridor II between China and West European ports such as Rotterdam and Hamburg, for example).



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Operational Issues

TIR Convention

Approval of road vehicles and containers

- ✓ No goods can be removed without leaving obvious traces or breaking the Customs seal
- ✓ Customs seals can be simply and effectively affixed to them



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Operational Issues



FUNCTION OF THE TERMINAL-CHECK-IN

✓ The main purpose is to identify any possible damage to the cargo. It is a consistent, end-to-end process for transport.

Example of terminal-check-in for transport:

- ✓ Missing or damaged labels
- ✓ Load securement of freight
- ✓ Damaged or missing seals
- ✓ Open or damaged containers
- ✓ Serious damage to cargo



It is important to document any damage. The main aim is to have a clear chain of responsibility.

It is essential to

use appropriate marking.

Ensure adequate securing

at all corners.





Operational Issues



Specific Timetable

① from	④ to	⑦ Direction				⑦ Opposite direction				⑫ Profile	
		⑧ of dispatch	⑨ Closing time	⑩ Day of arrival	⑩ pick up time	of dispatch	ng time	of arrival	up time		
② Basel-Weil am R			19:00	B						C 70	C 400
③ **At Basel ar				control ar							
Bremerhafa			12:00							57	C 381
Bremerhafa			12:00							57	C 381
Bremerhafa			22:00							57	C 381
			f booking								
			f booking								
Hamburg-Bi			18:45							70	C 400
Hamburg-Bi			20:45							70	C 400
Köln-Eifelto			19:45							70	C 400

USER NOTES

- ① Dispatch terminals
- ② Dispatch terminal. German terminals are listed in alpha-

CLOSING TIME, PICK-UP TIME AND CLOSE OF BOOKING

The closing time is the time that the last loading unit is accepted by the local Kombiverkehr agency. If several customers deliver their loading units to the terminal just before the closing time, it might not be possible to process and load some of these consignments on the desired train in time. We ask that you bear this in mind when scheduling and ensure that loading units arrive in plenty of time.

to other terminals and the return journey from other terminals.

- ⑧ Days of dispatch are those days on which the transport service is operated; they are marked as 1 = Monday, 2 = Tuesday, 3 = Wednesday usw.

- ⑨ The closing time is the time at which the last loading unit is accepted at the dispatch terminal
- ⑩ The day of receipt and the pick-up time give the earliest

SPECIAL ARRANGEMENTS FOR SUNDAYS AND PUBLIC HOLIDAYS

If consignments can be shipped on a particular route on Sundays, this is indicated in the timetable. If the receiving day falls on a Sunday or public holiday, the time for collection is normally postponed to the next working day and often to a different time than on the other days of the week. If there is a Sunday or a public holiday between the shipping date and the date of receipt, transportation may take longer. Precise details of such timetable variations and special rules for public holidays and holiday periods can be found under:

to outward and return journeys. You will find an overview on page 7.





 Case Study A.T.I Block Train



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Container Block Trains to Central Asia

Since 22nd June 2002, there exists a regular weekly container block train between Tehran, Tashkent and Almaty. The train covers a total distance of 6722 km, crossing Iran and Uzbekistan with the transshipment of containers at the border station Sarakhs, Turkmenistan. The maximum train length is 420 m and the maximum number of containers carried per train is 20: these are 40 feet long ISO containers with maximum gross weight of 32 tonnes. The journey lasts 12 days.

The containers are not possible. Transfers between Turkey and Iran.

So far, 1035 containers to Turkmenistan, 28 to T.

On 26th December 2003, another weekly container block train was inaugurated between Haydarpaşa and Sarakhs at the Iran -Turkmenistan border. So far 610 containers have been carried on this transport route.

All containers transported by TCDD must be provided by the shipper, as TCDD does not own or operate containers. While the transport of these containers can be tracked and traced on Iranian networks, the other railways involved cannot provide such information. In addition it seems to be extremely difficult to obtain cargo for the westward journeys.

**30% Profit on the
6.000\$ = 7.800\$
cost to the shipper**

$$6.722\text{km} \times 13,9\text{€} \\ (16.68\$) = 112.122\$$$

$$112.122\$ / 20 \text{ cntrs} = \\ 5.606\$ \text{ per cntr}$$

$$\text{Cost of Lift on / off} \\ \approx 50\$ \text{ per cntr}$$

$$\text{Other costs (customs} \\ \text{formalities, etc)} 200\$$$

$$\text{Appr. Total cost} \\ 6.000\$$$

Source: ITF Peer Review for Turkey





Case Study



Additional Info

✓ Turkish freight forwarders for container transport, they use mainly the route Istanbul - Black Sea - Rostov (Russian Fed.) and then by rail to Almaty or Tashkent. Time: 30 days : Cost: 7.000 USD. Used containers are bought by Turkish freight forwarders (1.000-1.500 USD) and, upon arrival, are sold on the Central Asian market

Rail

Intermodal

Time
12 days

Cost
7.800 USD

Time
30 days

Cost
7.000 USD





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Rostov



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What is really missing?

- ✓ Strategy and strategic objectives of the rail service
- ✓ An integrated (the service)
- ✓ A Neutral (the service)
- ✓ Door to door
- ✓ Simplified
- ✓ A single l

**Almaty - Tehran - Istanbul
Block Train**



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Thank You!



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Almaty - Tehran - Istanbul Block Train



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In talking to Turkish freight forwarders active in transport to and from Central Asia I got the following information :

The Istanbul-Almaty train is, apart from some trials, still a virtual and political train. Apart from virtually getting no return cargo, except to Bandar Abbas (cotton), but this requires special waggons, the return of the empty wagons (rail boogies are changed at Sarakhs) is a costly and a general problem (when do they come back?) as there is no cross border information system in place (except between Iran and Turkey). When I asked why it was not considered to provide for vertical transshipment of the containers only at Sarakhs to avoid axle change and search for waggons, I was told this had been so (politically?) decided. Also at the Turkish Van lake, considerable delays seem to occur due to lack of ferry equipment and “mismanagement”. Also containers never return from Central Asia (too expensive to carry empty units).

Turkish freight forwarders do not operate on the TRACECA corridor (too complicated - no permits, corruption and too expensive). For container transport, they use mainly the route Istanbul - Black Sea - Rostov (Russian Fed.) and then by rail to Almaty or Tashkent. Time: 30 days: Cost: 7.000 USD. Used containers are bought by Turkish freight forwarders (1.000-1.500 USD) and, upon arrival, are sold on the Central Asian market (for how much: no answer, but there is used container demand for storage, etc. in Central Asia).

Time sensitive cargo, mainly for Turkish construction sites in Central Asia, all goes by truck via Iran. Also here there is hardly any return cargo. Time: 15 days. Cost: 10.000 USD.



The EATL Rail Route 4 provides an alternative link between South-Eastern Europe and the Lianyungang and Shanghai ports, passing through Bulgaria, Turkey, Iran, Uzbekistan and Kazakhstan. It provides an extension to PETCs IV, VIII, X and the TRACECA route to the Chinese seaboard, also with parts of the route belonging to the TAR network. There are two limitations to that route: there are two gauge changes (Iran-Turkmen border and the Kazakh-Chinese border) and large sections of Route 4 have not been electrified. In principle, Route 4 could become a major artery for container shipments between Europe and China. In practice, only limited quantities (one container train per week) move between Turkey and Central Asia.



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Dragoman - Sofia - Svilengrad - Kapikule - Istanbul -
Haydarpasa (Port) - Izmit - (Derince Port) - Ankara - Malatya -
Kapikoye - Razi - Qazvin - Tehran - Sarakhs - Sarahs - Mary -
Chardzou - Navoi - Tashkent - Shymkent - Almaty - Dostyk -
Alataw Shankou - Lianyungang (Port)/Shanghai (Port)

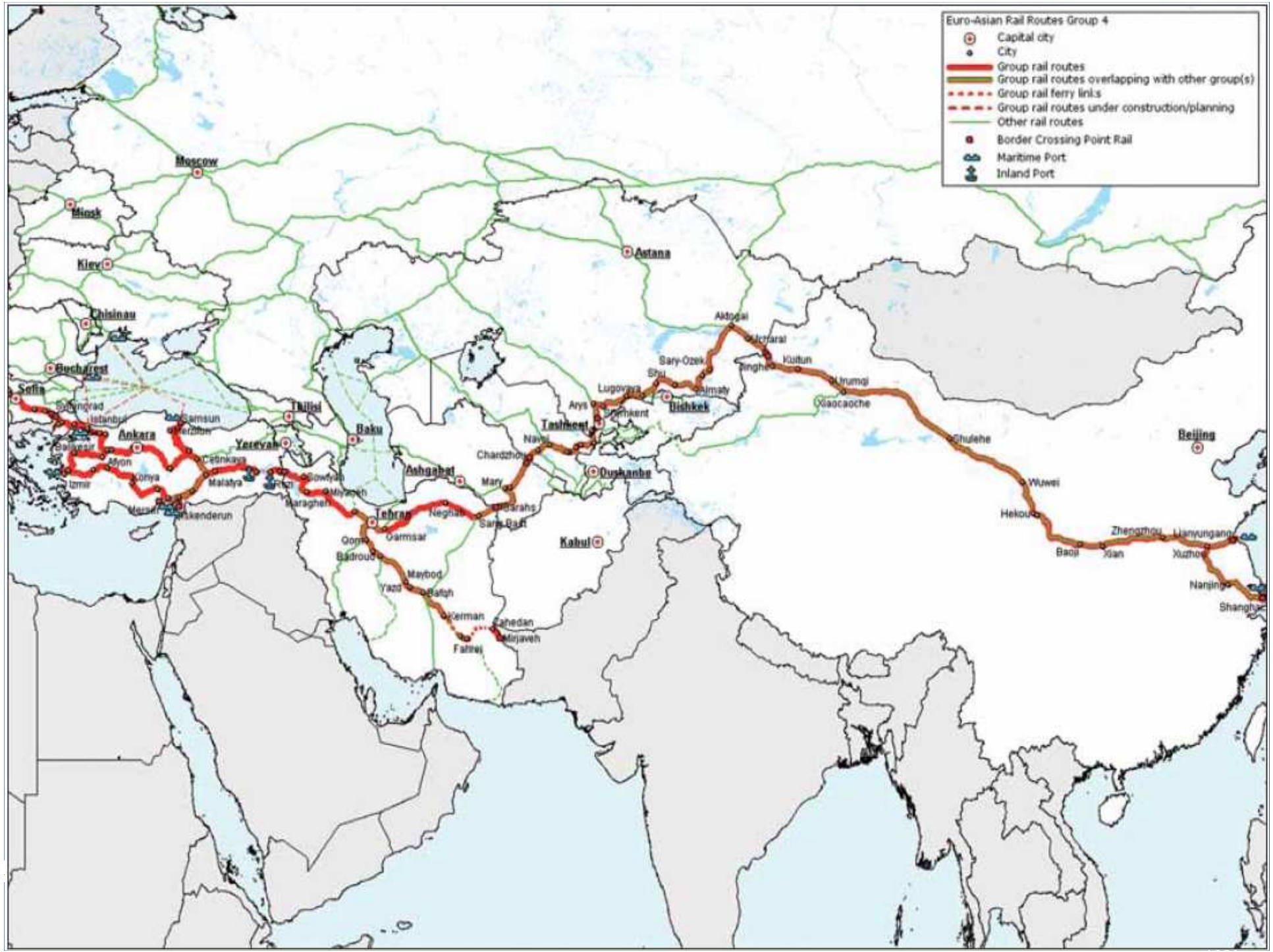


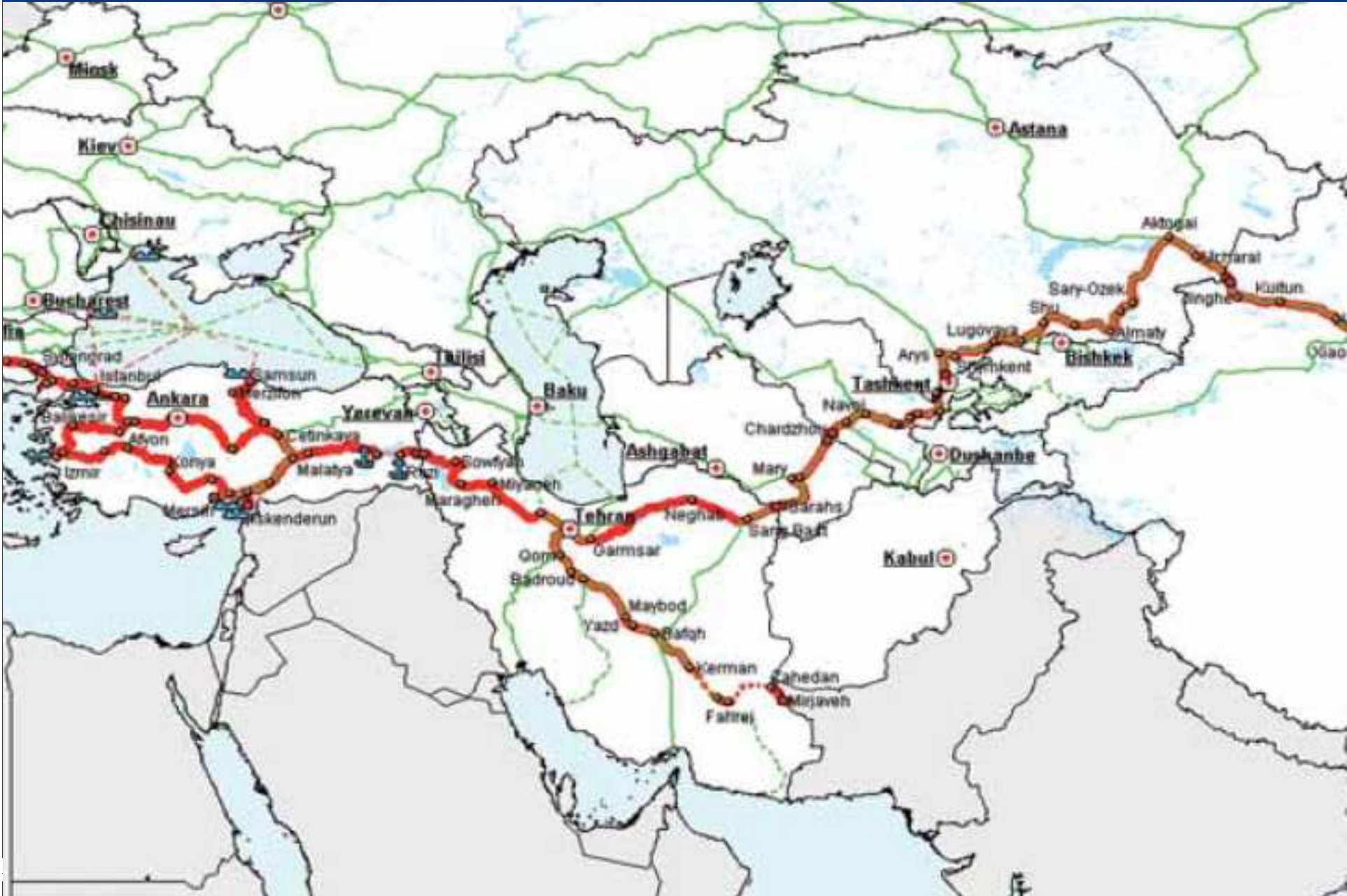
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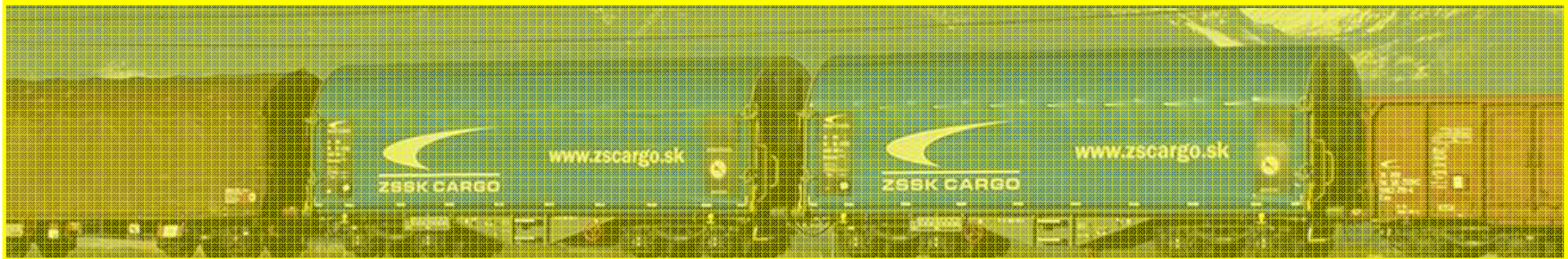
Euro-Asian Rail Routes Group 4

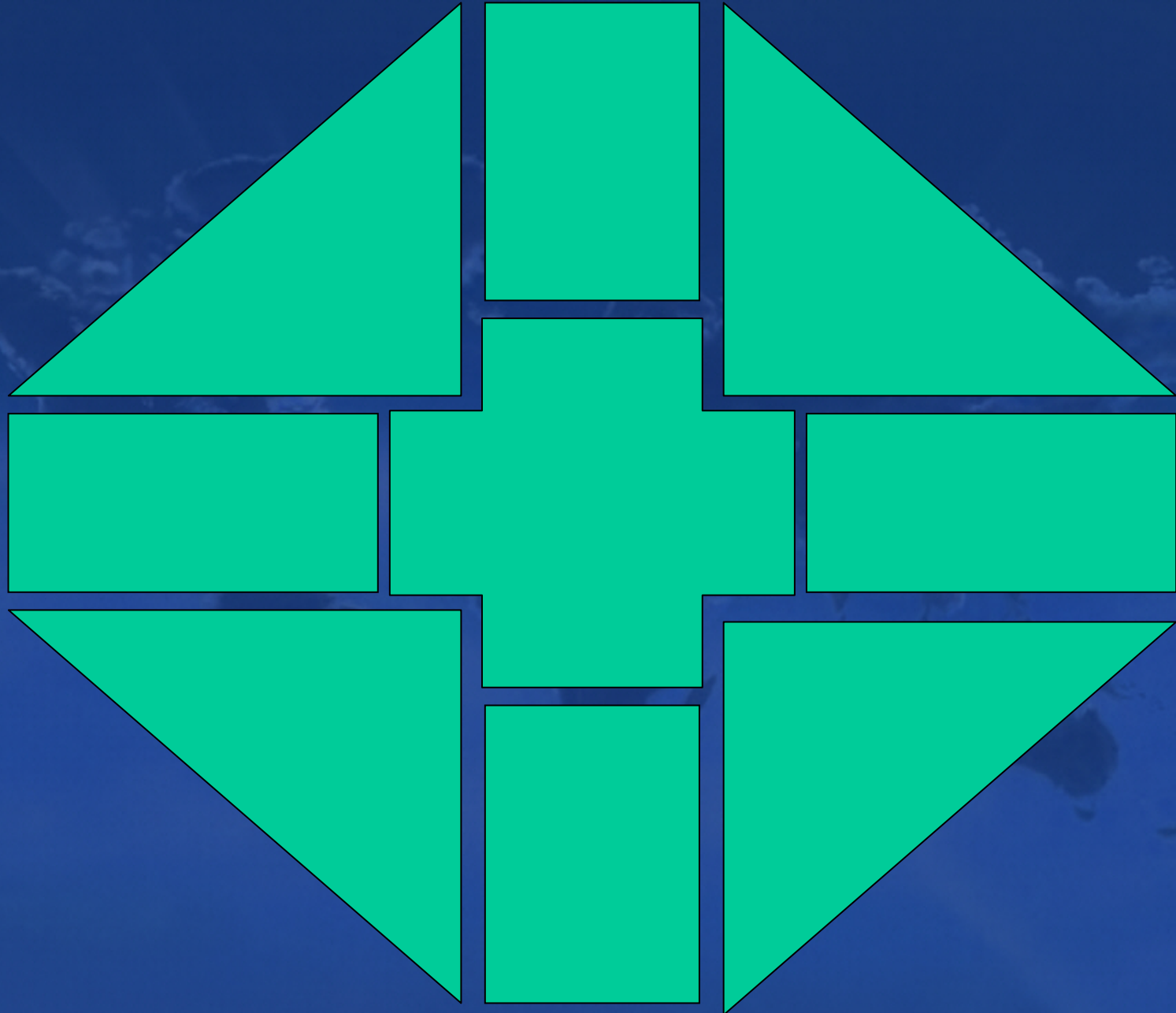
- Capital city
- City
- Group rail routes
- Group rail routes overlapping with other group(s)
- - - Group rail ferry links
- - - Group rail routes under construction/planning
- Other rail routes
- Border Crossing Point Rail
- Maritime Port
- Inland Port











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