
DBS Gateway Region WP5 - Towards Implementation Pilot Action



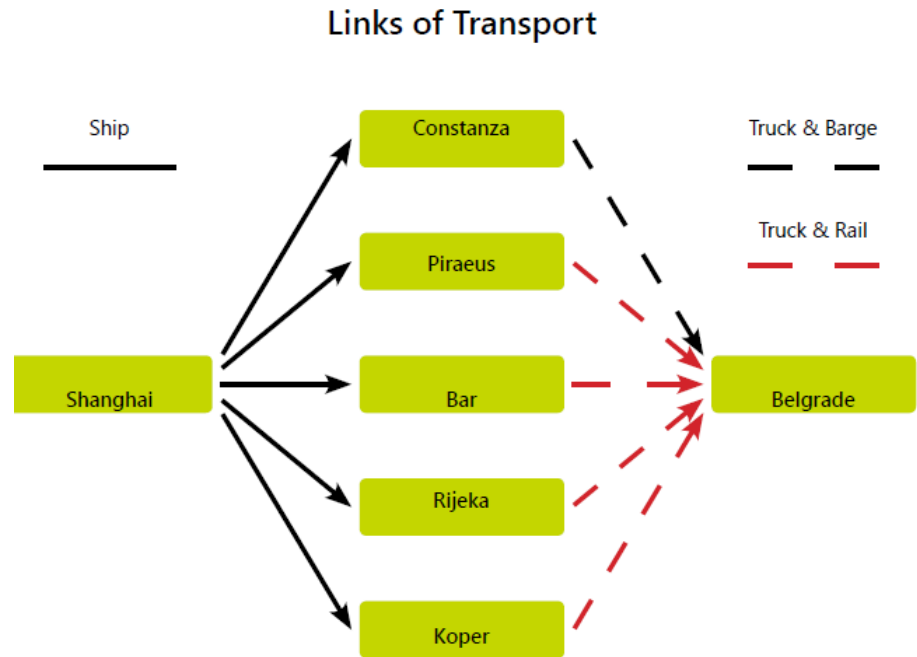
Krems, 13th of June 2019

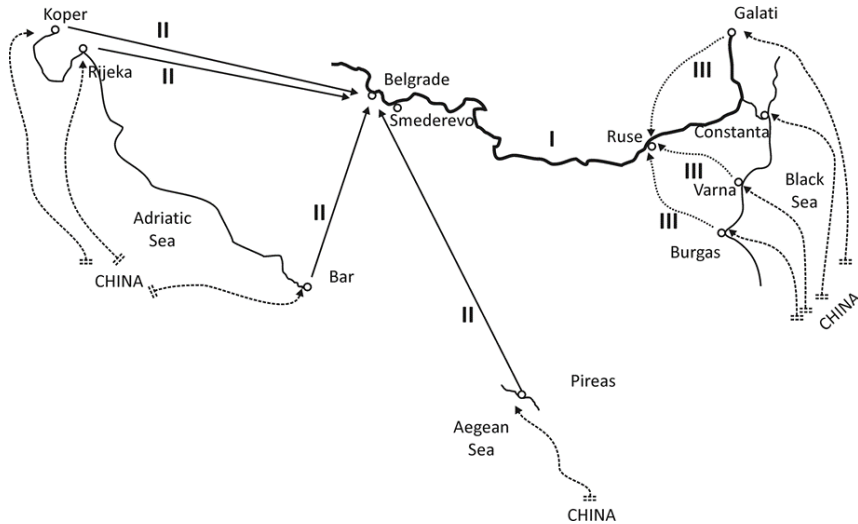
- WP5 faced the challenge that implementation often lags behind recommendations in regional Roadmaps/Action Plans.
- The Pilot Action gathered relevant data related to the existing potentials and obstacles for increasing the attractiveness of the waterway transport system in the DBS Gateway Region.



The pilot action included two steps:

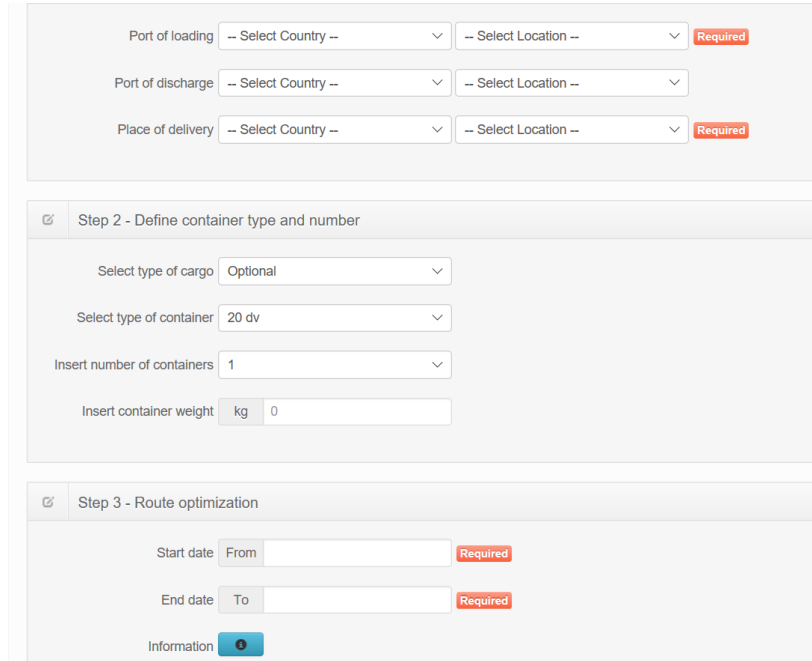
1. Tracking and tracing of cargo from China to Serbia, via the Port of Constanta and the Danube River, with an aim of gathering all relevant transport data, as well as collecting all relevant data from logistic service providers for other alternative routes, China to Serbia via ports: Koper, Rijeka, Bar and Piraeus;





Including Route Inventory Survey of the transport conditions and potential backups for the routes: Galati – Novi Sad, Varna – Novi Sad, Burgas – Novi Sad. On all of these routes, from the Port of Ruse/Giurgiu to Novi Sad, the IWT on the Danube was considered (including backup routes in the case of unfavourable navigational conditions), while from the Black sea ports to the Port of Ruse/Giurgiu road and rail transport routes were analysed.

2. Development of an open source web-application that is using the multi-criteria decision making (three criteria: price, time, emissions) in order to compare different available intermodal transport routes from an origin to a destination of cargo flows, considering different types of containers and more potential shippers, and to suggest an optimal solution for the given criteria.



The screenshot shows a web application interface with three main sections:

- Port of loading**: A dropdown menu with "-- Select Country --" and a "Required" label.
- Port of discharge**: A dropdown menu with "-- Select Country --" and a "Required" label.
- Place of delivery**: A dropdown menu with "-- Select Country --" and a "Required" label.

Step 2 - Define container type and number

- Select type of cargo**: A dropdown menu with "Optional".
- Select type of container**: A dropdown menu with "20 dv".
- Insert number of containers**: A dropdown menu with "1".
- Insert container weight**: A text input field with "kg" and "0".

Step 3 - Route optimization

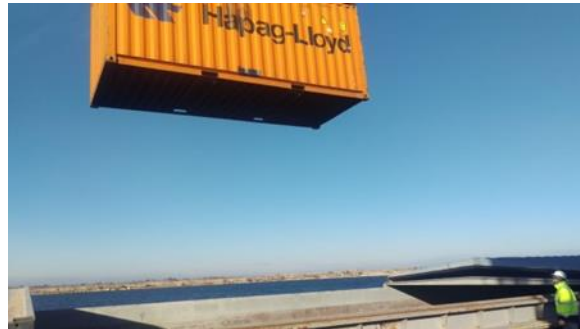
- Start date**: A text input field with "From" and a "Required" label.
- End date**: A text input field with "To" and a "Required" label.
- Information**: A blue button with an "i" icon.

Route China - Serbia via Constanta

Client: Strukturcom doo
Container: HLBU1731637
Container seal: HLB5176091
Container type: 20 db
Port of loading: Shanghai
Port of discharge: Constanta
Final destination: Belgrade via Port of Smederevo
Container stuffing: 15/11/2018
Vessel departure: 23/11/2018
Vessel arrival to Constanta: 31/12/2018
Container on a barge: 15/01/2019
Container in Smederevo: 27/01/2019
Container in Belgrade: 27/01/2019



Total transport time: 65 days
Total SC costs (FOB): 3915 EUR



Main conclusion from the tracing of the container on the route Shanghai – Belgrade via Constanta - unsatisfying transport time and transport costs due to:

- NOT COMPETITIVE OCEAN FREIGHT COSTS TO CONSTANTA
- NOT COMPETITIVE PORT COSTS
- NON EXISTANCE OF THE LINE SERVICE
- LONGER TRANSPORT TIMES
- ORGANIZATION OF TRANSPORT OF JUST ONE CONTAINER
- ENGAGEMENT OF ONE CAPTAIN DURING TRANSPORT ON IWT

Alternative routes

Ocean freight costs for
 TEU from Shanghai to
 the selected ports

20 FT	CONSTANTA	PIRAEUS	BAR	RIJEKA	KOPER
MAERSK	1300 \$	1175 \$	/	1283 \$	1283 \$
MSC	1183 \$	1267 \$	1267 \$	1133 \$	1133 \$
CMA – CGM	1188 \$	1367 \$	1650 \$	1250 \$	1250 \$
HAPAG LLOYD	1299 \$	1711 \$	1931 \$	1310 \$	1310 \$
EVERGREEN	1650 \$	1283 \$	/	1196 \$	1196 \$
COSCO	1185 \$	1379 \$	/	1200 \$	1200 \$

TEU handling costs at
 the selected ports

20 FT	CONSTANTA	PIRAEUS	BAR	RIJEKA	KOPER
MAERSK	250€	240 €	/	200 €	200 €
MSC	250€	240 €	280 €	227 €	227 €
CMA - CGM	250€	240 €	210 €	210 €	210 €
HAPAG LLOYD	250€	240 €	250 €	200 €	200 €
EVERGREEN	250€	240 €	/	196 €	196 €
COSCO	250€	240 €	/	195 €	195 €

Land transport costs per
 TEU from the selected
 ports to Belgrade

40 FT	CONSTANTA	PIRAEUS	BAR	RIJEKA	KOPER
ROAD	1750€	1930 €	590 €	690 €	790 €
RAIL	/	950 €	705 €	660 €	920 €
IWT	570€	/	/	/	/

Transport time from Shanghai to selected ports

SHANGHAI-	RIJEKA	KOPER	BAR	PIRAEUS	CONSTANTA
MAERSK	32	30	/	32	29
MSC	31	34	33	31	38
CMA - CGM	32	30	34 / 37	34 / 35	29
COSCO	29 / 27 / 31	30 / 28 / 32	/	31 / 29 / 26	30
EVERGREEN	35	33	/	45 / 26 / 31	31 / 36
HAPAG LLOYD	31 / 33	32 / 34	/	29 / 34	34 / 36

Transport time from the selected ports to Belgrade

20 DV/40 DV/40 HQ	CONSTANTA	PIRAEUS	BAR	RIJEKA	KOPER
ROAD	3 days	2 days	2 days	2 days	2 days
RAIL	/	7 days	5days	4 days	5 days
IWT	12 days	/	/	/	/

CO2 emissions for different transport modes

TYPE OF TRANSPORT	kg CO ₂ / TEU
ROAD	0,72
RAIL	0,205
IWT	0,084
CONTAINER OCEAN SHIP	0,084

Multi-criteria decision making - three selected criteria:

- transit time,
- transport costs and
- carbon dioxide emissions.

Different types of containers: (20ft, 40ft and 40ft hc).

Various service providers on each segment of the SC.

Tested for 7 different scenarios considering three selected criteria

Starting point: China - Port of Shanghai;

Transshipment ports in Europe: Rijeka, Bar, Koper, Piraeus, and Constanta

End point: Serbia - Belgrade

Scenario 1 – Optimisation of costs:

For all three types of containers the port of discharge was the Port of Constanta; transportation to Belgrade by barge.

- ▶ 20ft: EUR 1,594
- ▶ 40ft: EUR 2,470
- ▶ 40ft hc: EUR 2,483

Scenario 2 – Optimisation of time:

The optimal transit time between Shanghai and Belgrade is 29 days via Piraeus, a maritime feeder service to Rijeka and by truck to Belgrade.

- ▶ transit time between Shanghai and Piraeus - 22 days
- ▶ waiting time (for feeder to Rijeka) in Piraeus - 2 days
- ▶ transit time from Piraeus to Rijeka - 3 days
- ▶ waiting time in Port of Rijeka - 1 day
- ▶ transit time from Rijeka to

Scenario 3 – Optimisation of CO₂ emissions:

The minimum approximation of CO₂ emissions from Shanghai to Belgrade is 1,405.91 kg CO₂/TEU to the Port of Constanta and barge service to the Port of Belgrade.

Scenario 4 – Optimisation of costs and time:

For the iteration the best solution was selected, in order to calculate the 40ft hc container, an equal weighting of the criteria was used. The best solution is the transshipment at Piraeus continuing by maritime feeder service to Rijeka and the final leg by truck to Belgrade. The optimal transit time resulted in 29 days at costs of EUR 2,634.

Scenario 5 – Optimisation of costs and CO₂ emissions:

For the first iteration an equal weighting of the criteria was made, while in the second the best solution was selected. The results for the route Shanghai – Constanta - Belgrade are costs of EUR 1,590 at emissions of 1,405.91 kg CO₂/TEU.

Scenario 6 – Optimisation of time and CO₂ emissions:

For the first iteration an equal weighting of the criteria was carried out, while for the second one was selected as the best solution. The best solution is the transshipment at Piraeus continuing by maritime feeder service to Rijeka and the final leg by truck to Belgrade. The optimal transit time resulted in 29 days at emissions of 1,596.7 kg CO₂/TEU.

Scenario 7 - costs, time and CO₂ emissions:

For the first iteration an equal weighting of criteria was made, while in the second it was selected the best solution. The best solution is the transshipment at Piraeus continuing by maritime feeder service to Rijeka and the final leg by rail to Belgrade. The optimal transit time resulted in 31 days at emissions of 1,515.56 kg CO₂/TEU and costs of EUR 1,657.

Thank you for your attention!

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