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Executive summary

Transport infrastructure assessed in this report comprises the basic physical facilities and installations necessary for the operation of road, rail, inland waterways and maritime transport. Infrastructure therefore includes physical networks, terminals and intermodal nodes.

Each participating project partner covered transport infrastructure in their respective countries. The report contains not all transport infrastructure of all modes, but only selected nodes (ports and terminals) and selected rail and road sections of the transport network relevant for the proper functioning of the selected nodes.

Apart from having the fundamental importance for proper development of the entire inland waterway transport system, ports and their hinterland connections are crucial for the competitiveness of the region they serve. In this view, port competitiveness is increasingly influenced by the process of developing trade corridors with the hinterland. The overall objective is to integrate the port system in a multimodal transportation network in order to improve market access, seamless trade and the integration in global supply chains. In this context, seaports, in the first place, must have interfaces between major maritime trade and economic activities of ports and inland terminals within or outside of inland waterways ports that provide multimodal facilities and connections between the forelands and hinterlands. Consequently, inland waterways ports must also be connected with their hinterland with good quality and efficient transport infrastructure, namely road and rail infrastructure.

In this view, the status quo and basic characteristics of operating infrastructure of the ports of Enns, Vienna, Bratislava, Komarno, Dunaújváros, Budapest, Baja, Vukovar, Bogojevo, Bačka Palanka, Prahovo, Drobeta Turnu Severin, Vidin, Ruse, Giugiu, Galati, Constanta, Giurgiulesti, Izmail and Reni were analysed in this report.

Apart from the assessment of port infrastructure status quo, the report contains relevant assessment of road and rail sections of importance for the overall functioning of the inland waterway transportation system in relevant countries of the Danube Region, including the seamless function of analysed ports, as well as basic overview of multimodal terminals outside aforementioned ports.

Road and railway sections of importance for the overall integration of Danube IWT and ports into intermodal transport chains were analysed on the basis of their current conditions, technically described in a determined number of suitable key performance indicators.

The report also contains a brief analysis of existing multimodal terminals outside of selected ports, in order to properly assess the wider scope of multimodal infrastructure representing the supply side in intermodal transport chains in the Danube region.

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3 Abbreviations

Abbreviation	Explanation
IWT	Inland waterways transportation
CCT	Container cargo terminal

4 Introduction

4.1 Scope of the report

This report delivers a detailed analysis of the existing infrastructure situation in the DR for all transport modes. It provides an insight into transport infrastructure on the selected sections and nodes of transport corridors in the DR classified as relevant for the integration of the Danube waterway transport system. Particular attention is given to infrastructure and core superstructure in the Danube river and seaports as well as to the multimodal facilities. Another focus point is the current accessibility of Danube ports by connecting rail and road networks. Infrastructure service levels of these port hinterland connections will be investigated for selected Core network ports as well as for selected Comprehensive Network ports with dedicated economic development potential. The report uses existing databases such as corridor development studies, information collected from national statistics and other databases. In addition, expert interviews were carried out, and implementing partners contributed to the data collection.

Following transport infrastructure assets were analysed in the report:

Country	Ports	Rail sections	Road sections	Rail-road terminals
AT	Enns Vienna	Linz-Wien Meidling	A1 Linz-Steinhäusl A4 Ostautobahn	Linz Stadthafen CCT Wels Vbf CCT Port of Krems Vienna Freudenau
SK	Bratislava Komarno	Bratislava – Kúty Bratislava – Leopoldov Bratislava - Petržalka Bratislava – Dunajská Streda - Komárno	Brodské – Čunovo Bratislava Žilina	Metrans Dunajská Streda

Country	Ports	Rail sections	Road sections	Rail-road terminals
HU	Budapest Dunaujvaros Baja	Dombóvár – Pusztaszabolcs Budapest Kelenföld – Budapest Ferencváros Budapest Ferencváros – Cegléd	Nagytétény – Némedisződ Budapest – Kecskemét Bátaszék – Budapest	BILK Budapest
HR	Vukovar	Vinkovci – Vukovar	Bregana – Zagreb – Slavonski Brod - Bajakovo	
RS	Bogojevo Bačka Palanka Prahovo	Bogojevo – Erdut Bogojevo – Kelebija Crveni krst – Zaječar – Prahovo pristanište	Bogojevo – Erdut Bogojevo – Kelebija (HU border) Bačka Palanka – Srpska Crnja – border with RO Bačka Palanka – Croatia Prahovo – Romania	NELT Dobanovci ŽIT Beograd
RO	Drobeta Turnu Severin Giurgiu Galati Constanta	Constanta – Bucharest – Arad – Curtici Bucharest – Galati port Bucharest – Craiova – Drobeta Turnu Severin – Arad – Curtici Bucharest – Giurgiu port Craiova – Calafat port Bucharest – Pașcani – Siret	Constanta – București – Oradea – Borș Bucharest – Galati Bucharest – Craiova – Drobeta Turnu Severin – Timișoara - Cenad București – Giurgiu Craiova – Calafat Bucharest – Pascani – Siret	---

Country	Ports	Rail sections	Road sections	Rail-road terminals
BG	Lom Ruse	Mezdra – Vidin Ruse – Gornya Oryahovitsa Ruse – Kaspichan	Vidin – Kulata Ruse – Makaza Ruse – Varna	Ruse – Tovarna
MD	Giurgiulesti	Giurgiulesti – Basarabeasca Giurgiulesti – Cahul Giurgulesti – Galat	Kishinev – Giurgiulesti	---
UA	Reni Izmail	Odesa – Izmail Reni – Galati Reni - Etulia	Odesa – Izmail – Reni	Orlovka

Table 1: Transport infrastructure assets analysed in the report

Figure 1: Major transport infrastructure in the Danube Region (all modes)

5 Transport infrastructure status quo in Austria

5.1 Ports

5.1.1 Port of Enns

5.1.1.1 Position

Ennshafen port is located on river km 2112 in the mouth of river Enns to the Danube at the border between the federal states of Upper Austria and Lower Austria. With 352 ha Ennshafen port is the largest connected industrial area on the upper Danube, it is a combination of business park areas and port areas in close connection.

The Ennshafen port offers optimal trimodal transportation logistics for export and connects the entire region with international transportation network. Roundabout 62 companies with together ca. 2600 employees represent the whole conglomerate at present.

Figure 2: Ennshafen port

Ennshafen is one of two TEN-T-core ports (Rhine-Danube corridor waterway) in Austria.

It benefits from a central location in Austria and indeed Europe, with direct access to the Trans-European Transport Network. It guarantees ideal conditions thanks to an efficient infrastructure, roads, quays, and railway systems.

Overview of basic port's features are given in the below table.

Parameters	Explanation / Value
Port land owner (State, Region, Municipality, Private, Other)	region + private
Port authority name	Ennshafen OÖ GmbH + Ennshafen NÖ GmbH
Number of operators (concessionaires, lessors)	10
Total port area (ha)	352
Maximum draught (m) - natural or dredged	2,7
Total number of terminals	7
Heavy lift and out-of-gauge handling capacity (Yes/No)	yes
Ability to handle full block train along the quay (Yes/No)	yes
Ability to handle full block train in the port area (Yes/No)	yes
Transhipment equipment for intermodal transport (Yes/No)	yes
Total quay length (vertical + sloped) (m)	2780
Vertical quay length (m)	2780
Sloped quay length (m)	0
Undeveloped quay length (m)	1900
Max number of vessels handled at the same time	16
Max capacity of anchorage or waiting area for barges (number)	34
Storage capacity (m2)	n.a.
Storage capacity for liquid cargos (m3)	3000 (LPG) + 6000 (biodiesel+biooil)
Storage capacity (TEU)	10000
Storage capacity (CEU - car equivalent unit, for Ro-Ro terminals)	600

Parameters	Explanation / Value
Bunkering facilities within the port area (Yes/No)	yes
Shore-side power supply for vessels (Yes/No)	yes
Road conneection (Yes/No)	yes
Rail connection (Yes/No)	yes
Number of quay cranes of lifting capacity Q < 10 tons	6
Number of quay cranes of lifting capacity 10 < Q < 16 tons	3
Number of quay cranes of lifting capacity 16 < Q < 50 tons	8
Number of quay cranes of lifting capacity Q > 50 tons	0
Total number of quay cranes	17

Table 2: Basic features of Ennshafen Port

5.1.1.2 Ownership, administration (governance) and operation

Ennshafen OÖ GmbH – a company owned by the federal district of Upper Austria - is the owner of the port and do all the administration of the port; Ennshafen port has the PPP-principle as a core part of his strategy, therefore it only builds the basic infrastructure, the suprastructure is invested by private companies, who have got special contracts with EHOÖ (license contracts, shipment contracts...); as well the core parts of the port (quays) are part of a greater mixed area, were a lot of other private companies are owners of ground, buildings and facilities.

In Lower Austria the port company Ennshafen NÖ GmbH is owned by the federal district and has got a quite similar structure like in Upper Austria.

5.1.1.3 Hinterland connections

The whole port area has six road entrances, each with double lines. There are also two main rail entrances accessing the port area from two different sides. Within the port area, there is a system of internal rail network with about 30 km total length.

The Ennshafen Port is the main trimodal transport hub for the west to east and east to west arriving international cargo in the Rhine-Main-Danube waterway region and south to north and north to south arriving international cargo in the North Sea-Adriatic region by the railways. With its 6 road entrances, there is possibility of direct accesses to motorways and main roads that can boost international logistics operations and local businesses.

The Ennshafen Port has the access to the most important seaports through the river Danube. It is connected with the A1 west expressway (Wien-St. Pölten-Linz-Salzburg), A9 (Graz-Wels-Passau), B1 federal highway (Wien-Amstetten-Linz-Salzburg) and B309 (Enns-Steyr) federal highway, what allows outstanding access to the international road network. The railway connections are directly derived from one of the most important Austrian lines – the West Railway (both normal line and high-speed line).

Figure 3: Trimodal infrastructure Ennshafen port

- Direct connection to the highway (A1 west expressway)
- Direct railway connection (west railway)
- Strategically favorable position on the Rhine-Main-Danube-waterway
- TEN-T Core Node
- Trimodal cargo handling
- Access to the neutral infrastructure

5.1.1.4 Port infrastructure

Port Area: total 352 ha; 110 ha are owned by the port authorities (Ennshafen OÖ GmbH und Ennshafen NÖ GmbH) and 242 ha are owned by other private companies; actual in total about 50 ha are not covered with assets or other investments

- 2 basins (basin west-upper Austria, basin east-lower Austria) and several quays along the river side Enns
- Port service time 7/24 – 168h/w
- Cargo handling: over 1 mil t/a
- Container terminal: about 400.000 TEU/a with 4 gantry cranes (trimodal)
- Waterside terminals: 7 for block trains

- Heavy lift and out of gauge handling capacity is possible
- Total length of vertical quays 2780 m
- Max. number of vessels processed at the same time: 16
- Max. number of barges can be processed in waiting areas / undeveloped quays: 34
- Mooring area: 42.000 m^2
- 6 road entrances, with double lines and two main rail entrances access
- 17 km rail tracks (rail network within the port area), many different users and owners
- Storage area with different dedication is available
- Special storage capacity for liquid cargo: 3000 m^2 for LPG, 6000 m^3 for biodiesel and bio-oils, 600 units for cars (equivalent) near the RO-RO ramp
- Bunkering station vessel/barge
- Tank stop for trucks for LNG
- Shore side power supply and waste reception
- Maximum draught: the figure of 2,7 m everywhere in the port has to be fulfilled; there are a lot of spaces with more depth

Quay number	Length	Electricity and water supply	Operator	Details
11-12	370 m	yes	Danubia Speicherei, Fixkraft	Cargo handling and stuffing, Agricultural trade, foodstuff
13	Charging platform	no	Fixkraft	Charging platform
14	230 m	yes	Donausäge Rumplmayr	Saw mill, woodworking
1	200 m	yes	Fuchshuber Agrarhandel	Agricultural trade
4	275 m	yes	Neumüller	Iron and steel trade
16		no	Primagaz	LPG
18-19	630 m	no	Container Terminal Enns	Container
20	192 m	yes	Rauch Recycling	Recovered paper trade, transhipment, stuffing
21	360 m	yes	Available for rent	

Quay number	Length	Electricity and water supply	Operator	Details
6-7	300 m	yes	For puplic use	
-	-	-	Bunkerstation	Bunker service
-	-	-	Lithos	Processing and trade of industrial minerals
-	-	no	RoRo Terminal	vehicles and agricultural machines can drive straight on and off vessels, with no need for additional facilities

Table 3: overview quay numbers of Ennshafen Port

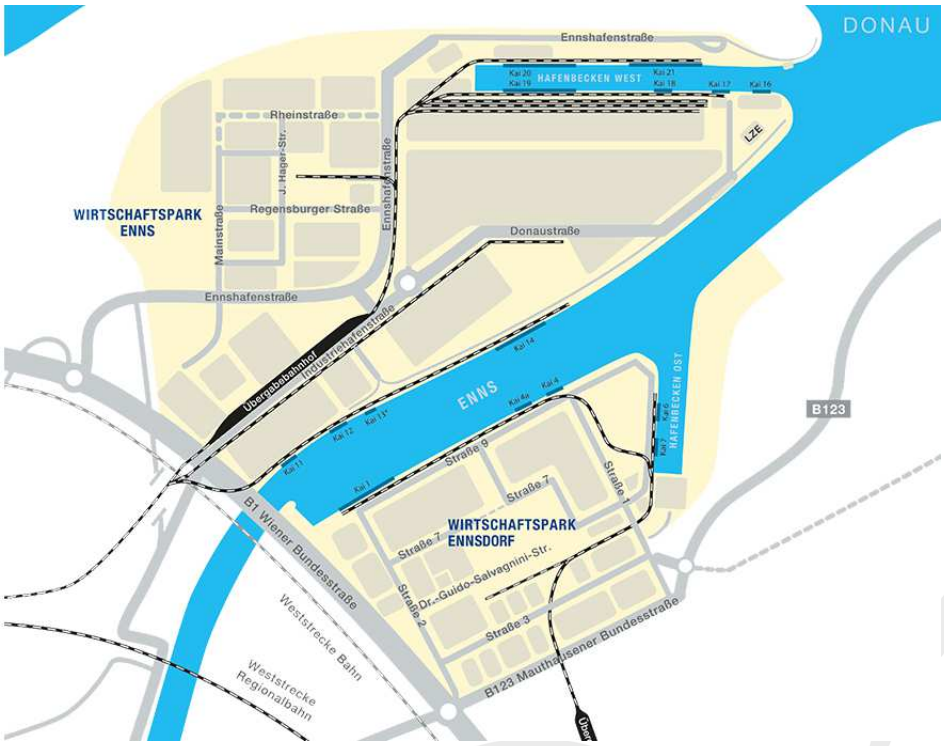

Figure 4: Quay/basin layout in Ennshafen port

5.1.1.5 Port storage facilities

The private business companies in Ennshafen port offer various storage (open/covered) possibilities, but no detailed information can be provided.

10.000 TEU Container terminal

As a multi-modal logistics hub, the Container Terminal Enns (CTE) is a major hinterland terminal for the big sea ports. Spanning some 275,000 square meters and with a capacity of 500,000 twenty-foot equivalent units (TEUs), it has some of the most modern transshipment infrastructure in Austria. Block train rail connections, modern gantry cranes, and a full range of services ensure optimum container handling.

600 CEU RoRo Terminal

The RoRo terminal offers best-in-class service for heavy lift and project cargo; vehicles and agricultural machines can drive straight on and off vessels, with no need for additional facilities. Transshipment to the last mile is an efficient method.
Our RoRo terminal speeds up this transshipment process even further. RoRo logistics makes it possible to avoid time-consuming and expensive road transportation over long distances with circuitous routes. The terminal guarantees frictionless and affordable passage of goods for RoRo transportation, with fast truck access routes ensuring short customs clearance times. The transshipment operations are run on a flexible schedule, starting as soon as the vessel arrives.
In addition, there are 8,500 square meters of storage space available, directly connected to the RoRo ramp. This space is designed for maximum safety, protected from flooding, fenced off, well-lit, and CCTV-monitored.

At Ennshafen port various types of goods can be handled like: fertilizers, animal feed stuff, grains, agricultural products, wood, salt, ores, iron and steel, scrap metal, high and heavy pieces, waste materials, gas (LPG), all kind of cargo in containers (content is confidential).

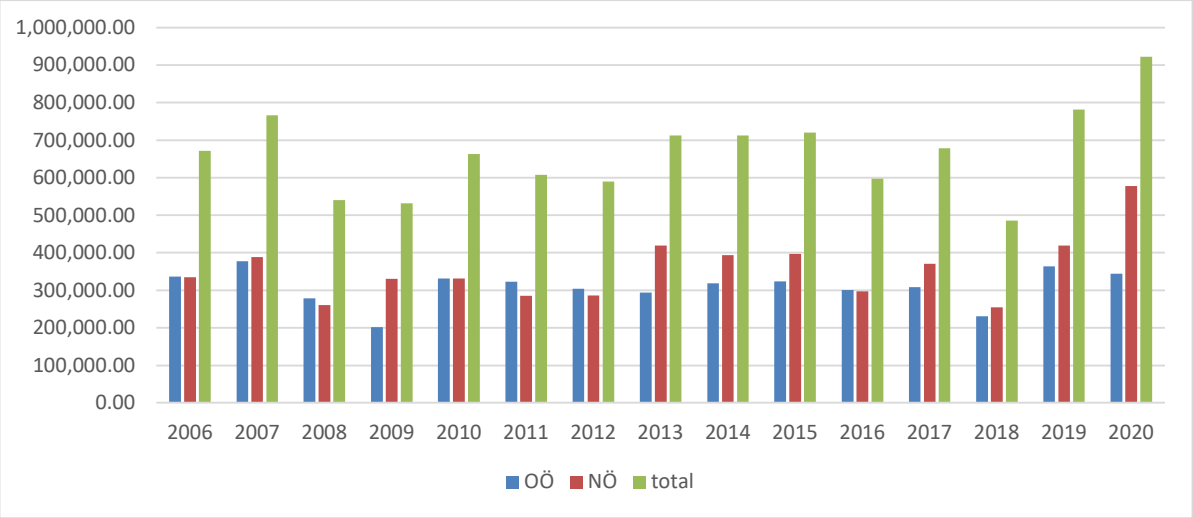

Figure 5: Transshipment Ennshafen port 2006 – 2020

5.1.2 Port of Vienna

Port of Vienna is already the largest port on the Danube in Eastern Austria and its diverse logistical capabilities and capacities continue to be enlarged. Although it is 2.000 km from the Black Sea and 1.500 km from the North Sea, it has the great advantage of being the largest trimodal logistics centre in Austria, bringing together road, rail and water transportation and making it the ideal place for the transportation of goods and for container storage, trade and management.

Port of Vienna is located on river km 1920 of the Danube, covering both left and right bank. Port has three different basins on three nearby locations: Freudenau, Albern and Lobau. In addition, Port of Vienna has a passenger terminal.

Overview of basic port's features are given in the below table.

Parameters	Explanation / Value
Port land owner (State, Region, Municipality, Private, Other)	City of Vienna – Wien Holding – Hafen Wien GmbH
Port authority name	Hafen Wien GmbH
Number of operators (concessionaires, lessors)	3 (Hafen Wien, Wiencont, Tsped)
Total port area (ha)	350 ha
Maximum draught (m) - natural or dredged	2,7 m
Total number of terminals	3
Heavy lift and out-of-gauge handling capacity (Yes/No)	Yes
Ability to handle full block train along the quay (Yes/No)	Yes
Ability to handle full block train in the port area (Yes/No)	Yes
Transhipment equipment for intermodal transport (Yes/No)	Yes
Total quay length (vertical + sloped) (m)	18 km of quays and river banks, but 5 km of quay walls are operational (used for transport operations)
Vertical quay length (m)	Vertical quays are with a total length of 10.500 metre
Sloped quay length (m)	Sloped quays with a total length of 7.600 metres

Parameters	Explanation / Value
Undeveloped quay length (m)	n/a
Max number of vessels handled at the same time	Depends ont he business case, approx. 11
Max capacity of anchorage or waiting area for barges (number)	71
Storage capacity (m2)	n/a
Storage capacity for liquid cargos (m3)	0
Storage capacity (TEU)	7000
Storage capacity (CEU - car equivalent unit, for Ro-Ro terminals)	7000
Bunkering facilities within the port area (Yes/No)	Yes
Shore-side power supply for vessels (Yes/No)	Yes
Road conneection (Yes/No)	Yes
Rail connection (Yes/No)	Yes
Number of quay cranes of lifting capacity Q < 10 tons	n/a
Number of quay cranes of lifting capacity 10 < Q < 16 tons	n/a
Number of quay cranes of lifting capacity 16 < Q < 50 tons	n/a
Number of quay cranes of lifting capacity Q > 50 tons	n/a
Total number of quay cranes	n/a

Table 4: Basic features of the Port of Vienna

5.1.2.1 Ownership, administration (governance) and operation

Hafen Wien GmbH is a member of Wien Holding, the Vienna Economic Chamber (Wirtschaftskammer Wien) has a 5 percent share in the company. Hafen Wien GmbH is the owner of the port facilities comprising real estate, buildings and wharf equipment and operates the harbours in Freudenau, Albern and Lobau.

Hafen Wien is a multifunctional service company offering decades of experience and also the latest technologies.

Thanks to its optimum rail, road and water links and the proximity to Vienna International Airport in Schwechat, it provides an important and practical interface for international trade and transportation.

Hafen Wien operates the largest free port in Austria. There are modern warehouses and well trained and equipped staff for the storage and handling of customs and domestic goods as well as a customs office for rapid clearance. The site is guarded round the clock and feeder roads are exempt from the night driving ban in Vienna. The three harbours on the Danube in Vienna are notable for their modern handling facilities, excellent infrastructure and dependable, well trained workers, ensuring the reliable and rapid handling of all goods, be they building materials, containers, general cargo or bulk goods.

5.1.2.2 Hinterland connections

The Port of Vienna functions as a trimodal hub covering rail, road and river links. This hub is located at the western bank of the Danube River. Connection via road between Port of Vienna and other freight terminals includes B14 Freudenauer Hafenstraße along the port, A4 Ost Autobahn (East Highway connection), S1 Wiener Außenring Schnellstraße; East and South and 3 km of A23 Südosttangente; North and West. Total number of road entrances to port is four (including a passenger terminal), with eight road lanes in total.

The Port of Vienna has freight rail tracks in use and provides transportation connections to Austrian railway network and therefore to other freight centers. Port location is accessed by rail through connection to shunting stations Donaukaibahnhof (3 km, through Donauuferbahn) and Kledering (8km, through Winterhafenbrücke) and the main Austrian railway network, all providing 3 railway accesses to the port with minimum three railway tracks.

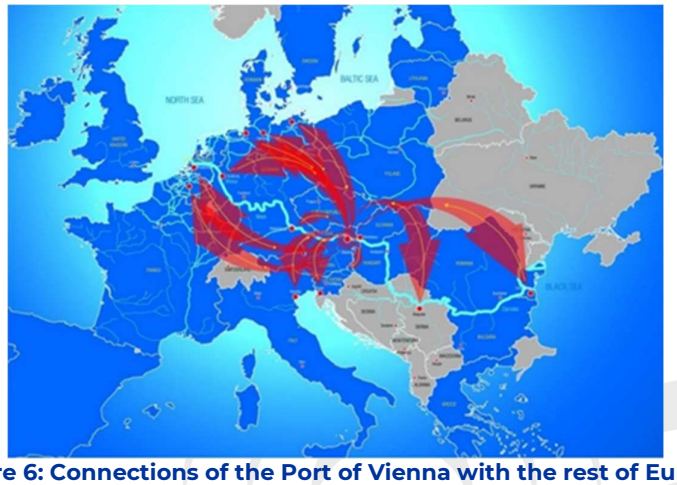

Figure 6: Connections of the Port of Vienna with the rest of Europe

Hinterland of the port of Vienna is mostly related to the so called Vienna Region - including the three federal states Vienna, Lower Austria and Burgenland.

Figure 7: Vienna Region

(Source: www.viennaregion.at)

The central geographical location, its focus on advanced technologies and its top-ranked quality of life are three of the factors which catapult the Vienna Region into its ranking as Central Europe's leading economic region and as one of the EU's foremost economic areas. 45 percent of Austria's gross domestic product is generated in the Vienna Region.

As the capital of Austria, Vienna has the highest gross regional product of all Austrian federal provinces (GRP per capita 47,200 EUR). The economic structure is marked by a strong trend towards the service sector, a high number of business-related services, banking and insurance companies as well as international organisations and enterprises. The industry is currently characterised by the increasingly successful development of new technologies, for example life sciences, energy and environment, mobility, information and communication (ICT) and creative industries. Vienna Region has 3,7 million inhabitants.

Both, the strong manufacturing tradition of Lower Austria, (especially in steel and metal processing and in the chemical industry) and the flexibility of its entrepreneurs have enabled the region to profit markedly from the opening of Eastern Europe.

Compared to the rest of Austria, the service sector has a modestly developed share of the gross regional product of Burgenland. The industry is particularly based on food and beverage production, textiles and wood processing. During recent years the state has undergone change towards technology and tourism with the help of European structural programmes.

In averaged values for the entire Vienna Region, it needs to be noted that the Vienna Region contributes to 44% of the total Austrian Gross Domestic Product, with EUR 38.500 of GDP/capita (Vienna Region).
The share of the industrial sector (figures for 2013) in the economic output in Austria (28,2%) is high in comparison with the EU average (24,6%). Structure of value creation is as follows[1]:

Vienna City

- Primary sector (agriculture, forestry, fishing): 0,1%
- Secondary sector (goods production, mining, energy & water supply, construction): 14,5%
- Tertiary sector (trade and services): 85,5%

Lower Austria

- Primary sector (agriculture, forestry, fishing): 2,9%
- Secondary sector (goods production, mining, energy & water supply, construction): 30,3%
- Tertiary sector (trade and services): 66,8%

Burgenland

- Primary sector (agriculture, forestry, fishing): 3,7%
- Secondary sector (goods production, mining, energy & water supply, construction): 29,1%
- Tertiary sector (trade and services): 67,2%

5.1.2.3 Port infrastructure

The port area covers roughly 350 hectares of port land, in three cargo locations, accompanied by the area belonging to the passenger terminal and a marina for leisure and sport vessels.

Information on any port land available for the development of port-related activities was not available at the time of writing of this report. Nevertheless, based on the development projects that include the land reclamation from the waterfront areas within the port, it can be concluded that the port has no available space for development as it has to reclaim the space from the areas currently occupied by water surface of the port basins.

As mentioned earlier, the port has 3 port basins, providing for the maximum draft of 2,7 meters. Cargo handling capacity was not available at the time of writing this report, except in TEU/year, which reached 450.000 TEU/year.

[1] Quoted as per Vienna Region Business Atlas 2015, available at www.viennaregion.at

Location Freudenau (rkm 1920.1)

Freudenau harbour is the centre of the cargo handling facilities on the Danube in Vienna.

Figure 8: Port of Vienna – location Freudenau

(Source: www.hafen-wien.com)

It contains the handling amenities for bulk goods and raw materials, the container terminal, a car terminal, warehouses and depots, distribution centres for brand articles, the largest free port in Austria with a customs office and its own police station and the offices of Hafen Wien. It is also a haven and winter harbour. Following facilities are located in Freudenau:

- Management and general administrative headquarters
- Free port / customs office
- Warehouse and brand article distribution centre
- Car terminal
- Cargo handling terminal
- Container terminal
- Police station
- Haven and winter harbour

Location Albern (rkm 1918.3)

Albern harbour (Figure 9) handles building materials, agricultural and steel products. There are five large grain silos on the site with a capacity of 90,000 tons, making Albern the most important grain handling location in Eastern Austria. Following facilities exist in the Albern harbour:

- Building materials terminal
- Grain handling and storage
- Heavy goods handling
- Automatic weighbridge

Figure 9: Port of Vienna – location Albern

(Source: www.hafen-wien.com)

Location Lobau (rkm 1916.4)

On this location (Figure 10), the storage and handling of mineral oil production is provided. Every year around 1,000 tankers dock in the seven berths in the oil terminal and around one million tons of mineral oil products are handled there. The oil terminal is connected by pipelines to the central Lobau fuel depot and the oil refinery in Schwechat.

There is also a rail freight station connecting to the railway network. The terminal stations have online measuring systems and automatic loading systems. The pump and loading stations are on floating pontoons.

Figure 10: Port of Vienna – location Lobau

(Source: www.hafen-wien.com)

General cargo and bulk goods such as agricultural products, building materials, metals, salts, vehicles and containers are handled in Freudenau and Albern. Liquid products such as mineral oil derivatives are handled at the Lobau oil terminal.

Heavy transports and motorboats are also handled in Freudenau.

- Highly qualified personnel ensure rapid and reliable processing.
- Bulk goods and raw material warehouses
- Open-air storage areas
- Cargo transshipments are executed by using a fully hydraulic slewable luffing crane with a load capacity of 12 tonnes for grab operations and 13.5 tonnes for hook operations. Additionally, there is a new mobile crane for transshipping cargo of up to 84 tonnes in weight.Handling of loads of up to 450 tonnes in regular operation (with third party)
- Mobile excavators
- Rail connection
- Covered loading zones
- Ro-ro ramp
- 2 weighbridges

The car terminal in the Hafen Wien currently has space for approximately 7.000 vehicles in an open-air area of approximately 200.000 square meters; covered space is available for 2.000 of these vehicles. BuIlt offers direct connection to all motorways and national and international railway networks as well as two high-performance ro-ro ramps for loading and unloading vessels, guaranteeing rapid delivery and transportation of vehicles.

Apart from the storage areas, the car terminal has the following facilities:

- 2 Washing installations
- Vehicle workshops
- Halls for cleaning vehicles and fitting of radios, spoilers and other accessories
- Petrol station, E-Petrol station
- Railway tracks for 50 vehicle transport cars
- Ro-ro facility (2 ramps)

The container terminal operated by WienCont, a subsidiary of Wiener Hafen, has an area of 120.000 square meters. The trimodal terminal connects the traffic modes of road, rail and inland waterways and offers a comprehensive range of services:

- Container handling from 6 to 45 tons with gantry crane and mobile handling equipment; daily block train connections to European seaports;
- Handling 110 trains per week
- Container Transshipment above 400.000 TEU
- Container storage: 7.000 TEU capacity; storage of all types including reefer points for refrigerated containers;
- Container repair and adaptation to individual customer requirements;
- Container business: the company buys and sells new standard and special containers;
- Container rental: the company's containers include not only storage and transport but also office and sanitary containers;
- Customs clearance;
- Incoming/outgoing road transport management.

Port of Vienna has more than 18 kilometres of quays and river banks, but only 5 kilometres of quay walls are operational (used for transport operations). Vertical quays are with a total length of 10.500 metres and sloped quays with a total length of 7.600 metres.

The anchorage capacity is 71 vessels in all three ports.

HAFEN WIEN ein unternehmen der wienholding			
HAFEN FREUDENAU	22	13	**35**
HAFEN ALBERN	10	10	**20**
HAFEN LOBAU	16	0	**16**
GESAMTSUMME HAFEN WIEN	*48*	*23*	***71***

Bunkering facilities are available in the zone of the Port of Vienna.

Facilities for supply of alternative clean fuels (e.g. LNG, etc.) are not yet available in the Port of Vienna

EU FUNDING - Horizon 2020 - Green Deal Call for Proposals .

Waiting for the evaluation of the submitted project RELOAD with the Port of Duisburg as lead partner.

Further develop topics in this area, continue preliminary discussions to actively advance the following points:

- Invest in the Port of Vienna's own vehicles and working machines, biogenic materials, hydrogen, etc.
- Increase the share of e-mobility, own vehicle fleet
- Use of biogenic fuels, hydrogen, etc. for cranes, reach stackers, forklifts, excavators, trucks, customers etc.

Shore-side power supply facilities are not available in the port of Vienna. Waste collection facilities are available, but the info on the facilities for collection of used oils, oily waters, sludge and similar liquid waste was not available at the time of writing of this report.

5.1.2.4 Ports storage facilities

- Basic figures - Infrastructure:
- Covered storage areas: 70,000 m^2
- Raw material depots: 36,000 t
- Open-air storage areas: 200,000 m^2
- Car terminal: Outdoor car park for 7,000 vehicles
- Indoor car park for 2,000 vehicles
- Container terminal: 10,000 TEU
- Block train rails: 4 per 700 m

Storage Facilities for Bulk Cargo:

Storage boxes, bulk cargo warehouses with 44,000 m^3 capacity, raw material warehouses with 3,000 m^3 capacity, outdoor storage space

- GMP+ certified
- Partly Conveyor belt systems, excavators/dredgers and wheel loaders may be used according to individual requirements

Storage Facilitys for Containers:

10,000 TEU (twenty-foot equivalent units)

Storage Facilities for general Cargo:

There are 70,000 square meters of covered storage facilities in the Hafen Wien ideally located between the A23 Südosttangente city motorway and the A4 Ostautobahn motorway.

- High-rack storage
- Block storage
- Cold stores and deep freeze storage

Customs clearance

Our experienced on-site staff will be happy to assist you in customs clearance. The premises of the Port of Freudenau accommodate two customs warehouses:

- The customs warehouse E on the north and south banks (area of container terminal – WienCont) is operated by our subsidiary "TerminalSped".
- The public customs warehouse A is operated by the Port of Vienna ("Hafen Wien").

Overall

Security is a top priority at the logistics centre of the Port of Vienna. The premises are fully fenced with 24/7 surveillance. The Vienna Customs Office as well as a police station are also located on site.

5.2 Railways of relevance for IWT

This section does not refer to the railways which are physically connecting the port gate with the rest of the railway network as they are assessed in deliverable D.T2.2.1, but to the major and important railway sections of different corridors passing close enough to the ports analysed in previous section to have an impact to those ports.

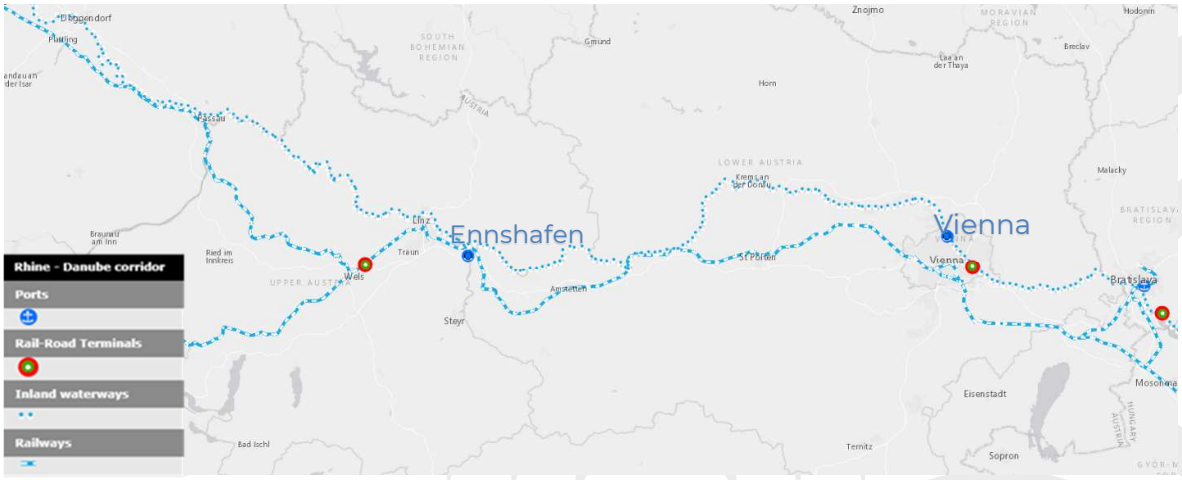

Figure 11: Location of the ports of Enns and Vienna

TEN-T Connection with Port of Vienna, as the next Core Node downstream port, is achieved directly over inland waterways corridors, railways corridors and road corridors. One railway corridor connects Ennshafen Port and Port of Vienna with 13 sections (table below).

Vienna						
	Railway					
	Option	*Section*	*Type*	*Corridor*	*Network*	*Status*
Enns	1	Linz Ebelsberg – Amstetten	High speed	Rhine - Danube	Core Network	Completed
		Amstetten – Sarling	High speed	Rhine - Danube	Core Network	To be upgraded
		Sarling - Gross Sierning	High speed	Rhine - Danube	Core Network	Completed
		Gross Sierning - St. Poelten	High speed	Rhine - Danube	Core Network	Completed
		St. Poelten - St. Poelten (east)	High speed	Rhine - Danube	Core Network	Completed
		St. Poelten (east) - Bahnhof Tullnerfeld	High speed	Rhine - Danube	Core Network	Completed
		Bahnhof Tullnerfeld - Wien Handersdorf	High speed	Rhine - Danube	Core Network	Completed
		Bahnhof Tullnerfeld - Wien Handersdorf (part 2)	High speed	Rhine - Danube	Core Network	Completed
		Wien Handersdorf (part 2) - Wien Meidling	High speed	Rhine - Danube	Core Network	Completed
		Wien Meidling - Wien Inzersdorf	Conventional	Baltic-Adriatic Rhine - Danube	Core Network	Completed
		Wien Inzersdorf – Kledering	Conventional	Rhine - Danube	Core Network	Completed
		Kledering - Wien Freudenau Hafen (part 2)	Conventional	Baltic-Adriatic	Core Network	Completed
		Kledering - Wien Freudenau Hafen (part 1)	Conventional	Baltic-Adriatic	Core Network	Completed

Figure 12: Railway sections between Enns and Vienna

All sections belong to the core TEN-T network and have been completed, except one from Amstetten to Sarling which is to be upgraded. Railway corridor network belongs to the following two 2 TEN-T corridors: Baltic-Adriatic and Rhine-Danube.

WESTERN LINE

The fast and comfortable way to get from Vienna to Salzburg: The Western Line is one of the most important traffic arteries in Austria. The upgrade is delivering improvements for passengers and freight traffic.

Figure 13: Western line[2]

5.2.1 Railway section - Linz-Wien Meidling

Section	Parameter	Value	Unit	Reference in Regulation 1315/2013
Linz Ebelsberg - Amstetten	Length	56,68	km	n/a
	Electrification	100	% of km	§12 except for isolated networks
	Track gauge 1435mm	100	% of km	§13 as priority for RR infrastructure development
	Line speed >= 100km/h	100	% of km	§39 requirement for core network
	Axle load (>=22.5t)	100	% of km	
	Train length (740m)	100	% of km	

Table 5: Linz-Ebelsberg-Amstetten railway section parameters

[2] Source: ÖBB

Section	Parameter	Value	Unit	Reference in Regulation 1315/2013
Amstetten - Wien Meidling	Length	124	km	n/a
	Electrification	100	% of km	§12 except for isolated networks
	Track gauge 1435mm	100	% of km	§13 as priority for RR infrastructure development
	Line speed >= 100km/h	100	% of km	§39 requirement for core network
	Axle load (>=22.5t)	100	% of km	
	Train length (740m)	100	% of km	

Table 6: Amstetten – Wien Meidling railway section parameters

5.3 Roads of relevance for IWT

This section does not refer to the roads which are physically connecting the port gate with the rest of the road network as they are assessed in deliverable D.T2.2.1, but to the major and important road sections of different corridors passing close enough to the ports analyzed in previous section to have an impact to those ports.

Figure 14: Birdsview of roads relevant for IWT in Austria

Since the A1 is the most important west-east connection in the Austrian road network, Asfinag has continuously expanded sections to six lanes. The goal was a six-lane expansion between the Steinhäusl node and the Voralpenkreuz node. With the completion of the renovation and widening of the section from Matzleinsdorf (km 85.9) to Pöchlarn (km 91.0), this project was completed at the end of April 2018. The Westautobahn (A1) connects the federal capital Vienna with Salzburg, where it meets the A8 from Germany at Walserberg. It is one of the most important motorways in Austria and provides the west-east connection.

5.3.1 Road section Motorway A1 Linz – Steinhäusl

Ennshafen Port is connected to the most important west east Motorway A1 in Austrians road network.

Category / Section	Parameter	Value	Unit
Motorway A1 /Linz - Steinhäusl	Length	138,014	km
	Number of lanes (total, in both directions)	6	lanes
	Maximum speed allowed	130	km/h
	Axle load for trucks allowed	40.	t/axle

Table 7: Motorway A1 Linz-Steinhäusl road section parameters

5.3.2 Road section Motorway A4 Ostautobahn

Beside the described A4 Ostautobahn, there are also A3 Südostautobahn and A2 Südautoabahn that are in the greater area of Vienna but in larger distance to the Port of Vienna and are not core parts of the Corridor.

Category / Section	Parameter	Value	Unit
A4 Ostautobahn	Length	66	km
	Number of lanes (total, in both directions)	4	lanes
	Maximum speed allowed	130	km/h
	Axle load for trucks allowed	n.a.	t/axle

Table 8: Motorway A4 Ostautobahn road section parameters

5.4 Multimodal terminals outside of ports

Multimodal terminals within ports are analyzed in deliverable D.T2.1.1: "Multimodal facilities and services". Therefore, this section in this report will tackle multimodal terminals close to, but outside of ports, which can have an impact on the throughput of a nearby port or even its development plans.

5.4.1 Multimodal terminal - Linz Stadthafen CCT

Trimodal: Rail – Road – Ship

Location Saxingerstraße 1a, 4020 Linz GPS: 48.310767, 14.325397

Opening hours Monday to Friday 5.00–19.00

Terminal operator Linz Service GmbH - Opened in 1979

Terminal infrastructure characteristics	Value	Unit/ Description	Notes
Total area		(m^2)	125000
Handling capacity		TEU/year	
Storage area		(m^2)	120000
Depot (base) storage capacity		TEU	5000
Capacity to handle block-trains		(Yes/No)	no
Maximum length of complete block-train		(m)	
Number of rail sidings for loading/unloading		(n)	4
Total length of rail sidings for loading/unloading		(m)	37000
Electrified train accessibility		(Yes/No)	
Number of road lanes for truck traffic		(n)	
Number of road lanes for truck loading/unloading		(n)	2
Parking space for trucks / semitrailers		(n)	3000m^2

Table 9: Linz Stadthafen CCT terminal parameters

Services: Weighbridge, Container cleaning, Container maintenance, Container repair facility, Container stuffing and stripping, Cooling units service, Customs office, Dangerous goods handling, Dangerous goods preparation facilities, Heavy lift Packaging Services, Veterinary inspection, Unaccompanied combined transport –

Maintenance facilities, Unaccompanied combined transport – Transshipment, SOLAS container weight verification

Catchment area Cities, industrial areas – 70 km, NUTS 3 Regionen312, 313, 314, 121

5.4.2 Multimodal terminal - Wels Vbf CCT

Bimodal: Rail - Road

Location: Terminalstraße 100, 4600 Wels, GPS: 48.188764, 14.073469,

Operator: ÖBB-Infrastruktur AG, FN 71396 w, UID ATU 16210507 - Opened in 1985

Services: ISU, Quality control, Unaccompanied combined transport – Maintenance facilities, Unaccompanied combined transport – Transshipment, SOLAS container weight verification, Rolling road transports

Terminal infrastructure characteristics	Value	Unit/ Description	Notes
Total area		(m^2)	120000
Handling capacity		TEU/year	n.a.
Storage area		(m^2)	35000
Depot (base) storage capacity		TEU	1700
Capacity to handle block-trains		(Yes/No)	no
Maximum length of complete block-train		(m)	580
Number of rail sidings for loading/unloading		(n)	10
Total length of rail sidings for loading/unloading		(m)	5600
Electrified train accessibility		(Yes/No)	n.a.
Number of road lanes for truck traffic		(n)	4
Number of road lanes for truck loading/unloading		(n)	6
Parking space for trucks / semitrailers		(n)	45

Table 10: Wels Vbf CCT terminal parameters

Catchment area Located in the center of Upper Austria; the terminal is situated directly at the highway connection to A 25.

Opening hours Monday to Friday 6.15–19.30, Saturday 6.15–17.30 Rolling Road: Sunday 17.45 to Saturday 22.15

Transshipment: Gantry cranes 2 x 45 t, Reach stackers 4 x 45 t, Further transshipment devices, Rolling road

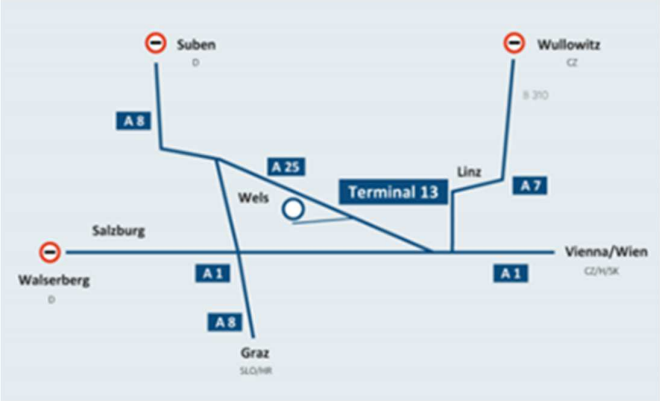

Figure 15: Wels Vbf CCT location in the road network

5.4.3 Multimodal terminal - Port of Krems

Trimodal: Rail – Road – Ship

Location: Karl-Mierka-Straße 7-9, 3500 Krems, GPS: 48.405719, 15.642278

Operator: Rhenus Donauhafen Krems GmbH & CoKG

Services: Weighbridge, Container cleaning, Container maintenance, Container repair facility, Container stuffing and stripping, Customs office, Dangerous goods handling, Dangerous goods preparation facilities, Quality control, Tank container cleaning, Unaccompanied combined transport – Maintenance facilities, Unaccompanied combined transport - Transshipment

Terminal infrastructure characteristics	Value	Unit/ Description	Notes
Total area		(m^2)	350,000 m^2
Handling capacity		TEU/day	440 TEU/d
Storage area		(m^2)	Outdoor 60,000 m^2, Covered 30,000
Depot (base) storage capacity		TEU	10,000 TEU
Capacity to handle block-trains		(Yes/No)	n.a.
Maximum length of complete block-train		(m)	680 m

Terminal infrastructure characteristics	Value	Unit/ Description	Notes
Number of rail sidings for loading/unloading		(n)	4
Total length of rail sidings for loading/unloading		(m)	8,000 m
Electrified train accessibility		(Yes/No)	n.a.
Number of road lanes for truck traffic		(n)	n.a.
Number of road lanes for truck loading/unloading		(n)	n.a.
Parking space for trucks / semitrailers		(n)	yes

Table 11: Port of Krems terminal parameters

Catchment Area: Vienna, St. Pölten; from border crossing at Klein Haugsdorf (CZ) – for runs in the context of combined traffic exemption from the banon night-time driving

B 303, A 22 motorway (A 22 Donauuferautobahn), S 5 motorway (S 5 Stockerauer–Schnellstraße), Doktor-Franz-Wilhelm-Straße, Karl-Mierka-Straße,

From border crossing at Neu-Naglberg (CZ) – For runs in the context of combined traffic exemption from the banon night-time driving

B 2, Schrems, Vitis, B 36, Zwettl, B 37 Krems, S 5 motorway (S 5 Stockerauer–Schnellstraße), Doktor-Franz-Wilhelm-Straße, Karl-Mierka-Straße

Opening Hours: Contrainer terminal: Monday to Friday 6.00–18.00

Port: Monday to Friday 7.00–16.00

Transshipment: max. total transshipment volume 440 TEU/d, Container 40 TEU/h, Bridge cranes 2 x 40 t and 50 t, Reach stackers 4

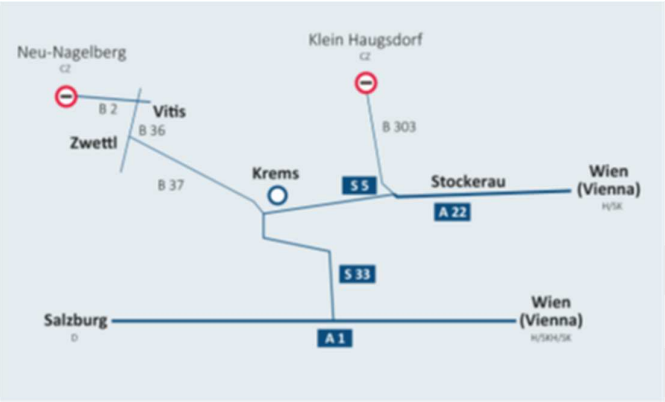

Figure 16: Location of the Krems Container Terminal in the road network

5.4.4 Multimodal terminal - Port of Vienna-Freudenau

Trimodal: Rail – Road – Ship

Location Port: Seitenhafenstraße 15, 1020 Vienna;

Location Wiencont: Freudenauer Hafenstraße 8-10, GPS: 48.181337, 16.467182

Operator: Wiencont Container Terminal GesmbH

Services: Container transshipment, storage and trucking, Containerchecking, stuffing, stripping, Solas container weight verification, Container cleaning, Container maintenance, Container repair facility, Container rent and trade, Container stuffing and stripping, Cooling units service, Veterinary inspection, Quality control, Dangerous goods preparation facilities, Unaccompanied combined transport – Maintenance facilities, Unaccompanied combined transport – Transshipment, ISU, Customs office (by our subsidiary company Terminalsped Speditionsgesellschaft mbH) Heavy lift 45 t, Packaging Services by Hafen Wien, Ro-Ro devices by Hafen Wien.

Terminal infrastructure characteristics	Value	Unit/ Description	Notes
Total area		(m^2)	
Handling capacity		TEU/d	2 000 TEU/d
Storage area		(m^2)	Outdoor 200,000 m^2 Covered 70,000 m^2
Depot (base) storage capacity		TEU	10,000 TEU
Capacity to handle block-trains		(Yes/No)	n.a.
Maximum length of complete block-train		(m)	650 m/700 m
Number of rail sidings for loading/unloading		(n)	Terminal1: 4 x 650 m Terminal2: 3x (2x560m, 1x250m) Terminal3: 1 x 650 m
Total length of rail sidings for loading/unloading		(m)	50,000 m
Electrified train accessibility		(Yes/No)	n.a.
Number of road lanes for truck traffic		(n)	3
Number of road lanes for truck loading/unloading		(n)	3
Parking space for trucks / semitrailers		(n)	30

Table 12: Port of Vienna-Freudenau terminal parameters

Catchment Area: Western Hungary, Western Slovakia

From border crossing at Nickelsdorf (SK/H) – For runs in the context of combined traffic exemption from the ban on night-time driving.

A 4 motorway (A 4 Ostautobahn), Exit *Simmeringer Haide* (EXIT 4),
B 228 (*Jedletzbergerstraße*), *Margetinstraße → Artillerieplatz →* B 14 (*Zinnergasse*), *Freudenauer Hafenstraße → Seitenhafenstraße → Hafen Freudenau.*

From border crossing at Klingenbach (H) – For runs in the context of combined traffic exemption from the ban on night-time driving.

B 16 (Ödenburger Straße), A 3 motorway (A 3 Südostautobahn), A 2 motorway (A 2 Südautobahn), A 4 motorway (A 4 Ostautobahn), Exit *Simmeringer Haide* (EXIT 4), B 228 (*Jedletzbergerstraße*), *Margetinstraße → Artillerieplatz →* B 14 (*Zinnergasse*), *Freudenauer Hafenstraße → Seitenhafenstraße → Hafen Freudenau.*

From border crossing at Drasenhofen (CZ) – For runs in the context of combined traffic exemption from the ban on night-time driving.

B 7/E 461, B 3, B 227, A 22 motorway (A 22 Donauuferautobahn), A 23 motorway (A 23 Wiener Südosttangente), A 4 motorway (A 4 Ostautobahn), Exit Simmeringer Haide (EXIT 4), B 228 (Jedletzbergerstraße), Margetinstraße → Artillerieplatz → B 14 (Zinnergasse), Freudenauer Hafenstraße → Seitenhafenstraße → Hafen Freudenau

Figure 17: Location of Wiencont Container terminal

Opening Hours: Port of Vienna: Monday to Thursday 6.00–20.00, Friday 6.00–19.00 (Saturday/Sunday upon special agreement) Wiencont: Monday to Thursday 6.00–19.30, Friday 6.00–18.00

Transshipment: max. total transshipment volume 2 000 TEU/d, General cargo by Hafen Wien, Conveyor belt by Hafen Wien, bridge cranes 84t, forklifts < 3t 5 by Hafen wien, forklifts > 5t 6 by Hafen Wien, gantry cranes (with spreaders) 3 x 45 t by Wiencont, lumber stackers by Hafen Wien, mobile cranes by Hafen Wien, paper

clamps 2 by Hafen Wien, Reach stackers (with spreaders) 15 x 45 t by Wiencont, Ro-Ro ramp for cars by Hafen Wien, Ro-Ro ramp for trucks by Hafen Wien, Semi-trailer transportation vehicle 1 by Wiencont, Wheel loader by Hafen Wien, Further transshipment devices (with spreaders) 8 stackers for empty containers by Wiencont

6 Transport infrastructure status quo in Slovakia

6.1 Ports

6.1.1 Port of Bratislava

Port of Bratislava is the most important strategic port in Slovakia on the international Danube waterway. Port includes port basins and both banks of the Danube between river kilometres 1.867,29 to 1.862,00 Currently it fulfils the functions of a universal cargo and passenger port. The port's potential is enhanced by its excellent geographical location at the crossroads of the Rhine – Danube and Baltic Sea – Adriatic Sea corridors of TEN-T transport networks and easy access to other European capitals and important ports in Vienna and Budapest. Bratislava Port is a complex of water bodies, hydro technical installations, port basins and related infrastructure, facilities and storage areas served and connected to both rail and road transportation networks and infrastructure. Port is located right next to the city centre of Bratislava and has direct access to abovementioned Core Network Corridors by rail and road. Ports serves as protection port, providing shelter for vessels in case of extremely high/low water level, ice or any other emergency condition on the Danube river.

Figure 18: Port of Bratislava

Overview of basic port's features are given in the below table.

Parameters	Explanation / Value
Port land owner (State, Region, Municipality, Private, Other)	state-owned joint stock company
Port authority name	Verejné prístavy, a.s. / Public ports, JSC
Number of operators (concessionaires, lessors)	1 dominant private port operator
Total port area (ha)	156,68
Maximum draught (m) - natural or dredged	5
Total number of terminals	10
Heavy lift and out-of-gauge handling capacity (Yes/No)	Yes
Ability to handle full block train along the quay (Yes/No)	Yes
Ability to handle full block train in the port area (Yes/No)	Yes
Transhipment equipment for intermodal transport (Yes/No)	Yes
Total quay length (vertical + sloped) (m)	8 445
Vertical quay length (m)	3 138
Sloped quay length (m)	5 317
Undeveloped quay length (m)	750
Max number of vessels handled at the same time	n/a
Max capacity of anchorage or waiting area for barges (number)	84
Storage capacity (m2)	101 125 m2 (75 335 m2 covered + 25 790 m2 open)
Storage capacity for liquid cargos (m3)	Intermediate storage of liquid goods is not performed
Storage capacity (TEU)	n/a
Storage capacity (CEU - car equivalent unit, for Ro-Ro terminals)	400 cars per shift
Bunkering facilities within the port area (Yes/No)	Yes

Parameters	Explanation / Value
Shore-side power supply for vessels (Yes/No)	Yes
Road connection (Yes/No)	Yes
Rail connection (Yes/No)	Yes
Number of quay cranes of lifting capacity Q < 10 tons	12
Number of quay cranes of lifting capacity 10 < Q < 16 tons	7
Number of quay cranes of lifting capacity 16 < Q < 50 tons	9
Number of quay cranes of lifting capacity Q > 50 tons	2
Total number of quay cranes	30

Table 13: Basic features of the Port of Bratislava

6.1.1.1 Ownership, administration (governance) and operation

All lands of the Port of Bratislava are owned by the company Public Ports Slovakia, whose founder is Slovak Republic represented by the Ministry of Transport and Construction of the Slovak Republic. The infrastructure and superstructure situated in the Port of Bratislava is owned by the private company. Public Ports Slovakia is the port authority of the Port of Bratislava, while the main operator in the Port of Bratislava is a private company Slovenská plavba a prístavy, a.s / Slovak shipping and ports (EN).

6.1.1.2 Hinterland connections

The port is located at the intersection of other international European highways – road and rail connection. The significance of Bratislava's location is further enhanced by the fact that three multimodal corridors run through the town:

- Corridor IV: Berlin/Nuremberg - Prague – Budapest - Constanta/Thessaloniki – Istanbul, leading from the motorway D2, state border with the Czech Republic – Kúty – Bratislava (Rusovce) – to the state border with Hungary. The I / 2 road is the parallel route to the corridor.
- Corridor Va: Bratislava - Žilina - Košice – Užhorod, state border with Austria – motorway D4 –junction D2 Jarovce –motorway D2 - junction D1 –motorway D1 – Trnava – with continuing in the direction to Žilina –state border with Ukraine, the I/61 road is the parallel route to the corridor.
- Corridor VII: The Danube river.

The European Transport Corridors type TEM (Trans-European North-South Motorway) and the International "E"Road Network are also passing through the Bratislava region:

- E 58 (D1, D2, D4) Trnava - Bratislava – a border with Austria – (Wienna),
- E 65 (D2) (Břeclav) – a border with the Czech Republic- Bratislava - Rusovce – a border with Hungary– (Rajka),
- E 75 (D1, D2) a border with Poland - Žilina - Trenčín - Bratislava - Rusovce – a border with Hungary – (Rajka),
- E 571 (II/572, I/61, I/62) Bratislava - Senec - Nitra -Zvolen - Lučenec –Košice,
- E 575 (I/63) Bratislava - Dunajská Streda - Medveďov – a border with Hungary.

6.1.1.3 Port infrastructure

Port quays. Total quay length in port is 8 445 m, out of which 3 138 m represent vertical and resting 5 317 m represent sloped quays. Quay length suitable for future development is up to 750 m. Quays are not locate on the river flow but inside port basins. Quays are divided into several positions that. Their location and purpose is defined in the Port Regulation of the public ports in Slovak Republic (Instruction of the Operator of Public Ports in the Slovak Republic issued in accordance with Article 5 par. 5 and 8 of the Act No. 338/2000 Coll. on Inland Navigation and on Amendments to Certain Acts, as amended.)

Protective quay. To eliminate the consequences of the floods, flood protection was implemented in the capital. From the point of view of the assessed locality, its technical solution is designed for the level of 1000 annual water. However, protective wall bypasses the harbor from the outside. This mean that wall protects the city, not the port.

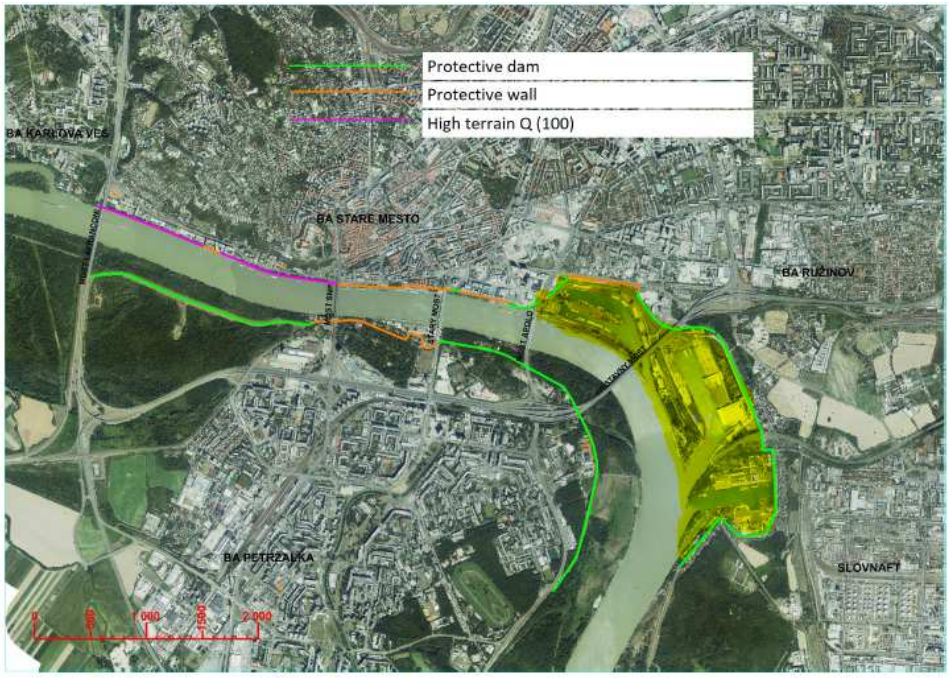

Figure 19: Flood Control Line Bratislava

Utility infrastructure (electricity, water, sewerage) as a part of the port infrastructure is owned by SPaP, a. s. The electricity circuit within the port is equipped by 2 loops (high-voltage circuits) that have a common central point in T-5 transformer station. Technical state of the HV and LV electrical wiring, equipment and objects corresponds to time of their use. According to the information provided by SPaP, a. s. all devices are functional and operational, properly treated, maintained and used in accordance with manufacturers' recommendations, standards and relevant legislation.

Crane technology was built in 1973, the latest in 1989. Landing cranes for heavy and oversized goods handling were built in 1988, and the container terminal cranes were installed in 2004-2009. Currently used cranes are : type GANZ, KSB, KONE, BRUN and two mobile cranes AD160 and AD28. Only one crane (GANZ type (HU) 16/32 tons) has undergone general reconstruction since production in 2013. It follows that most of the transshipment technologies at the port are at the end of their life cycle. In general, only minimal resources have been invested in port facilities in recent decades to maintain their operability. As the entire superstructure is owned by a private operator, this agenda should be provided by the operator. However, there are currently no appropriate institutional conditions in the port of Bratislava that would allow the VPAS to perform the role of regulator with control over port development. This is the main reason for the current inadequate state of port technology. More modern transhipment technologies are now available on the market. They allow much more efficient transhipment of goods and the associated lower operating costs. In order to increase the competitiveness and attractiveness of inland water transport under the conditions of the Bratislava Public Port, it is recommended to address the area of

institutional relations and thus enable the modernization of transhipment technologies.

Transhipment of mineral oils (diesel and petrol) is possible in the export regime. This means filling of inland shipping tankers on two transfer platforms intended for the transfer of diesel and one platform intended for the transfer of petrol. The operation is ensured by the most modern technology of transfer arms with a tear-off closing device when the vessel is torn from the platform, anti-overfilling technology, shutdown in various situations, as well as automatic bubble screen and retractable submerged wall protecting the Danube and Little Danube from oil spills. Transhipment capacity is up to 500m3/hour for diesel and up to 200m3/hour for petrol. Port operators do not offer storage of mineral oils.

Future development depends on property rights and relations in public ports in Slovakia. Land is owned by VPAS, however, all infrastructure and superstructure are owned by private operator. This includes all buildings, storage facilities, roads, railways, transhipment technology, electricity, and water infrastructure. All eventual investments into cranes and other machinery will be baes on future settings of ownership relations.

VPAS elaborated Master plan II – long-term concept of the development of the Port of Bratislava. Currently VPAS are planning elaboration of Feasibility study that will propose and assess technical and technological variants for future development of the port.

6.1.1.4 Port's storage facilities

Total size of storage available in the port of Bratislava is 75 355 m2 out of which 25 790 m2 are covered storage area and resting 25 790 m2 are open storage areas. Since port is divided into multiple parts built in different decades following different purposes, storage facilities are not spread proportionally. Trimodal terminal that stands as significant part of the Pálenisko basin that offers storage capacity of 1400 TEU / 4600 m2. Port has storage capacity for bulk / break-bulk cargo, containers, steel coils and piece goods, including heavy and oversized ones. Port offers anchorages / berthing positions for vessels carrying dangerous goods as well.

6.1.2 Port of Komarno

6.1.2.1 Position

Komarno Port is the second most important port in Slovakia. The port is 100 km downriver from Bratislava Port, located on the left-bank of the Danube between river kilometres 1,770.00 and 1,762.00. The port is also considered the terminus of the Váh inland waterway planned to connect Žilina with the Danube. Komarno Port is a public port used for the transshipment of goods between rail, road and water transport directly or using temporary storage in port facilities. Conceptually, technologically and structurally, Komarno Port is built for the transshipment of bulk materials. The port can also be used to protect vessels in this section of the Danube and a portion of the Váh in emergencies (flooding, ice floes, high water conditions, etc.). In terms of passenger traffic, the port is primarily used in the summer months by pleasure craft in the open channel of the Danube. Port of Komárno is part of Thine-Danube TEN-T Core Network Corridor.

Figure 20: Port of Komárno

Overview of basic port's features are given in the below table.

Parameters	Explanation / Value
Port land owner (State, Region, Municipality, Private, Other)	state-owned joint stock company
Port authority name	Verejné prístavy, a.s. / Public ports, JSC
Number of operators (concessionaires, lessors)	1 dominant private port operator

Parameters	Explanation / Value
Total port area (ha)	20
Maximum draught (m) - natural or dredged	7
Total number of terminals	2
Heavy lift and out-of-gauge handling capacity (Yes/No)	No
Ability to handle full block train along the quay (Yes/No)	Yes
Ability to handle full block train in the port area (Yes/No)	Yes
Transhipment equipment for intermodal transport (Yes/No)	Yes
Total quay length (vertical + sloped) (m)	5445
Vertical quay length (m)	1112
Sloped quay length (m)	4333
Undeveloped quay length (m)	n/a
Max number of vessels handled at the same time	n/a
Max capacity of anchorage or waiting area for barges (number)	50
Storage capacity (m2)	32 730 (6 600 m2 covered + 26 130 m2 open)
Storage capacity for liquid cargos (m3)	0
Storage capacity (TEU)	6500
Storage capacity (CEU - car equivalent unit, for Ro-Ro terminals)	Ro-Ro not available
Bunkering facilities within the port area (Yes/No)	No
Shore-side power supply for vessels (Yes/No)	Yes
Road connection (Yes/No)	Yes
Rail connection (Yes/No)	Yes
Number of quay cranes of lifting capacity Q < 10 tons	0

Parameters	Explanation / Value
Number of quay cranes of lifting capacity 10 < Q < 16 tons	0
Number of quay cranes of lifting capacity 16 < Q < 50 tons	8
Number of quay cranes of lifting capacity Q > 50 tons	0
Total number of quay cranes	8

Table 14: Basic features of the Port of Komárno

6.1.2.2 Ownership, administration (governance) and operation

Ownership relations in port of Komárno are same as in Bratislava. All the land is owned by the company Public Ports Slovakia, whose founder is Slovak Republic represented by the Ministry of Transport and Construction of the Slovak Republic. The infrastructure and superstructure situated in the Port of Bratislava is owned by the private company. Main operator in the Port of Bratislava is a private company Slovenská plavba a prístavy, a.s / Slovak shipping and ports.

6.1.2.3 Hinterland connections

The port is located at the intersection of two major roads no. I/63 and no. I/64. and near to cross-border bridge over the Danube river between Slovakia and Hungary. It has three road entrances. Rail connection of port is connected to the port siding in the cargo port of Komarno and also to Hungary. In Komárno port there is a railway siding with a total length of 14.4 km. In the eastern part, the railway siding consists of the transshipment tracks No.2 and No.4 and a total of 13 ladder tracks. In the western part are used for the transhipment tracks No. 1, 3 and 5 with the combined weight. The harbour station, which includes the railway siding of the port, is the Komárno railway station. The IWW (Danube) is part of the TEN-T Core Network and the Rhine-Danube Core Network Corridor. The port is located close to confluence with the river Vah (an inland waterway of international importance).

6.1.2.4 Ports infrastructure

The port of Komárno in terms of activity is divided into six sections. The activity is focused on the handling of liquid goods, metal materials and bulk goods. There is a protection zone established under the bridges that cross the Danube in the port. This zone is 20 meters downstream and upstream for safety reasons (vessels are not allowed to anchor there).

In the "Port Regulations of Public Ports of the Slovak Republic“, the handling and parking positions, conditions and method of mooring, mooring and permissibility of standing the vessel in the port of Komárno are determined.

The cargo port has mooring elements, stairs to transhipment positions on a sloping bank and service walkways. However, they are mostly in poor technical and operational condition. Some are owned by the watercourse administrator SVP, some owned by SPaP. The current technical condition of the infrastructure and superstructure in the territory of the port of Komárno is to a large extent unsatisfactory - this infrastructure and superstructure is considerably obsolete and maintained only to the extent necessary. In particular, there is a need to revitalize public port facilities (stairs, coastal walkways, mooring elements, perpendicular transhipment edges, etc.) used by ship's crew and others in public port activities to European standards.

Ownership situation in port of Komárno is the same as in Bratislava. Land is owned by VPAS and infrastructure and superstructure by private SPaP. This includes all buildings, storage facilities, roads, railways, transhipment technology, electricity, and water infrastructure. All eventual investments into cranes and other machinery will be baes on future settings of ownership relations.

VPAS elaborated Master plan - long-term concept of the development of the Port of Komárno. Currently VPAS are working on Feasibility study that will propose and assess technical and technological variants for future development of the port.

Petroleum products, derivatives and liquid biomass products can be pumped between all modes of transport. The terminal has its own railway siding with its own service, which is located directly in the Custom warehouse. Upon agreement, there are trimodal pumping services (tanker / train / tanker, ADN / RID / ADR) and transhipment of oil derivatives. The terminal offers the possibility of pumping all types of oil derivatives and liquid products transported on the Danube. The pumping capacity is 120,000 mt / month; about 1,500,000 mt / year.

6.1.2.5 Port’s storage facilities

The port has covered warehouses with an area of approximately 6,600 m2 and open landfills of approximately 26,130 m2 alongside port´s quays. In the port there is also Customs warehouse with an area of 1 700 m2. Current status and condition of warehouses is not sustainable and strategical document elaborated recently strongly recommend to build modern warehouses, silos and storage tanks.

6.2 Railways of relevance for IWT

This section does not refer to the railways which are physically connecting the port gate with the rest of the railway network as they are assessed in deliverable D.T2.2.1, but to the major and important railway sections of different corridors passing close enough to the ports analyzed in previous section to have an impact to those ports.

For this country report following railways sections have been analysed:

1. Bratislava – Devínska Nová ves - Kúty

This section is a part of two TEN-T Core Network Corridors, Baltic-Adriatic and Orient/East – Med. It connects capitol city of Bratislava to the state border with Czech Republic and provides transportation direction Prague and Germany.

2. Bratislava – Leopoldov

This section is part of Baltic-Adriatic TEN-T Core Network Corridor, and is a part of connection between north branch (Czech Republic – Ukraine) and south branch (Germany – Romania) of Rhine-Danube Core Network Corridor.

3. Bratislava – Petržalka

This section is part of two TEN-T Core Network Corridors, Orient/East – Med (direction Budapest) and Rhine-Danube (direction Wien or Budapest)

4. Bratislava – Dunajská Streda – Komárno

This section connects locations of two most important Slovak public ports. In the middle, in Dunajská Streda there is a private container terminal.

5. Komarom – Tatabanya (direction Budapest)
6. Komarom - Gyor (direction Wien).

6.2.1 Railway section Bratislava – Kúty

This section is a part of two TEN-T Core Network Corridors, Baltic-Adriatic and Orient/East – Med. It connects capitol city of Bratislava to the state border with Czech Republic and provides transportation direction Prague and Germany. Section is divided into two sub-sections, Bratislava – Devínska Nová Ves and Devínska Nová ves-Kúty. Maximum allowed speed is 140 km/h, minimum clean driving time without stops is estimated at 31,2 min. Average daily use of cargo trains is 53 trains. Section consists of two tracks electrified with alternating current. Share in overall freight transport performance is 7,2% (train kilometers) and 6% (gross ton – kilometers).

Section	Parameter	Value	Unit	Reference in Regulation 1315/2013
Bratislava – Devínska Nová Ves - Kúty	Length	64,5	km	n/a
	Electrification	100	% of km	§12 except for isolated networks
	Track gauge 1435mm	100	% of km	§13 as priority for RR infrastructure development

Section	Parameter	Value	Unit	Reference in Regulation 1315/2013
	Line speed >= 100km/h	71	% of km	§39 requirement for core network
	Axle load (>=22.5t)		% of km	
	Train length (740m)	100	% of km	

Table 15: Bratislava – Devínska Nová Ves - Kúty railway section parameters

Figure 21: Railway section Bratislava – Devínska Nová Ves - Kúty

6.2.2 Railway section Bratislava – Leopoldov

This section is part of Baltic-Adriatic TEN-T Core Network Corridor, and is a part of connection between north branch (Czech Republic – Ukraine) and south branch (Germany – Romania) of Rhine-Danube Core Network Corridor. Maximum allowed speed is 160 km/h, the lowest reduced speed in the section is 30 km/h and mminimum clean driving time without stops is estimated at 26,2 min. Average daily use of cargo trains is 20 trains. Section consists of two tracks electrified with alternating current. Share in overall freight transport performance is 3,3% (train kilometers) and 2,8% (gross ton – kilometers).

Section	Parameter	Value	Unit	Reference in Regulation 1315/2013
Bratislava - Leopoldov	Length	63,5	km	n/a
	Electrification	100	% of km	§12 except for isolated

Section	Parameter	Value	Unit	Reference in Regulation 1315/2013
				networks
	Track gauge 1435mm	100	% of km	§13 as priority for RR infrastructure development
	Line speed >= 100km/h	100	% of km	§39 requirement for core network
	Axle load (>=22.5t)		% of km	
	Train length (740m)	100	% of km	

Table 16: Bratislava – Leopoldovrailway section parameters

Figure 22: Railway section Bratislava – Leopoldov

6.2.3 Railway section Bratislava – Petržalka

This section is part of two TEN-T Core Network Corridors, Orient/East – Med (direction Budapest) and Rhine-Danube (direction Wien or Budapest). Average daily use of cargo trains is 47 trains. Section consists of two tracks electrified with alternating current. Share in overall freight transport performance is 2,1% (train kilometers) and 1,4% (gross tonne – kilometers).

Section	Parameter	Value	Unit	Reference in Regulation 1315/2013
Bratislava - Petržalka	Length	16,9	km	n/a
	Electrification	100	% of km	§12 except for isolated networks
	Track gauge 1435mm	100	% of km	§13 as priority for RR infrastructure development
	Line speed >= 100km/h	0	% of km	§39 requirement for core network
	Axle load (>=22.5t)		% of km	
	Train length (740m)	100	% of km	

Table 17: Bratislava – Petržalka railway section parameters

Figure 23: Railway section Bratislava – Petržalka

6.2.4 Railway section Bratislava – Dunajská Streda - Komárno

This section connects locations of two most important Slovak public ports. In the middle, in Dunajská Streda there is a private container terminal. Section is divided into two sub-sections, Bratislava – Dunajská Streda and Dunajská Streda - Komárno Maximum allowed speed is 80 km/h, the lowest reduced speed in the section is 40 km/h and minimum clean driving time without stops is estimated at 74,3 min. Average daily use of cargo trains is 9 trains. Section consists of one track that is not elecrified. Share in overall freight transport performance is 1% (train kilometers) and 0,9% (gross ton – kilometers).

Section	Parameter	Value	Unit	Reference in Regulation 1315/2013
Bratislava - Komárno	Length	91,8	km	n/a
	Electrification	0	% of km	§12 except for isolated networks
	Track gauge 1435mm	100	% of km	§13 as priority for RR infrastructure development
	Line speed >= 100km/h	0	% of km	Not part of CNC
	Axle load (>=22.5t)		% of km	
	Train length (740m)	100	% of km	

Table 18: Bratislava –Dunajská Streda - Komárno railway section parameters

Figure 24: Railway section Bratislava – Dunajská Streda – Komárno

6.3 Roads of relevance for IWT

This section does not refer to the roads which are physically connecting the port gate with the rest of the road network as they are assessed in deliverable D.T2.2.1, but to the major and important road sections of different corridors passing close enough to the ports analysed in previous section to have an impact to those ports.

For this country report following railways sections have been analysed:

1. Brodské – Čunovo (D2)

This section is part of Orient/East – Med TEN-T Core Network Corridor connecting Bratislava with Czech Republic and Germany in direction north and Hungary, Romania, Bulgaria and Greece direction south.

2. Bratislava – Žilina (D1)

This section is part of Baltic-Adriatic TEN-T Core Network Corridor (from Poland to Italy and Slovenia) and connects north and south branches of Rhine-Danube Core Network Corridor. It is also part of the most important motorway in Slovakia.

3. Gyor (HU) - Tatabanya (HU)

6.3.1 Road section Brodské – Čunovo

The D2 motorway is the second longest and at the same time the only fully completed Slovak motorway. The route of the D2 motorway is 80.5 kilometers long and starts at the border crossing Lanžhot (CZ) / Brodské (SK) on the cross-border motorway bridge over the Morava River, where there is also a zero kilometer of the motorway. The bridge itself divides the state border approximately in its middle, one part of the bridge is part of the Slovak D2 motorway, the Czech side of the bridge is again part of the Czech D2 motorway, which continues from the border to Brno. The route of the motorway continues from the state border in a southern direction through Kúty, Malacky and Bratislava, where it crosses the D4 motorway twice and at the same time crosses the D1 motorway, to the border crossing Čunovo (SK) / Rajka (HU), where it feeds seamlessly onto the Hungarian M15 motorway. The D2 motorway is thus connected to the Czech, Hungarian and, through the D4 motorway, also to the Austrian motorway network. The D2 motorway is part of the main route of the 4th Pan-European Corridor, which starts in Dresden and continues through Prague, Brno, Bratislava and Budapest to Arad, Romania. The motorway route is also part of the European roads E58, E65 and E75.

With regard to the predominant technical and construction simplicity of the construction of this motorway, especially in the section from the state border with the Czech Republic to the Bratislava - Lamač exit, the motorway is built in this section for a design speed of up to 150 km / h. We can find more construction-intensive sections of the D2 motorway in Bratislava, where the motorway is led by a complicated stretch in the city's inner city. At the same time, there are also construction-intensive buildings, such as the Sitina tunnel, with a length of 1,440 meters or bridging the Danube with the 761-meter-long Lafranconi bridge. In the medium term, it is planned to extend the D2 motorway to 3 + 3 lanes in the section from the D2xD4, Stupava junction to the Bratislava - Lamač exit.

Category / Section	Parameter	Value	Unit
Motorway D2 / Brodské - Čunovo	Length	81,5	km
	Number of lanes (total, in both directions)	6	lanes
	Maximum speed allowed	130	km/h
	Axle load for trucks allowed		t/axle

Table 19: Brodské – Čunovo road section parameters

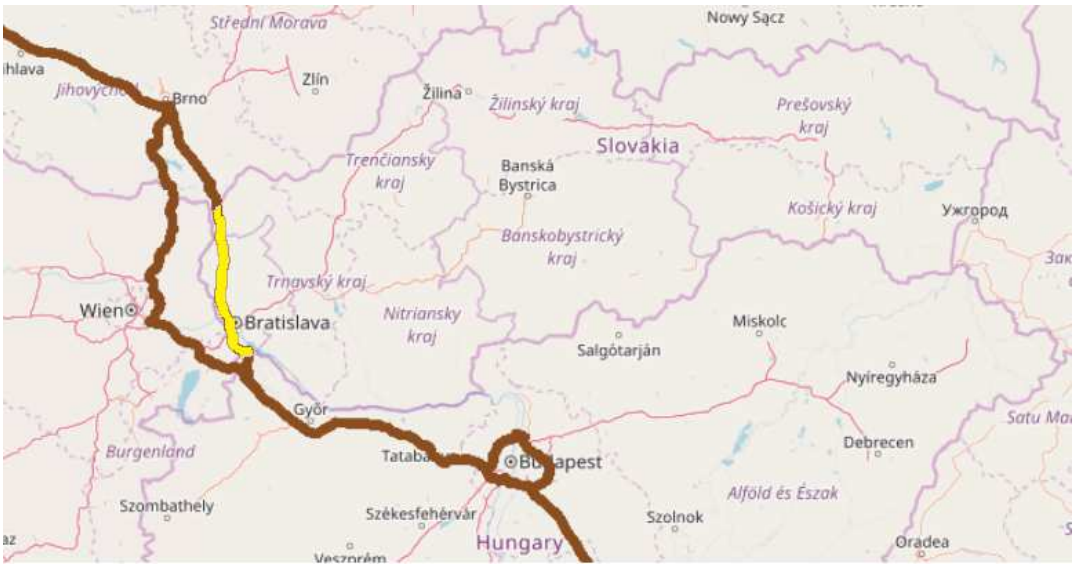

Figure 25: Orient/East-MED CNC D2 Brodské - Čunovo[3]

6.3.2 Road section Bratislava – Žilina

The D1 motorway is the most important and at the same time the longest Slovak motorway, which after its completion will connect Bratislava with state border with Ukraine. Motorway is not yet complete; some sections are still not finished this report focuses on section Bratislava – Žilina. The D1 motorway is part of branch "A", the 5th pan-European corridor with the route Bratislava - Žilina - Košice - Uzhgorod - Lviv and the European roads E50, E58, E75, E442 and E571. This section is part of Baltic-Adriatic TEN-T Core Network Corridor and as well as parallel rail section, connects north branch (Czech Republic – Ukraine) and south branch (Germany – Romania) of Rhine-Danube Core Network Corridor.

Category / Section	Parameter	Value	Unit
Motorway D1 / Bratislava - Žilina	Length	200	km
	Number of lanes (total, in both directions)	4	lanes
	Maximum speed allowed	130	km/h
	Axle load for trucks allowed		t/axle

Table 20: Bratislava – Žilina road section parameters

[3] https://ec.europa.eu/transport/infrastructure/tentec/tentec-portal/map/maps.html

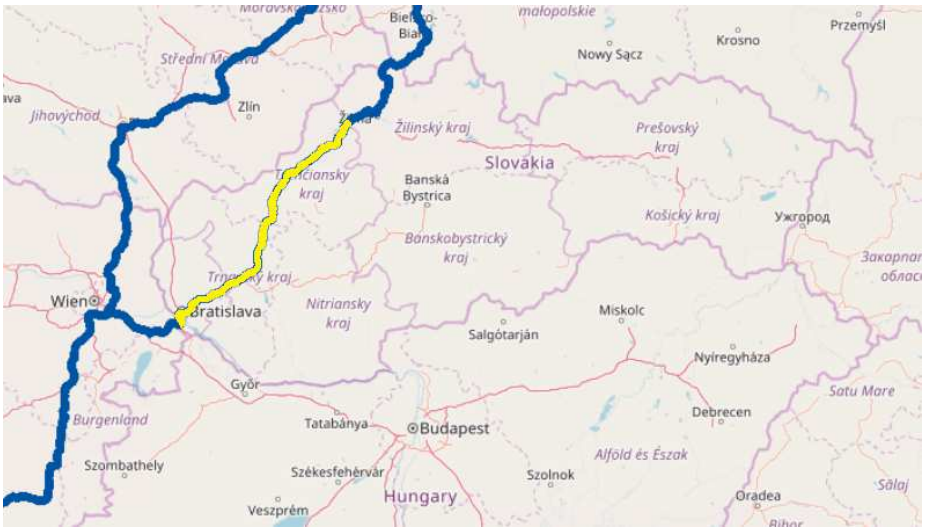

Figure 26: Baltic-Adriatic CNC D1 Bratislava – Žilina[4]

6.4 Multimodal terminals outside of ports

Multimodal terminals within ports are analyzed in deliverable D.T2.1.1: "Multimodal facilities and services". Therefore, this section in this report will tackle multimodal terminals close to, but outside of ports, which can have an impact on the throughput of a nearby port or even its development plans.

6.4.1 Multimodal terminal Metrans Dunajská Streda

Terminal is located in South-West part of Slovakia, almost in the middle between Bratislava and Komárno. It is part of METRANS network and provides bimodal transhipment (rail/road). This terminal provides connection to Xi'an (PRC). Additional services are: customs office, reefer plugs – PTI incl. small repairs, depot for empty containers – capacity 15.000 TEUs, covered repair shop incl. container cleaning, instalment of liner bags or "hangertainers".

Terminal is operational MON – FRI 00:00 – 24:00, SAT 00:00 – 18:00, SUN 06:00 – 24:00

Departure	Destination	Times/week	Direction
METRANS Dunajska Streda	METRANS Ceska Trebova (CZ)	14	bothways
METRANS Dunajska Streda	METRANS Budapest (HU)	6	from
METRANS Dunajska Streda	METRANS Kosice (SK)	6	bothways
METRANS Dunajska Streda	METRANS Krems (AT)	1	bothways
METRANS Dunajska Streda	TIP Zilina (SK)	4	bothways
METRANS Dunajska Streda	Dobra / Xi'an (PRC)	1	bothways

Table 21: METRANS Dunajská Streda feeder services

[4] https://ec.europa.eu/transport/infrastructure/tentec/tentec-portal/map/maps.html

Terminal infrastructure characteristics	Value	Unit/ Description	Notes
Total area		280 000 (m^2)	
Handling capacity		n/aTEU/year	
Storage area		250 000 (m^2)	
Depot (base) storage capacity		n/a TEU	
Capacity to handle block-trains		n/a(Yes/No)	
Maximum length of complete block-train		n/aa(m)	
Number of rail sidings for loading/unloading		9(n)	
Rail tracks 650 m		5(n)	
Rail tracks 550 m		4(n)	
Total length of rail sidings for loading/unloading		n/a (m)	
Electrified train accessibility		n/a(Yes/No)	
Number of road lanes for truck traffic		n/a (n)	
Number of road lanes for truck loading/unloading		n/a (n)	
Parking space for trucks / semitrailers		n/a (n)	
RMG cranes		3 (n)	
Reach stackers 45t		6 (n)	
Reach stackers 12t		9 (n)	

Table 22: METRANS Dunajská Streda terminal parameters

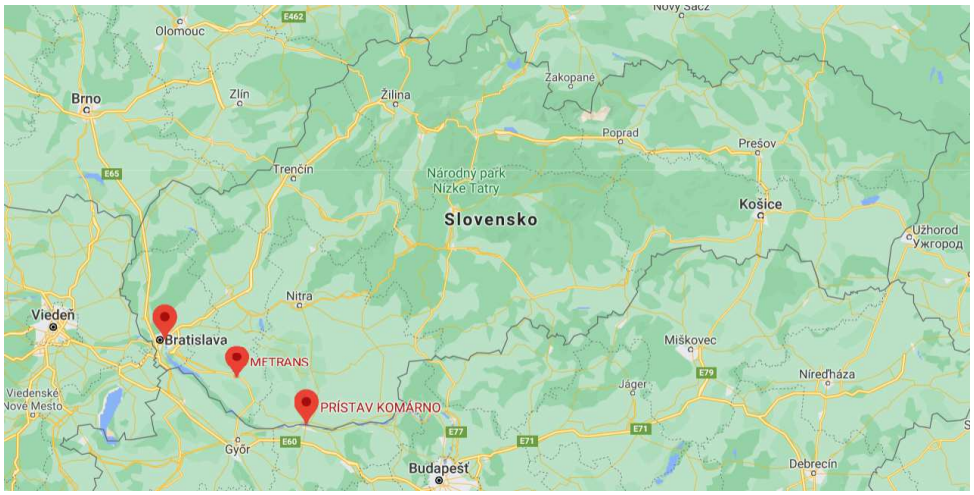

Figure 27: Metrans Danubia a.s.

7 Transport infrastructure status quo in Hungary

7.1 Ports

7.1.1 Port of Budapest

7.1.1.1 Position

Freeport of Budapest is located in Csepel Island, the south part of the capital of Hungary. Csepel is the 21st district of Budapest. The address of MAHART Freeport Plc, the port land and infrastructure owner organization, is 1211 Budapest, Weiss Manfréd (formerly: Szabadkikötő) Road 5. The port is located in the Danube-Mainland Rhine waterway on the Danube section crossing the continent northwest to south-east in the inland waterways of Europe, at the 1.640 km of riverbank.

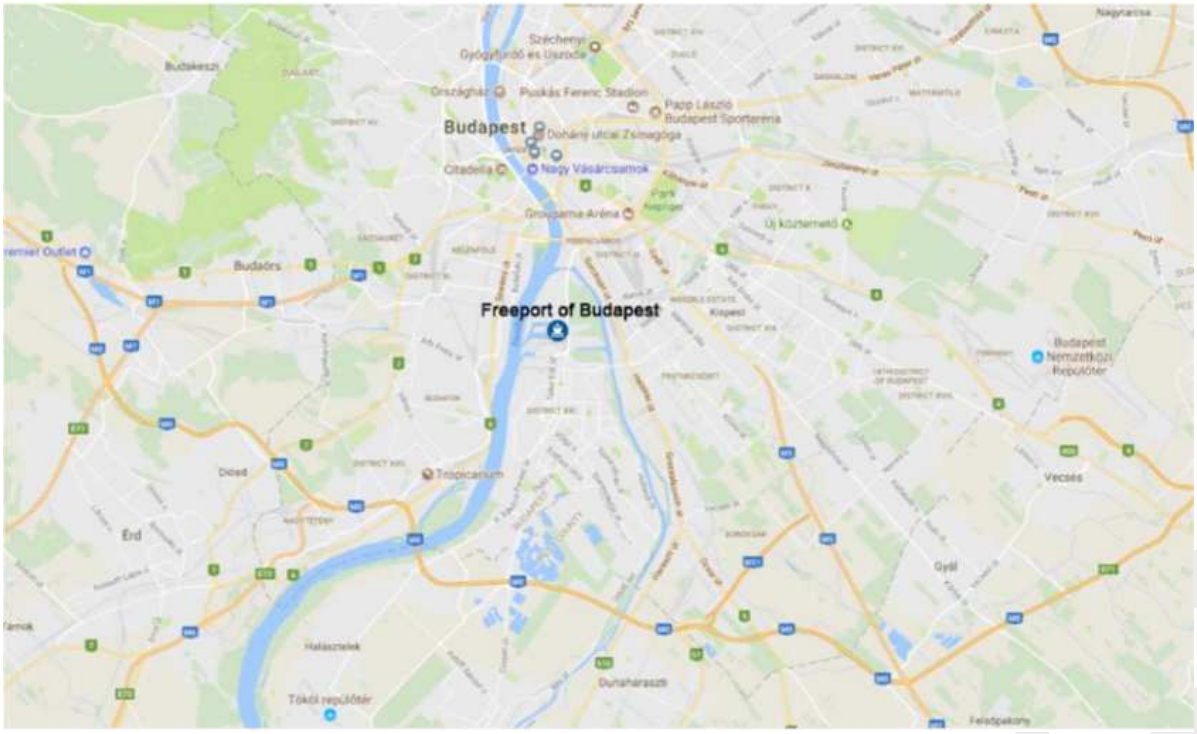

Figure 28: Location of the Freeport of Budapest

(Source: HFIP, via Google Maps, 2021)

Overview of basic port's features are given in the below table.

Parameters	Explanation / Value
Port land owner (State, Region, Municipality, Private, Other)	State
Port authority name	Budapesti Szabadkikötő Logisztikai Zrt
Number of operators (concessionaires)	1(lessors) 5
Total port area (ha)	153
Maximum draught (m) - natural or dredged	2,5
Total number of terminals	8
Heavy lift and out-of-gauge handling capacity (Yes/No)	no
Ability to handle full block train along the quay (Yes/No)	yes
Ability to handle full block train in the port area (Yes/No)	yes
Transhipment equipment for intermodal transport (Yes/No)	yes
Total quay length (vertical + sloped) (m)	4850
Vertical quay length (m)	1650
Sloped quay length (m)	3200
Undeveloped quay length (m)	1200
Max number of vessels handled at the same time	18
Max capacity of anchorage or waiting area for barges (number)	24
Storage capacity (m2)	104000+40000
Storage capacity for liquid cargos (m3)	no
Storage capacity (TEU)	6800
Storage capacity (CEU - car equivalent unit, for Ro-Ro terminals)	5000
Bunkering facilities within the port area (Yes/No)	yes

Parameters	Explanation / Value
Shore-side power supply for vessels (Yes/No)	yes
Road conneection (Yes/No)	yes
Rail connection (Yes/No)	yes
Number of quay cranes of lifting capacity Q < 10 tons	3
Number of quay cranes of lifting capacity 10 < Q < 16 tons	3
Number of quay cranes of lifting capacity 16 < Q < 50 tons	2
Number of quay cranes of lifting capacity Q > 50 tons	0
Total number of quay cranes	8

Table 23: Basic features of Freeport of Budapest

7.1.1.2 Ownership, administration (governance) and operation

MAHART Freeport Plc., the owner of the port land and its infrastructure (quays, basins, berths, etc.) is a 100% state owned company owned by the Hungarian National Asset Management Inc. The port authority, responsible for port governance and port administration, is Freeport of Budapest Logistics Ltd. (hereinafter: BSZL). BSZL's legal successor called MAHART Freeport Corp. was set up on 1 September 2005. MAHART Freeport provides the right to BSZL to operate the Freeport of Budapest for 75 years within the pre-privatization and operation contract. This contract includes the possession and use of property owned by MAHART Freeport.

The Freeport is operated by public and private companies running their businesses in the area of the port, among them the most important ones are:

- ArcelorMittal Distribution Hungary Ltd.
- Lagermax Dunalogisztikai Ltd.
- MAHART Container Centre Ltd. (M.C.C.)
- Ghibili Ltd.
- MASPED PORT Logistics Centre
- Ferroport Ltd.
- MAHART Gabonatárház Kft. (Grain warehouse Ltd.)

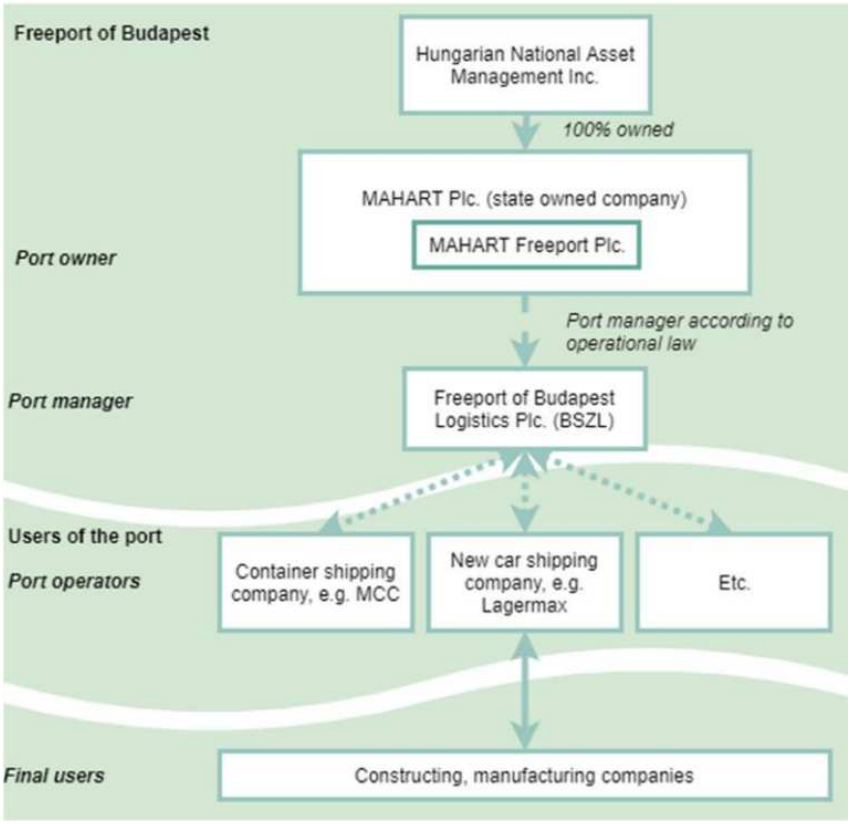

Figure 29: The organizational structure of Freeport of Budapest

(Source: HFIP)

7.1.1.3 Hinterland connections

As the Freeport of Budapest is located in Csepel, on the edge of the metropolitan area, and is Hungary's second largest port and logistic centre, its hinterland is actually the whole country. There are important international corridors (TEN-T corridors) going through Hungary both east-west and north-south directions.

Csepel Island is surrounded by the River Danube. Freeport is located on its north part, accessible on water on the right branch. From the direction of Austria and Slovakia, it is the third freight port among the bigger ones in Hungary, after Győr-Gönyű and Komárom. On the way to the south, the biggest ports are in Dunaújváros and Baja on the River Danube. Close to the border of Serbia, Port of Mohács will be constructed and developed in the upcoming years to provide high-end services and become an excellent logistic centre as the first/last checkpoint in the country for vessels coming from/going to the direction of Constance.

The Freeport and Csepel Island are linked into the national railway networks by the Gubacsi bridge located on the north-eastern part of the island. On railway, Hungary has 9 border crossing points towards Slovakia, 6 to Austria, 1 to Slovenia, 3 to Croatia, 2 to Serbia, 5 to Romania and 2 to Ukraine. Besides there are 16 organizer stations in the country.

As regards road connections, Freeport is accessible on highways M1 from Austria, M7 from Croatia, Slovenia, M6 from the south, M5 from Serbia, Romania and M3 from the east, using the ring-road, M0 as well. Trucks can approach the port from the highways via either M0 – M51 – Ócsai Road/Grassalkovics Road/Helsinki Road (on the Pest side by the river) – Gubacsi bridge, or M0 – II. Rákóczi Ferenc Road (through Csepel downtown) – Weiss Manfréd Road, or from the city through Kvassay Jenő Bridge.

7.1.1.4 Port infrastructure

The free port has 3 basins, of which 2 are suitable for loading commercial goods and the 3rd for loading petrol products. Commercial Basin No. 1 has 10 berths suitable for loading bulk goods, grain, steel products and containers. 1pc of 12.5 ton, 1pc of 15 ton, 1pc of 16 ton, 1pc of 8 ton and 1pc of 25 ton crane are available for loading bulk and iron goods. A slide for loading grain from rail cars and roads is available, as well as a 10-ton bridge crane for loading and unloading bulk goods directly in the warehouse area, where bulk goods can be stored. It is done through the unloading system of the grain warehouse. The grain storage capacity of wheat, taking into account 32,000 tons. The water-side loading of the container terminal, which covers an area of about 100,000 m2, is made possible by a 32-ton container crane. At each loading bay in commercial basin No. 1, railway tracks provide the possibility of transhipment from rail to vessel. The RO-RO port can be found in the commercial basin No. 2 , which allows cars, trucks, other agricultural machinery to land directly.

There are 3 berths in the Petrol basin for loading petrol products. One of them is used to store from vessel into shore-based tanks, while the other is used for transshipment from shore-based tanks to a ship, which is used to refuel hotel ships arriving in Budapest, among other things.

Commercial basin No. 1 has 2 shore-side electricity supply for vessel and 1 water drawing space.

34 hectares of development area are available in the port for further development.

7.1.1.5 Port's storage facilities

Directly along the Commercial basin No. 1 is the grain storage building, which is 33,000m2. It is suitable for storing grain in silos and on floor. An additional 5500m2 coastal warehouse is suitable for storing bulk goods unloaded or loaded from ship, railway and road. A 20,000m2 hall is used for the storage and loading of various iron goods. The additional storage capacity of the port mentioned above is used for handling and loading various commercial goods.

7.1.2 Port of Dunaújváros

7.1.2.1 Position

The port is located on the right bank of the Danube, in the bay between 1580-1579 rkm, on the Szalki island.

The closest port from north is Port of Adony, between 1597 rkm and 1598 rkm on the right bank, and from south is Port of Dunavecse, on the left bank of the Danube at the 1572 rkm.

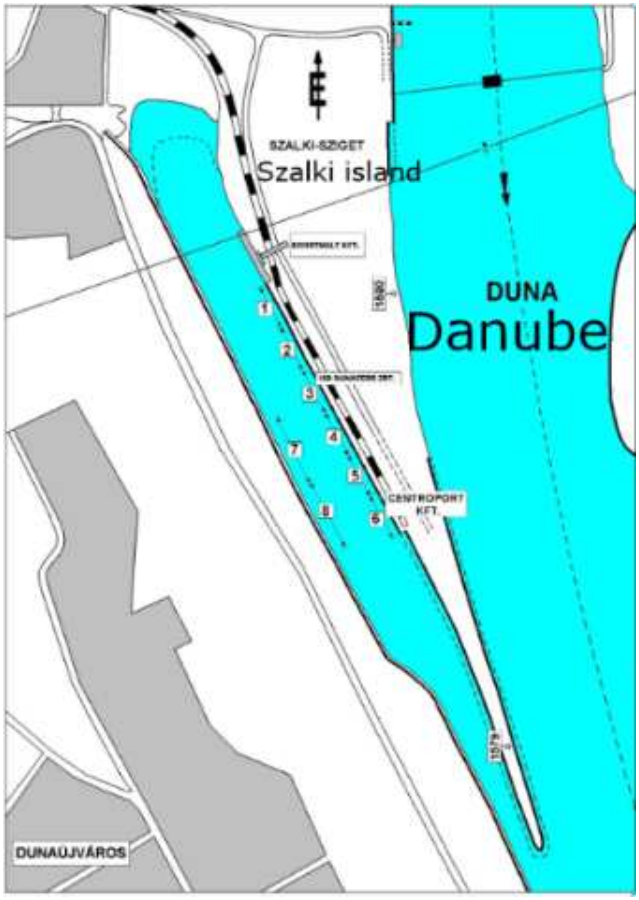

Figure 30: Dunaújváros port basin layout

Overview of basic port's features are given in the below table.

Parameters	Explanation / Value
Port land owner (State, Region, Municipality, Private, Other)	Private
Port authority name	ISD Dunaferr Dunai Vasmű Zrt.
Number of operators (concessionaires, lessors)	2

Parameters	Explanation / Value
Total port area (ha)	5,2
Maximum draught (m) - natural or dredged	dredged 3 mtrs
Total number of terminals	6
Heavy lift and out-of-gauge handling capacity (Yes/No)	Yes
Ability to handle full block train along the quay (Yes/No)	Yes
Ability to handle full block train in the port area (Yes/No)	Yes
Transhipment equipment for intermodal transport (Yes/No)	Yes
Total quay length (vertical + sloped) (m)	563
Vertical quay length (m)	563
Sloped quay length (m)	0
Undeveloped quay length (m)	0
Max number of vessels handled at the same time	6
Max capacity of anchorage or waiting area for barges (number)	5x4
Storage capacity (m2)	1600
Storage capacity for liquid cargos (m3)	-
Storage capacity (TEU)	-
Storage capacity (CEU - car equivalent unit, for Ro-Ro terminals)	-
Bunkering facilities within the port area (Yes/No)	No
Shore-side power supply for vessels (Yes/No)	Yes
Road conneection (Yes/No)	Yes
Rail connection (Yes/No)	Yes
Number of quay cranes of lifting capacity Q < 10 tons	3

Parameters	Explanation / Value
Number of quay cranes of lifting capacity 10 < Q < 16 tons	2
Number of quay cranes of lifting capacity 16 < Q < 50 tons	2
Number of quay cranes of lifting capacity Q > 50 tons	0
Total number of quay cranes	7

Table 24: Basic features of the Port of Dunaújváros

7.1.2.2 Ownership, administration (governance) and operation

Owner of the port territory is ISD Dunaferr Zrt. 4,8 HA, and Centroport Kft.0,3446 HA. Cooperation on the basis of a contract, taking into account the interests of both parties.

7.1.2.3 Hinterland connections

Dunaújváros has excellent transport facilities, as it is easily accessible by road, rail and water. On the road, it is affected by the M6 motorway and the constantly expanding M8 motorway, and it is also connected to important cities such as Székesfehérvár, via main road number 6. It can be reached by train on line number 42 connecting Pusztaszabolcs and Dunaújváros. By waterway, the Port of Dunaújváros can be approached on the Rhine-Danube Corridor, which is part of the TEN-T network.

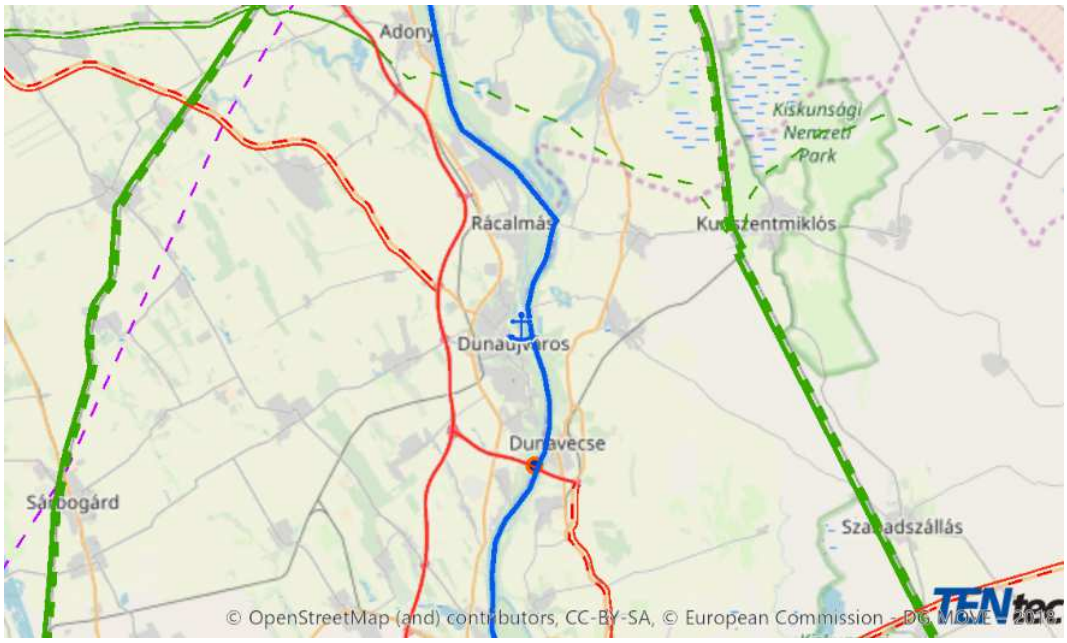

Figure 31: Dunaújváros port position in the nearby TEN-T network

7.1.2.4 Port infrastructure

The port has 6 berths, where 7 gantry cranes operate, of which 3 have a maximum load capacity of 6 tons, 2 have 12 tons and 2 have a maximum load capacity of 27.5 tons.

The port only has vertical quay walls. Each 30 meters mooring bollard/bits are built in whole along berth side – for mooring vessels/barges. There are staircases intended to each quay, which are lightened in night time.

Electric power for the port supplied from 2 x 630 KWA transformers.

Drinking water is supplied on an NA 100 tube.

All alongside there is a double rail track. Rail tracks are connected at North to a 200 meters long section from where it connected with a single-track industrial rail to Pusztaszabolcs – Paks main rail line and to railway shunting yard No.720 of ISD Dunaferr ZRT. Distance from port to shunting yard No.720. is about 13 kmtr.

There is only a vertical quay wall in the port, with a total length of 563.1 meters, which is divided between the six terminals as follows:

Terminal number	From(m)	To(m)	Purpose
1	0	93	bulk and general cargo handling, idle
2	93	183	bulk and general cargo handling, idle
3	183	279	bulk and general cargo handling, idle
4	279	372	bulk and general cargo handling, idle
5	372	465	bulk and general cargo handling, idle
6	465	558	bulk and general cargo handling, idle

Table 25: Terminals in the port

Figure 32: Vertical quay with loading facility for grains

7.1.2.5 Port's storage facilities

One terminal -operated by Centroport Ltd.- is dedicated to agro-logistic river/rail/road, transhipments, covered /1600 sqm/ flat grain storage at Port of Dunaújváros.

Grain hopper is able to store 6.300 mto bulk cargo at the same time, with mobile separation walls dividing it into four sections. The matrix technology is computer controlled. The point is that it can be used in road, rail and waterway transport alike.

Figure 33: Loading in winter conditions

There are several elements in the loading technology which are unique in Hungary – and perhaps in Europe.

For instance, a special feature is that – as appeared to the former techniques – the ship does not need to be shifted, a bridge structure is moving on the wharf parallel to the ship, and load the holds continuously.

Loading rate 200 t/hour, for shipping is 3.000 mto pwwd shinc, which is 1.000 mto per shifts.

Figure 34: Storage for grains

7.1.3 Port of Baja

7.1.3.1 Position

Baja:

Baja is situated in the heart of Europe, 30 km-s from the south Hungarian border to Serbia. The proximity of the Danube and the favourable geographical location of the city cause outstanding attention in the field of transportation worldwide. Baja is one of the main traffic junctions not just in Hungary but in the whole Bácska region. The city is the centre of the south Hungarian agricultural region and plays important role in the food- and light industrial sector. Baja is waiting for its visitors with prosperous touristic and business opportunities. The potential investors find well developed infrastructural facilities in the Port of Baja and the Industrial Park as well.

Port:

The Port of Baja and Intermodal Logistic Service Centre, one of the most important Hungarian strategic port, is located on the left bank of the Danube between the river kilometres 1479+140 and 1480+900, which has direct road and rail connection and is available on inland waterway from the North and the Black Sea as well. We pay special attention to the environment protection; from our 9 terminals you can find Ro-Ro service, which ensures combined transportation between road and waterway. The port also utilize a „Green Terminal", which collects ship borne waste (dead oil, oily and bilge water, oily clothes and filters, storage battery) and gives drinking water and electric current if it is needed. The port offers a whole scale logistic service for its customers, such as goods- and container handling, loading and unloading, warehousing, storing, customs and financial services, phytosanitary station, container and ship repairing, forwarding, etc.

Overview of basic port's features are given in the below table.

Parameters	Explanation / Value
Port land owner (State, Region, Municipality, Private, Other)	State/Municipality/Private (33,3 % each)
Port authority name	Baja Public Port Ltd
Number of operators (concessionaires, lessors)	6
Total port area (ha)	208 795m2
Maximum draught (m) - natural or dredged	The definition of international water transport is 16dm even for the smallest water.
Total number of terminals	9
Heavy lift and out-of-gauge handling capacity	yes

Parameters	Explanation / Value
(Yes/No)	
Ability to handle full block train along the quay (Yes/No)	yes
Ability to handle full block train in the port area (Yes/No)	yes
Transhipment equipment for intermodal transport (Yes/No)	yes
Total quay length (vertical + sloped) (m)	1300 m
Vertical quay length (m)	444m
Sloped quay length (m)	600m
Undeveloped quay length (m)	350m
Max number of vessels handled at the same time	8
Max capacity of anchorage or waiting area for barges (number)	Anchoring is available with ample by full loading capacity too
Storage capacity (m2)	1500m2 open air, 4100m2 covered open storage, 7000m2 covered warehousing facilities
Storage capacity for liquid cargos (m3)	no
Storage capacity (TEU)	-
Storage capacity (CEU - car equivalent unit, for Ro-Ro terminals)	Parking space for trucks in Ro-Ro 120, Other: 37
Bunkering facilities within the port area (Yes/No)	no
Shore-side power supply for vessels (Yes/No)	yes
Road conneection (Yes/No)	yes
Rail connection (Yes/No)	yes
Number of quay cranes of lifting capacity Q < 10 tons	1
Number of quay cranes of lifting capacity 10 < Q < 16 tons	-
Number of quay cranes of lifting capacity 16 < Q <	1

Parameters	Explanation / Value
50 tons	
Number of quay cranes of lifting capacity Q > 50 tons	-
Total number of quay cranes	2

Table 26: Basic features of the Port of Baja

7.1.3.2 Ownership, administration (governance) and operation

The owners of the Baja Public Port Ltd. are the Hungarian National Asset Management Inc. (Hungarian State), the Municipality of Baja and ÁTI DEPO Plc. Each entity has 33,33% share of the company.

7.1.3.3 Hinterland connections

Baja is located on the western border of the region, on the left bank of the Danube, with an administrative area of 177.6 km2. The city is avoided by the main road and railway lines, so it is also peripherally located in terms of transport, but it is also an important transport hub, as it connects the southern regions of the country here. The port of Baja is one of the most important river ports on the southern border of the European Union, as well as the north-south main road 51 and the east-west main road 55.

Figure 35: Hungarian transport network

7.1.3.4 Port infrastructure

The port of Baja currently has 9 terminals, of which 8 are economic loading bays, and the ninth is a port for the neutralization of environmentally harmful waste and hazardous substances generated by watercraft. The 8 economic port units are the following: 1 Ro-Ro terminal, 1 heavy lift loader, 1 two-line container loader, 3 grain loaders, 1wood loading port, 1 gravel-sand bulk cargo. At present, all of our ports are licensed to operate, satisfying the good service of both the authorities and the users. In addition to pollutants and waste, we can provide water and electricity, there are currently no bunkering facilities. We can provide a full trimodal service of goods, which means that we can reload goods transported by road, rail and water in any ratio and variation.

In addition to modern new technologies, we also have less modern or low-capacity technologies, so it has become necessary to develop the technological and quantitative services of the port service, especially for railway services. We are developing the railway service within the framework of an existing EU tender, we are building a new part of the shore wall, which includes the construction of a heavy loading capacity with a capacity of 100 tons, the construction of a new approach road and truck parking and the technological development of the green port, too.

7.1.3.5 Port storage facilities

In our port, the storage capacity has developed according to the typically loaded goods. The agricultural environment specializes mainly in the handling, storage and loading of self-produced agricultural products produced in the region. The three-quoters of the trade is based from the mentioned goods. That's why our storage capacity consists largely of silos and flat warehouses providing multi-purpose storage. Other products that are less sensitive to the weather are stored outdoors in solid, paved areas, these can be bulk goods, big bags, containers of various sizes, wagons, trucks.

7.2 Railways of relevance for IWT

This section does not refer to the railways which are physically connecting the port gate with the rest of the railway network as they are assessed in deliverable D.T2.2.1, but to the major and important railway sections of different corridors passing close enough to the ports analyzed in previous section to have an impact to those ports.

7.2.1 Railway section Dombóvár – Pusztaszabolcs

This is the closest railway line to the ports of Baja and Dunaújváros, which is part of the European Union transit route. The condition of the track has improved in many sections in recent years, but in some places still needs to be improved to meet the desired parameters.

Section	Parameter	Value	Unit	Reference in Regulation 1315/2013
Dombóvár Pusztaszabolcs	Length	111	km	n/a
	Electrification	100	% of km	§12 except for isolated networks
	Track gauge 1435mm	100	% of km	§13 as priority for RR infrastructure development
	Line speed >= 100km/h	100	% of km	§39 requirement for core network
	Axle load (>=22.5t)	0	% of km	
	Train length (740m)	0	% of km	

Table 27: Dombóvár – Pusztaszabolcs railway section parameters

7.2.2 Railway section Budapest Kelenföld – Budapest Ferencváros

It is the fastest route by train to all three EU international freight corridors in the country. This line is the busiest section in Hungary, with 90% of east-west rail traffic passing through here. It is currently being expanded for 3 or 4 tracks in some places.

Section	Parameter	Value	Unit	Reference in Regulation 1315/2013
Budapest Kelenföld – Budapest Ferencváros	Length	5,88	km	n/a
	Electrification	100	% of km	§12 except for isolated networks
	Track gauge 1435mm	100	% of km	§13 as priority for RR infrastructure development
	Line speed >= 100km/h	0	% of km	§39 requirement for core network
	Axle load (>=22.5t)	0	% of km	
	Train length (740m)	100	% of km	

Table 28: Kelenföld – Ferencváros railway section parameters

7.2.3 Railway section Budapest Ferencváros – Cegléd

Section	Parameter	Value	Unit	Reference in Regulation 1315/2013
Budapest Ferencváros – Cegléd	Length	67.3	km	n/a
	Electrification	100	% of km	§12 except for isolated networks
	Track gauge 1435mm	100	% of km	§13 as priority for RR infrastructure development
	Line speed >= 100km/h	100	% of km	§39 requirement for core network
	Axle load (>=22.5t)	100	% of km	
	Train length (740m)	100	% of km	

Table 29: Ferencváros – Cegléd railway section parameters

7.3 Roads of relevance for IWT

This section does not refer to the roads which are physically connecting the port gate with the rest of the road network as they are assessed in deliverable D.T2.2.1, but to the major and important road sections of different corridors passing close enough to the ports analyzed in previous section to have an impact to those ports.

7.3.1 Road section Nagytétény – Némediszőlő

The motorway close to the port of Csepel and BILK, on which the Rhine-Danube, Mediterranean and Orient transit corridors pass. It also provides quick and easy access to southwest, west and east directions. The highways are of good quality that meet the required expectations.

Category / Section	Parameter	Value	Unit
Motorway M0 / Nagytétény- Némediszőlő	Length	19,5	km
	Number of lanes (total, in both directions)	4	lanes
	Maximum speed allowed	110	km/h
	Axle load for trucks allowed	10	t/axle

Table 30: Nagytétény – Némediszőlő road section parameters

7.3.2 Road section Budapest – Kecskemét

Continuation of the previous section. This is the closest section of the transit routes to the port of Dunaújváros.

Category / Section	Parameter	Value	Unit
Motorway M5 / Budapest - Kecskemét	Length	68,4	km
	Number of lanes (total, in both directions)	4	lanes
	Maximum speed allowed	130	km/h
	Axle load for trucks allowed	10	t/axle

Table 31: Budapest – Kecskemét road section parameters

7.3.3 Road section Bátaszék – Budapest

It does not belong to any European transit route, but this motorway is the closest to both the ports of Baja and Dunaújváros. The motorway does not yet reach the border, but it leads unhindered to Budapest, where it is connected to several transit corridors.

Category / Section	Parameter	Value	Unit
Motorway M6 / Bátaszék - Budapest	Length	148	km
	Number of lanes (total, in both directions)	4	lanes
	Maximum speed allowed	130	km/h
	Axle load for trucks allowed	10	t/axle

Table 32: Bátaszék – Budapest road section parameters

7.4 Multimodal terminals outside of ports

Multimodal terminals within ports are analysed in deliverable D.T2.1.1: “Multimodal facilities and services”. Therefore, this section in this report will tackle multimodal terminals close to, but outside of ports, which can have an impact on the throughput of a nearby port or even its development plans.

7.4.1 Multimodal terminal BILK

The Budapest Intermodal Logistics Center is located 10 km by road from the Csepel Freeport. It still handles significant freight traffic by rail and truck. The logistics center is provided by Wáberer's Holding Zrt. (70%) And to a lesser extent by Rail Cargo Terminal BILK Zrt. (30%). The logistics center provides a wide range of warehousing services in both truck and rail freight and warehousing. The center is an integral part of a significant directional network. they are in direct contact with several major European ports (Hamburg, Brémerhaven, Koper, Trieste, Rijeka, ARA) and similar terminals (Wels, Duisburg, Vienna, Kürtös, Arad). It currently serves 55-60 directional trains per week. In addition, it provides additional ad hoc directional trains and the handling of wagonload combined rail consignments. The center allows reloading of containers, swap bodies, and semi-trailers.

Figure 36: Bilk multimodal terminal view

Source: bilk.hu

Terminal infrastructure characteristics	Value	Unit/ Description	Notes
Total area	207 000	(m^2)	
Handling capacity	220 000	TEU/year	
Storage area	184 000	(m^2)	
Depot (base) storage capacity	6000	TEU	
Capacity to handle block-trains	yes	(Yes/No)	

Terminal infrastructure characteristics	Value	Unit/ Description	Notes
Maximum length of complete block-train	750	(m)	
Number of rail sidings for loading/unloading	5	(n)	
Total length of rail sidings for loading/unloading	3750	(m)	
Electrified train accessibility	yes	(Yes/No)	
Number of road lanes for truck traffic	n/a	(n)	
Number of road lanes for truck loading/unloading	n/a	(n)	
Parking space for trucks / semitrailers	384	(n)	

Table 33: BILK terminal parameters

8 Transport infrastructure status quo in Croatia

8.1 Ports

8.1.1 Port of Vukovar

8.1.1.1 Position

Vukovar port is situated on 1335 km of the Danube river, on its right bank. Port stretches towards the East and West and it is 1700m long and 45m wide. The port is very well situated to the main current of the river Danube, which makes it possible for the port to be navigable during the whole year regardless of water level, so even during the period of the lowest water levels of the Danube, the port is operational and active.

Overview of basic port's features are given in the below table.

Parameters	Explanation / Value
Port land owner (State, Region, Municipality, Private, Other)	State and Private owner partially
Port authority name	Port Authority Vukovar
Number of operators (concessionaires, lessors)	4
Total port area (ha)	26
Maximum draught (m) - natural or dredged	2,6
Total number of terminals	7
Heavy lift and out-of-gauge handling capacity (Yes/No)	Yes
Ability to handle full block train along the quay (Yes/No)	Yes
Ability to handle full block train in the port area (Yes/No)	Yes
Transhipment equipment for intermodal transport (Yes/No)	Yes
Total quay length (vertical + sloped) (m)	1560
Vertical quay length (m)	1300
Sloped quay length (m)	260

Parameters	Explanation / Value
Undeveloped quay length (m)	300
Max number of vessels handled at the same time	7
Max capacity of anchorage or waiting area for barges (number)	
Storage capacity (m2)	18000
Storage capacity for liquid cargos (m3)	11000
Storage capacity (TEU)	n/a
Storage capacity (CEU - car equivalent unit, for Ro-Ro terminals)	n/a
Bunkering facilities within the port area (Yes/No)	Yes
Shore-side power supply for vessels (Yes/No)	Yes
Road connection (Yes/No)	Yes
Rail connection (Yes/No)	Yes
Number of quay cranes of lifting capacity Q < 10 tons	2
Number of quay cranes of lifting capacity 10 < Q < 16 tons	0
Number of quay cranes of lifting capacity 16 < Q < 50 tons	1
Number of quay cranes of lifting capacity Q > 50 tons	1
Total number of quay cranes	4

Table 34: Basic features of the Port of Vukovar

8.1.1.2 Ownership, administration (governance) and operation

Vukovar cargo port is defined as a public good of special interest for the Republic of Croatia. Port is categorized as an international, public port and (due to AGN) an E-port. Theoretically, land and infrastructure owner can be anyone, but intention is that owner is the State and Port Authority is a public body who manages the port area on behalf of the State. Port Authority is in charge for planning, building and maintenance of the infrastructure in the Port. Port operators can do only activities that are defined as “port activities” which are specified in Law on Inland Navigation and Inland Ports.

Port Authority gives a concession to port operators for public port services. Concessions are given through a public procurement procedure.

Land and infrastructure are owned mostly by the State (85%), partially by the private operator (10 %) and by the local authority (City of Vukovar) (5%).

8.1.1.3 Hinterland connections

Port of Vukovar is connected to the cities of Županja, Vinkovci and Brčko (Bosnia and Herzegovina) via M55 road. The same road connects it to the highway E-75 connecting Zagreb and Belgrade (Republic of Serbia). It is also connected with road M2 with city of Osijek and with corridor VC (Budapest-Osijek-Sarajevo-Ploče). The port is located on Danube River that is Pan European corridor VII and it is part of the Rhine-Danube Core Network Corridor.

8.1.1.4 Port infrastructure

The total area of the port area of Vukovar is 26 hectares, and the length of the operational shore under the concession of Luka Vukovar Ltd, which includes four berths, is 450 m. The terminal is located on a total area of 3.8 ha. There are three operational railway tracks for ship-shore handling and loading / unloading of general and bulk cargo with a total length of approximately 1,630 m. Maintenance of industrial tracks, as well as maintenance of manipulative and road surfaces is carried out every year.

Port operator Vupik plus Ltd have concession on terminal for loading and unloading of cereals and oilseeds in Vukovar consists of a vertical bank 205 m long, capable of accommodating river vessels and barges up to 3,000 tons and 120 m long. Loading and unloading of ships and barges is possible 24 hours a day. The terminal is completely connected to the silo and loading and unloading capacities on the railway, as well as to the truck loading and unloading capacities. The purpose of the terminal is loading, unloading, reloading, transfer and storage of bulk cargo (cereals and oilseeds).

Port operator Nautica Vukovar Ltd on terminal for liquid cargo provides port activities regarding the supply of fuel and lubricants, transhipment and storage of petroleum products, port-agency and forwarding operations and has 100 m of operational slop shore and one berth.

Port operator Crodux derivati Ltd has a terminal for transhipment, storage and transfer of petroleum products, an operational shore of 75 m with one berth and the type of shore is sloping shore + pontoon.

8.1.1.5 Port storage facilities

The terminals operate by Luka Vukovar Ltd has two gantry cranes with a load capacity of 5/6 t, a port gantry crane with a capacity of 63 t, which has the special feature that it allows handling of heavy loads, as well as general and bulk cargo, as well as 20-foot

and 40-foot containers. It also has forklifts with a capacity of 2 to 20 tons (a total of 8 forklifts), two loaders, a diesel locomotive, as well as a thruster of 300 hp.

The port operator Luka Vukovar Ltd has a closed storage area of 3,000 m2 and an open storage area of 15,000 m2.

The terminal Vupik plus Ltd has a mechanical elevator and conveyors, a capacity of 200 t / h (wheat 0.75 t / m^3) and an automatic system for moving boats, two own industrial tracks with a total length of 620 m and a truck parking lot with a capacity of 50 parking spaces. Considering that the investment at the terminal was realized during 2012, it is a very modern building with a maximum annual capacity of transhipment of goods up to 300,000 t, while the maximum storage capacity is 48,000 t.

Terminal Nautica Vukovar d.o.o. has two floating facilities with a total fuel tank capacity of 4,400 m2. Among other equipment, the company has pumps, measuring devices, a weighbridge, and its own industrial track with a useful length of 340 m. The maximum annual capacity is 100,000 t.

The terminal of Crodux derivati d.o.o. has a floating facility 75 m long and 4 land fuel tanks with a total capacity of 8,000 m^3, while other equipment the company has pumps and measuring devices and a truck parking lot with a capacity of 10 parking spaces and its own industrial track length of 240 m. Maximum annual transhipment capacity is 100,000 m^3.

8.2 Railways of relevance for IWT

This section does not refer to the railways which are physically connecting the port gate with the rest of the railway network as they are assessed in deliverable D.T2.2.1, but to the major and important railway sections of different corridors passing close enough to the ports analysed in previous section to have an impact to those ports.

Within the territory of the Republic of Croatia, international Corridor named as RH1. TEN-T core network (Paneuropean Corridor X), Salzburg –Thessaloniki, according to the Decision of the Classification of the Railway Lines of the Government of the Republic of Croatia (OG no. 03/14) presents railway of international significant. Furthermore, the corridor has great role in connection to Inland Waterway transport, especially for the Port of Vukovar. Railway M601 (Vinkovci - Vukovar) classified as international railway that connects Port of Vukovar with the corridor RH1.

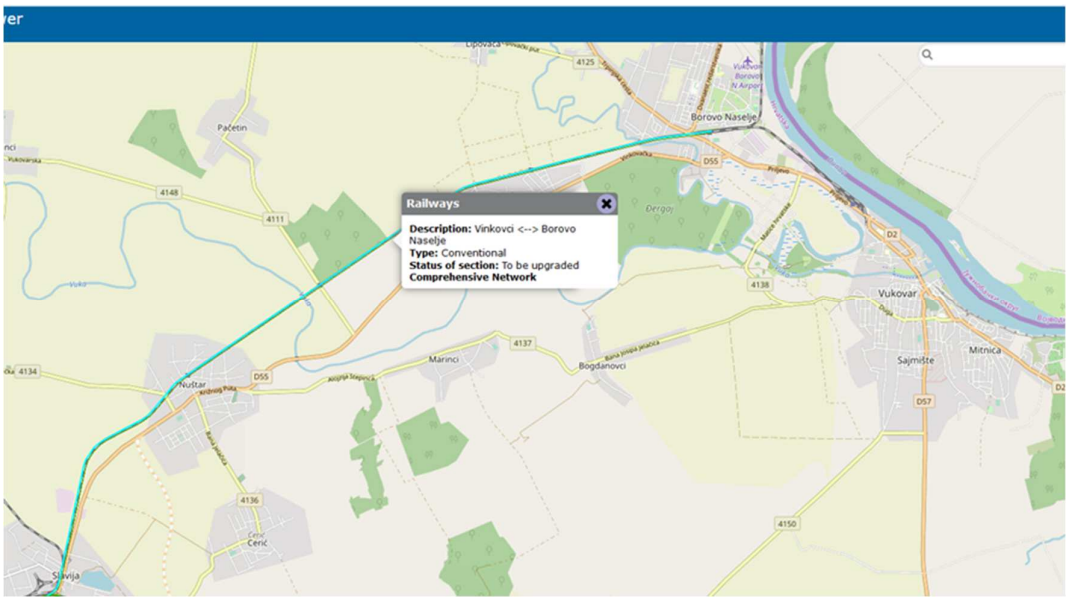

Figure 37: Railway M601 (Vinkovci – Vukovar)

8.2.1 Railway section M601 (Vinkovci - Vukovar)

The M601 Vinkovci -Vukovar railway serves as a railway connecting the RH1 and the only Croatian inland port of the basic TEN-T network on the Danube, Vukovar. This line is important for freight traffic and must meet the minimum technical criteria in terms of axle load and useful length of receiving and dispatching tracks, therefore the line is currently in the process of reconstruction and modernization.

Section	Parameter	Value	Unit	Reference in Regulation 1315/2013
Vinkovci - Vukovar	Length	18,7	km	n/a
	Electrification	0	% of km	§12 except for isolated networks
	Track gauge 1435mm	100	% of km	§13 as priority for RR infrastructure development
	Line speed >= 100km/h	0	% of km	§39 requirement for core network
	Axle load (>=22.5t)	0	% of km	
	Train length (740m)	unknown	% of km	

Table 35: Vinkovci – Vukovar railway section parameters

8.3 Roads of relevance for IWT

This section does not refer to the roads which are physically connecting the port gate with the rest of the road network as they are assessed in deliverable D.T2.2.1, but to the major and important road sections of different corridors passing close enough to the ports analysed in previous section to have an impact to those ports.

The A3 motorway, which is an integral part of TEN-T's core network and is located on Pan-European Corridor X. According to the national classification road A3 (Bregana cross-border Slovenia – Zagreb – Sl. Brod – cross-border Bajakovo) is classified as motor-highway, while road D55 (Borovo – Vinkovci – Županja (cross border with Bosnia and Herzegovina) is classified as public state road.

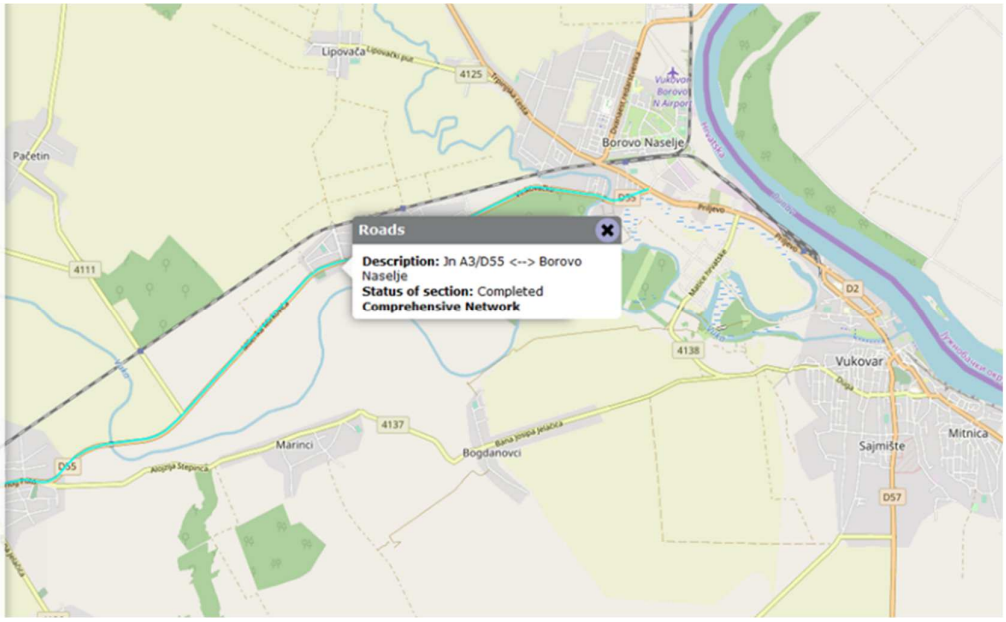

Figure 38: State road D55 (Borovo-Vinkovci-Županja)

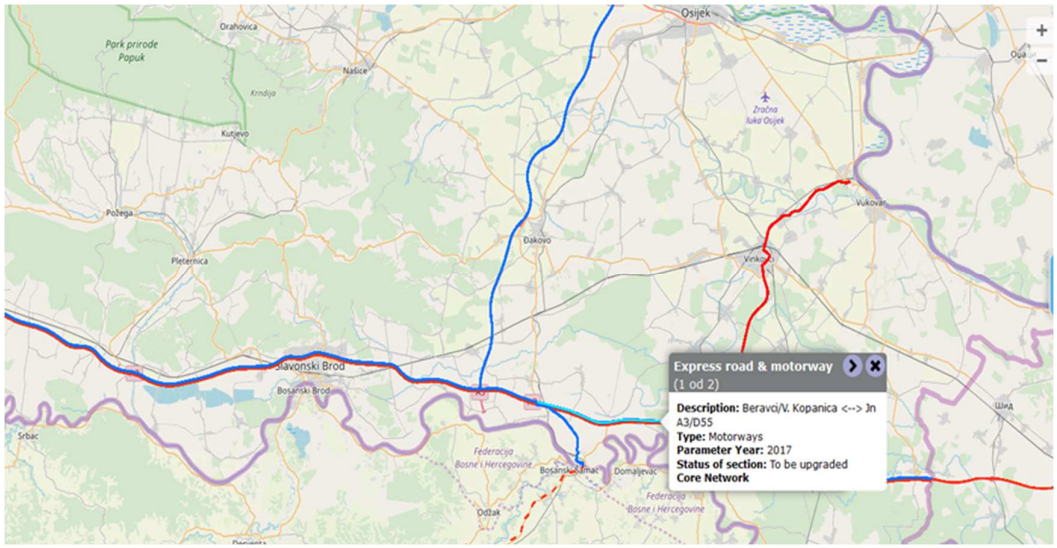

Figure 39: A3 Highway (Bregana-Zagreb-Slavonski brod -Bajakovo)

8.3.1 Road section A3 (Bregana –Zagreb-Slavonski Brod – Bajakovo)

A3 Highway classified as public state road and forms part of Pan European corridor X, that connect Eastern and Western Europe.

Category / Section	Parameter	Value	Unit
Motorway A3 / Bregana - Bajakovo	Length	306	km
	Number of lanes (total, in both directions)	6	lanes
	Maximum speed allowed	130	km/h
	Axle load for trucks allowed	11,5	t/axle

Table 36: Bregana – Bajakovo road section parameters

8.4 Multimodal terminals outside of ports

Multimodal terminals within ports are analysed in deliverable D.T2.1.1: “Multimodal facilities and services”. Therefore, this section in this report will tackle multimodal terminals close to, but outside of ports, which can have an impact on the throughput of a nearby port or even its development plans.

In Croatia, however, there are no data available on any nearby multimodal terminals.

9 Transport infrastructure status quo in Serbia

9.1 Ports

9.1.1 Port of Bogojevo

9.1.1.1 Position

The port of Bogojevo is located on the left bank of the Danube from km 1366,73 to km 1367,42.

This port is located at a distance of 4 km from the village of Bogojevo and 34 km downstream from the town of Apatin. The location of the port in Bogojevo has an extremely favorable position, both in relation to the settlement of Bogojevo and business entities in the West Bačka District (City of Sombor and the municipalities of Apatin, Odžaci and Kula), and in relation to the wider area and Mali Iđoš in the North Bačka District, as well as the Municipality of Vrbas in the South Bačka District).

Location of Port of Bogojevo is shown in the below figure.

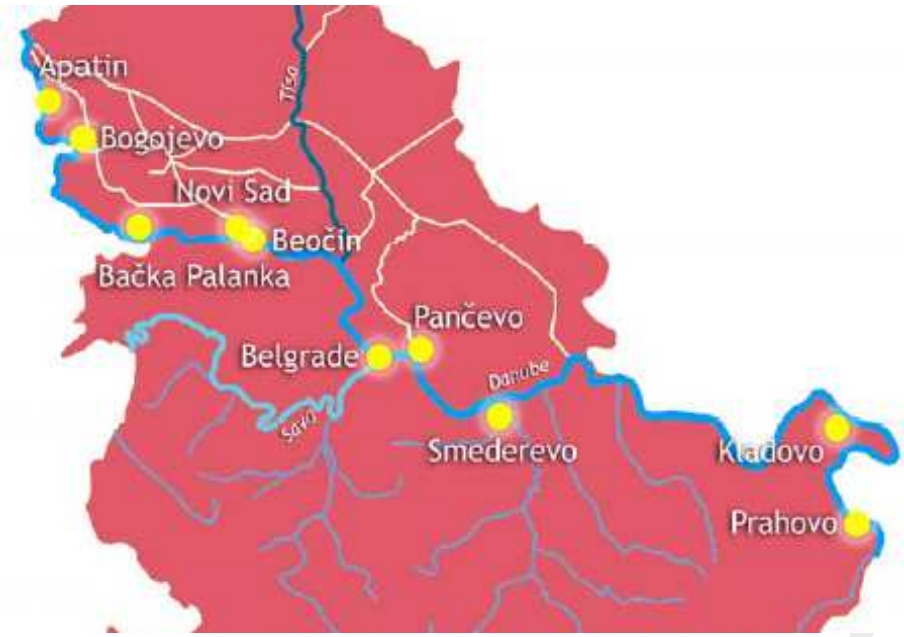

Figure 40. Danube ports in Serbia

Source: Wanda project

Overview of basic port's features are given in the below table.

Parameters	Explanation / Value
Port land owner (State, Region, Municipality, Private, Other)	State owned
Port authority name	Port Governance Agency
Number of operators (concessionaires, lessors)	1
Total port area (ha)	9,05
Maximum draught (m) - natural or dredged	4
Total number of terminals	1
Heavy lift and out-of-gauge handling capacity (Yes/No)	NO
Ability to handle full block train along the quay (Yes/No)	NO
Ability to handle full block train in the port area (Yes/No)	NO
Transhipment equipment for intermodal transport (Yes/No)	N/A
Total quay length (vertical + sloped) (m)	210
Vertical quay length (m)	90
Sloped quay length (m)	120
Undeveloped quay length (m)	0
Max number of vessels handled at the same time	2
Max capacity of anchorage or waiting area for barges (number)	6
Storage capacity (m2)	silo of 30,000 tons and a closed space place of 10000 m2
Storage capacity for liquid cargos (m3)	N/A
Storage capacity (TEU)	N/A
Storage capacity (CEU - car equivalent unit, for Ro-Ro terminals)	N/A

Parameters	Explanation / Value
Bunkering facilities within the port area (Yes/No)	NO
Shore-side power supply for vessels (Yes/No)	YES
Road connection (Yes/No)	YES
Rail connection (Yes/No)	NO
Number of quay cranes of lifting capacity Q < 10 tons	
Number of quay cranes of lifting capacity 10 < Q < 16 tons	1
Number of quay cranes of lifting capacity 16 < Q < 50 tons	
Number of quay cranes of lifting capacity Q > 50 tons	
Total number of quay cranes	

Table 37: Basic features of the Port of Bogojevo

9.1.1.2 Ownership, administration (governance) and operation

Republic of Serbia is the owner of the port land, while the infrastructure is owned by the private company operating the port. In 2013 Government of the Republic of Serbia established the Port Governance Agency that is in charge of management and development of all ports and harbours in the Republic of Serbia. Agency is responsible for determination of port areas, port concession agreements, licensing of port operators etc. Currently, there is one licensed port operator in the Port of Bogojevo - Luka Dunav Bogojevo D.O.O.

9.1.1.3 Hinterland connections

The micro-location of the existing port of Bogojevo is defined by the exit to the water body of the international waterway of the Danube River, with the existing infrastructure and suprastructural capacities on the mainland part of the port.

On the northeast side, the micro location is limited by the existing state road IIa row no. 107, Sombor - Apatin - Bogojevo, while on the southeast side there is a road and next to it a railway bridge over the Danube, towards the Republic of Croatia. State road no. 107 is located on the embankment and the defensive line from the flood waters of the Danube. Right next to the road bridge is the border crossing Bogojevo, with minimal capacities and facilities for control and transfer of passenger and freight vehicles. The northwest side of the site of the port of Bogojevo is limited by an

uncategorized road and the border of the municipality of Odzaci with the municipality of Apatin (KO Sonta).

The port complex is surrounded by the main road Bogojevo-Erdut in the east, regional road Bogojevo-Senta in the north and local road in the west. The port is connected with the regional road Bogojevo-Apatin-Sombor-Subotica, as well as with the section Bogojevo-Odzaci-Sombor of the main road No. 3, which passes through Serbia.

Across the road bridge, the Port is connected to the section of road No. 3 Erdut-Dalj-Osijek in Croatia. The main road corridor is the main road that turns from the bridge from Croatia to the narrower city zone of Bogojevo, enters the center as a city road and then exits again as a main road in the northeast direction towards Odzaci.

The port is 40 km away from the E75 highway, in the direction Belgrade-Budapest, and is not connected to the national railway network.

Within the built capacities of the traffic infrastructure in the port zone, there is also a manipulative railway no. 403, Bogojevo - Danube bank, with 3 industrial tracks in the area of port aquatory.

9.1.1.4 Port infrastructure

The port covers surface of approximately 9ha. Port of Bogojevo –is an open-type port with maximum available draft maintained at 4 meters Total quay length is 210m, out of which vertical quay is approximately 90m. Two vessels can be simultaneously accommodated and serviced. Anchorage has the capacity to accommodate 6 vessels.
There is already a built infrastructure in the port, which ensures the functioning of port activities. On the filled plateau behind the operational shore, a grain silo, a dryer, closed and open warehouses, a truck scale weighing system, an administrative building and gates were built. The face of the operational shore towards the open flow is represented by a vertical quay construction on piles 89 m long, while the operational shore is about 12 m wide at an approximate elevation of 86.56 m above sea level. A gantry crane is used for cargo handling, while the grain is loaded from the silo with a belt conveyor. From the communal infrastructure, there is a water supply and sewerage network, electric power infrastructure with a transformer station, gas supply infrastructure and electronic communication network.

9.1.1.5 Port storage facilities

The port has silo of 30,000 tons and 10.000m2 of covered storage space available for port users.
The main types of cargo handled in port are grains, chemical fertilizers, gravels and sand with annual reported volumes between 200,000 and 300,000 tonnes.
In 2019, the port of Bogojevo, with 288,914.65 tons, was the third largest transshipment of grain from all ports in the Republic of Serbia (after the ports of Novi Sad and Pancevo). Transshipment of other cargoes was registered in the port, primarily imported artificial fertilizers. Although a total of 363,714.78 tons of various cargo was transhipped in 2019, the estimated requests for transportation from the

area that gravitates to the port of Bogojevo are many times higher and more diverse than the current possibility of this port to meet those requests.

9.1.2 Port of Bačka Palanka

9.1.2.1 Position

The port of Bačka Palanka is located on the left bank of the Danube River, km 1295 in the agrarian area of South Bačka. It is basin type port, with a water area of 5.2 ha and a minimum depth of 3.5 m at a low navigation level.

Overview of basic port's features are given in the below table

Parameters	Explanation / Value
Port land owner (State, Region, Municipality, Private, Other)	State owned
Port authority name	Port Governance Agency
Number of operators (concessionaires, lessors)	1
Total port area (ha)	74,17
Maximum draught (m) - natural or dredged	4
Total number of terminals	1
Heavy lift and out-of-gauge handling capacity (Yes/No)	NO
Ability to handle full block train along the quay (Yes/No)	NO
Ability to handle full block train in the port area (Yes/No)	NO
Transhipment equipment for intermodal transport (Yes/No)	N/A
Total quay length (vertical + sloped) (m)	322
Vertical quay length (m)	322
Sloped quay length (m)	0
Undeveloped quay length (m)	0
Max number of vessels handled at the same time	3

Parameters	Explanation / Value
Max capacity of anchorage or waiting area for barges (number)	12
Storage capacity (m2)	650 covered and 8.260 open
Storage capacity for liquid cargos (m3)	N/A
Storage capacity (TEU)	N/A
Storage capacity (CEU - car equivalent unit, for Ro-Ro terminals)	N/A
Bunkering facilities within the port area (Yes/No)	NO
Shore-side power supply for vessels (Yes/No)	YES
Road conneection (Yes/No)	YES
Rail connection (Yes/No)	NO
Number of quay cranes of lifting capacity Q < 10 tons	2
Number of quay cranes of lifting capacity 10 < Q < 16 tons	1
Number of quay cranes of lifting capacity 16 < Q < 50 tons	
Number of quay cranes of lifting capacity Q > 50 tons	
Total number of quay cranes	

Table 38: Basic features of the Port of Bačka Palanka

9.1.2.2 Ownership, administration (governance) and operation

Republic of Serbia is the owner of the port land, while the infrastructure is owned by the private company operating the port. In 2013 Government of the Republic of Serbia established the Port Governance Agency that is in charge of management and development of all ports and harbours in the Republic of Serbia. Agency is responsible for determination of port areas, port concession agreements, licensing of port operators etc. Currently, there is one licensed port operator in the Port of Bačka Palanka - Luka Bačka Palanka D.O.O.

9.1.2.3 Hinterland connections

The port is 30 km away from the E70 highway, direction Belgrade-Zagreb, and 45 km from the E75 highway, direction Belgrade-Budapest. The port is not connected to the national railway network, but is far away about 5 km from the regional railway Bačka Palanka – Gajdobra that is connected with the Belgrade-Subotica railway and further with the Budapest.

There are two state roads near the Port of Bačka Palanka of Ib class which extend to the borders of Bosnia and Herzegovina and Romania: state road 19 connecting Port Bačka Palanka with Bosnia and Herzegovina at Sremska Rača (Neštin-Erdevik-Kuzmin-Sremska Rača) and state road 12 connecting Port Bačka Palanka with Romania (Subotica - Sombor - Odzaci - Backa Palanka - Novi Sad - Zrenjanin - Zitiste - Nova Crnja - state border with Romania –border crossing Srpska Crnja). However, section Bačka Palanka – Neštin (State Road 12) is unconstructed, while Neštin – Erdevik section wait to be fully constructed – 7.262 km unconstructed.

Also one road of IIa class, row number 108 is connecting Port of Bačka Palanka with Croatia: - Bačka Topola - Kula - Despotovo - Silbas - Gajdobra - Bačka Palanka - state border with Croatia (border crossing Bačka Palanka).

An important direction of regional and inter-municipal connection on the territory of the municipalities of Bačka Palanka (to which Port of Bačka Palanka belongs) are also state roads of the IIb class order:

- number 306: Gajdobra - Čelarevo (state road of IIb class with label 306).

- other roads also of IIb class with the following directions:

  - Backo Novo Selo - Bac - Ratkovo - Silbas - Backi Petrovac- Novi Sad (number 111);

  - Odzaci - Pivnice - Despotovo - Zmajevo - Sirig - Temerin - Zabalj (number 112);

  - (Croatian border) - Neštin - Susek - Beočin - Novi Sad (number 119).

The existing crossing of road/railway infrastructure (bridge) with the corridor of the waterway E80 - Danube near Port of Bačka Palanka is the crossing Bačka Palanka - Ilok which is defined at km 1297.

9.1.2.4 Port infrastructure

The port covers surface of approximately 74 ha. Port of Bačka Palanaka –is port with maximum available draft maintained at 4 meters Total quay length is 322m, all of which is vertical quay. Three vessels can be simultaneously accommodated and serviced. Anchorage has the capacity to accommodate 12 vessels.
The port uses a portal crane, a port mobile crane, a floating crane and a port tugboat to provide port transshipment services. The port provides transshipment services for all types of bulk and general cargo: cereals, mineral fertilizers, scrap iron, gravel, wood and other cargo, in bulk, in bags, jumbo bags, reels, crates, barrels, on pallets and more.

9.1.2.5 Port storage facilities

Storage facilities consists in 8,260 m2 of open spaces and 650 m2 closed spaces. The types of cargo handled in the port are bulk commodities including construction materials, metallurgy products, heavy loads and general cargo.

The port owns the tugboat Kapetan Vinarev, which provides manoeuvring services to its clients. The Agroport Center which belongs to Port of Bačka Palanka also houses storage capacities for receiving and storing 50,000 tons of mineral fertilizers and 30,000 tons for packaged goods, as well as 30,000 tons of storage capacity for mercantile goods. The center has a line for packing mineral fertilizers with a daily packing capacity of 450 tons and a line for packing in a "big bag" with a daily capacity of 500 tons. The daily shipping capacity of packaged mineral fertilizer is 2000 tons.

9.1.3 Port of Prahovo

9.1.3.1 Position

The port of Prahovo is located on the km 861, right bank of the Danube.

Overview of basic port's features are given in the below table.

Parameters	Explanation / Value
Port land owner (State, Region, Municipality, Private, Other)	State owned
Port authority name	Port Governance Agency
Number of operators (concessionaires, lessors)	2
Total port area (ha)	6,76
Maximum draught (m) - natural or dredged	4
Total number of terminals	2
Heavy lift and out-of-gauge handling capacity (Yes/No)	NO
Ability to handle full block train along the quay (Yes/No)	YES
Ability to handle full block train in the port area (Yes/No)	YES
Transhipment equipment for intermodal transport (Yes/No)	YES

Parameters	Explanation / Value
Total quay length (vertical + sloped) (m)	560
Vertical quay length (m)	320
Sloped quay length (m)	240
Undeveloped quay length (m)	0
Max number of vessels handled at the same time	6
Max capacity of anchorage or waiting area for barges (number)	60
Storage capacity (m2)	8000 open space
Storage capacity for liquid cargos (m3)	N/A
Storage capacity (TEU)	N/A
Storage capacity (CEU - car equivalent unit, for Ro-Ro terminals)	N/A
Bunkering facilities within the port area (Yes/No)	YES
Shore-side power supply for vessels (Yes/No)	YES
Road conneection (Yes/No)	YES
Rail connection (Yes/No)	YES
Number of quay cranes of lifting capacity Q < 10 tons	3
Number of quay cranes of lifting capacity 10 < Q < 16 tons	2
Number of quay cranes of lifting capacity 16 < Q < 50 tons	1
Number of quay cranes of lifting capacity Q > 50 tons	
Total number of quay cranes	

Table 39: Basic features of the Port of Prahovo

9.1.3.2 Ownership, administration (governance) and operation

Republic of Serbia is the owner of the port land, while the infrastructure is owned by the private company operating the port. In 2013 Government of the Republic of Serbia established the Port Governance Agency that is in charge of management and development of all ports and harbours in the Republic of Serbia. Agency is responsible for determination of port areas, port concession agreements, licensing of port operators etc. Currently, there is two licensed port operators in the Port of Prahovo – PD Elixir Prahovo and NIS AD Novi Sad.

9.1.3.3 Hinterland connections

The 971 m long industrial and railway track is connecting the port with the national railway network. Port of Prahovo has a connection with two railway sections: Crveni Krst-Zaječar-Prahovo pristanište section and Bor teretna-Prahovo pristanište section. Crveni Krst-Zaječar-Prahovo pristanište section connects port with Bulgaria, while Bor teretna-Prahovo pristanište section connects port with Belgrade and further with Hungary. State road of class IIb No. 400 connects Port of Prahovo with the State road 35 - Dušanovac - Border with Romania near Kusjak.

9.1.3.4 Port infrastructure

The port covers surface of approximately 6,7 ha. Port of Prahovo – is an open type port with maximum available draft maintained at 4 meters Total quay length is 560m, out of which vertical quay is approximately 320m. Six vessels can be simultaneously accommodated and serviced. Anchorage has the capacity to accommodate 60 vessels.

9.1.3.5 Port storage facilities

Storage facilities consists of 8000 m_2 of open spaces. Port of Prahovo has the following facilities and devices: conveyor belt, pneumatic equipment, Ro/Ro-ramp and 6 gantry cranes of 40 tons lifting capacity per each. Of storage facilities there are open storage area, covered storage area and customs warehouse. Maintenance and disposal facilities comprises bunkering facilities, fresh water supply and onshore power supply

9.2 Railways of relevance for IWT

This section does not refer to the railways which are physically connecting the port gate with the rest of the railway network as they are assessed in deliverable D.T2.2.1, but to the major and important railway sections of different corridors passing close enough to the ports analyzed in previous section to have an impact to those ports.

The total construction length of the standard railway (track gauge of 1435 mm) tracks on the territory of "Serbian Railway Infrastructure" a.d. is 3735.8 km, of which 3441.1 km

are single-track and 294.7 km are double-track. Of the stated length, 1759.1 km belong to the conventional railway sections, while 1976.7 km belong to regional, local and manipulative railway sections. A total of 1278.4 km of all railway tracks are electrified.
Rail connections (construction or improvement) to hinterland is of crucial importance since the ports need efficient and reliable connection to their hinterland and the rest of the transport network feeding the ports with their cargoes.
In this document the following railway sections of relevance for IWT will be considered:

1. Bogojevo-state border –Erdut railway section,
2. Bogojevo-Subotica-state border Kelebia,
3. Crveni Krst-Zaječar-Prahovo pristanište section,
4. Bor teretna-Prahovo pristanište

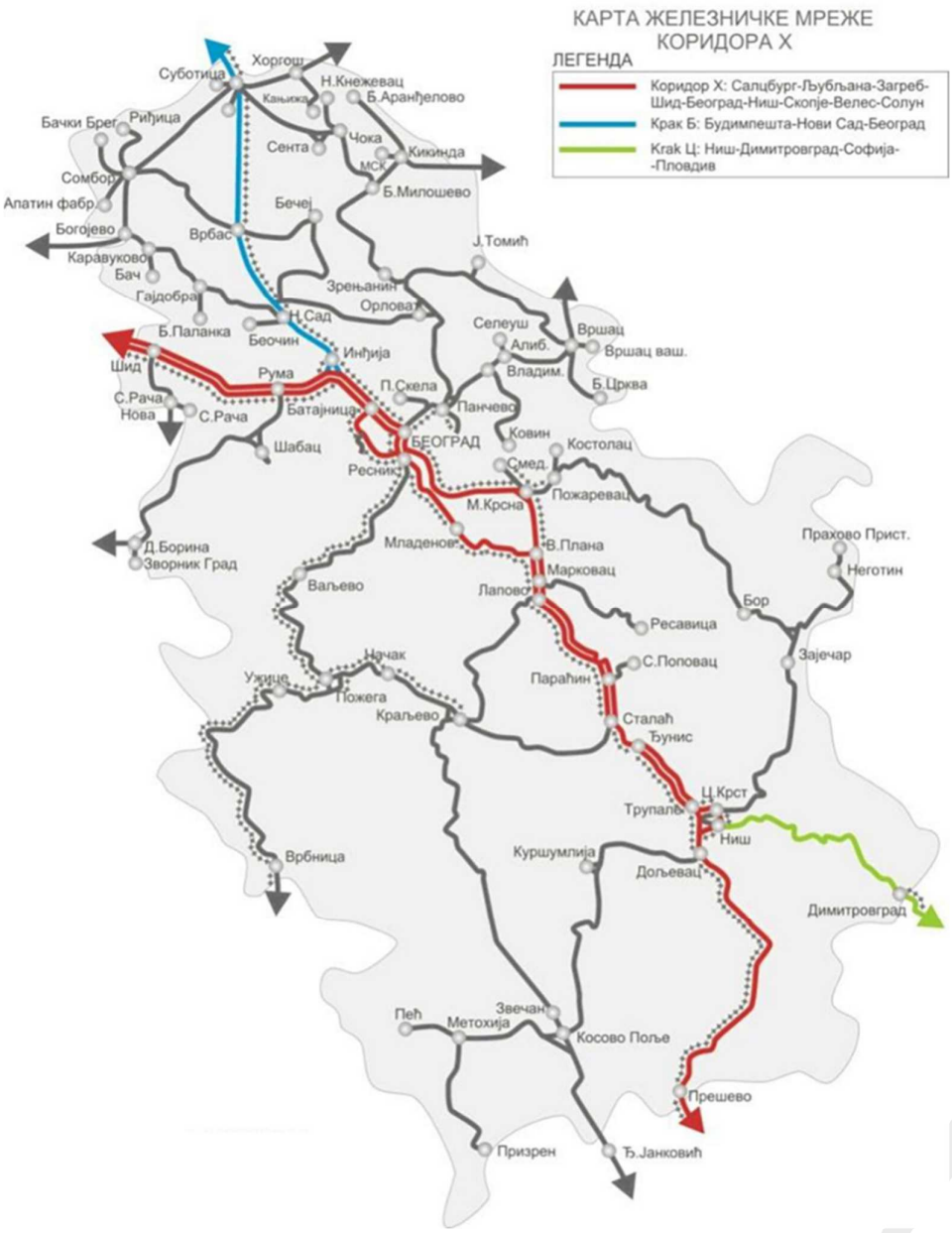

Figure 41. Railway network in Serbia

9.2.1 Railway section Bogojevo - Erdut

Railway section from Bogojevo to state border Erdut connects Port of Bogojevo directly with Croatia and indirectly with Hungary over other railway sections. It is a local railway section and is not electrified. The importance of this section is reflected in possibility to connect Port of Bogojevo with Port of Vukovar and further with Port of Budapest over the following railway sections which are part of the Mediterranean corridor: Osijek – Beli Manastir, Beli Manastir (border) / Magyarboly - Pecs, Pecs –

Dombovar, Dombovar – Pusztaszabolcs, Pusztaszabolcs - Budapest Kelenfold (part 1) and Pusztaszabolcs - Budapest Kelenfold (part 2). This section is mainly used for transport of bulk cargo.

Section	Parameter	Value	Unit	Reference in Regulation 1315/2013
Bogojevo – state border Erdut	Length	10	km	n/a
	Electrification	no		
	Track gauge 1435mm	yes		
	Line speed >= 100km/h	no		
	Axle load (>=22.5t)	n/a		
	Train length (740m)	n/a		

Table 40: Bogojevo-state border Erdut railway section parameters

9.2.2 Railway section Bogojevo - state border Kelebija

Railway section from Bogojevo to Subotica-state border Kelebija is consisted of one regional section (Bogojevo-Sombor-Subotica) and one conventional section (Subotica-Kelebija) 183 km of length. It is important for the Port of Bogojevo because it connects it with Budapest over Hungarian railway sections Kiskunhalas – Kelebia, Kunszentmiklos-Tass – Kiskunhalas and Budapest Ferencvaros. This section is mainly used for transport of bulk cargo.

Section	Parameter	Value	Unit	Reference in Regulation 1315/2013
Bogojevo - Subotica-state border Kelebia	Length	183	km	**n/a**
	Electrification	Yes (Subotica-Kelebia)		
	Track gauge 1435mm	yes		
	Line speed >= 100km/h	no		
	Axle load (>=22.5t)	n/a		

Section	Parameter	Value	Unit	Reference in Regulation 1315/2013
	Train length (740m)	n/a		

Table 41: Bogojevo-Subotica-state border Kelebia railway section parameters

9.2.3 Railway section Crveni Krst - Zaječar - Prahovo pristanište

Crveni krst - Zajecar-Prahovo pristanište is a regional single-track non-electrified railway connected with the main electrified railway (Belgrade - Mladenovac - Lapovo - Niš - Preševo - state border - (Tabanovce)) and a regional single-track railway whose part from Mala Krsna to Požarevac is electrified - Bor – Rasputnica 2 - (Vražogrnac) and single-track non-electrified (- (Rgotina) - Rasputnica 3 - Rasputnica 1 - (Trnavac)). The main advantage of this connection is that cargo from the Port of Prahovo can be transported to Bulgaria.

Cargo transported by this section include: sulfuric acid with more than 51% acid, phosphoric acid, solution, sodium hydroxide, solid, sodium hydroxide, solution, fluorosilic acid, ammonia, anhydrous, ammonate-based fertilizers and petroleum and petroleum products.

Section	Parameter	Value	Unit	Reference in Regulation 1315/2013
Crveni krst - Zajecar-Prahovo pristanište	Length	205	km	n/a
	Electrification	No	% of km	§12 except for isolated networks
	Track gauge 1435mm	yes	% of km	§13 as priority for RR infrastructure development
	Line speed >= 100km/h	no	% of km	§39 requirement for core network
	Axle load (>=22.5t)	n/a	% of km	
	Train length (740m)	n/a	% of km	

Table 42: Crveni krst - Zaječar-Prahovo pristanište railway section parameters

9.3 Roads of relevance for IWT

This section does not refer to the roads which are physically connecting the port gate with the rest of the road network as they are assessed in deliverable D.T2.2.1, but to the major and important road sections of different corridors passing close enough to the ports analyzed in previous section to have an impact to those ports.

The total length of the first and second order roads built on the territory of the Republic of Serbia is 16845 km. The category of state road IA and IB is 971 km, 4502 km respectively. IIA is 7903 km and IIB 3469 km.

Across the road bridge, the Port of Bogojevo is connected to the section of road No. 3 Erdut-Dalj-Osijek in Croatia. The main road corridor is the main road that turns from the bridge from Croatia to the narrower city zone of Bogojevo, enters the center as a city road and then exits again as a main road in the northeast direction towards Odzaci. The port is connected with the regional road Bogojevo – Subotica-state border Kelebia.

The port is 40 km away from the E75 highway, in the direction Belgrade-Budapest.

The port of Backa Palanka is 30 km away from the E70 highway, direction Belgrade-Zagreb, and 45 km from the E75 highway, direction Belgrade-Budapest. There are two state roads near the Port of Bačka Palanka of IB class which extend to the borders of Bosnia and Herzegovina and Romania: state road 19 connecting Port Bačka Palanka with Bosnia and Herzegovina at Sremska Rača (Neštin-Erdevik-Kuzmin-Sremska Rača) and state road 12 connecting Port Bačka Palanka with Romania (Subotica - Sombor - Odzaci - Backa Palanka - Novi Sad - Zrenjanin - Zitiste - Nova Crnja - state border with Romania –border crossing Srpska Crnja).

Bačka Palanka with Croatia: - Bačka Topola - Kula - Despotovo - Silbas - Gajdobra - Bačka Palanka - state border with Croatia (border crossing Bačka Palanka).

State road of class IIb No. 400 connects Port of Prahovo with the State road 35 - Dušanovac - Border with Romania near Kusjak.

In this document the following road sections of relevance for IWT will be considered:

1. Bogojevo-state border – Erdut

2. Bogojevo – Subotica-state border Kelebia

3.Bačka Palanka-Romania-border Srpska Crnja

4.Bačka Palanka – Croatia-border Bačka Palanka

5.Prahovo-Romania

9.3.1 Road section Bogojevo - Erdut

Across the road bridge, the Port of Bogojevo is connected to the section of road No. 3 Erdut-Dalj-Osijek in Croatia. The total length of the bridge connecting Bogojevo and Erdut is 670 meters.

This regional road belongs to IB, No. 17.

Roads categorized as state roads, class IB are 4502 km in total length and are marked with two-digit numbers. They have one lane at each direction, signs are black-on-yellow and the normal speed limit is 80 km/h.

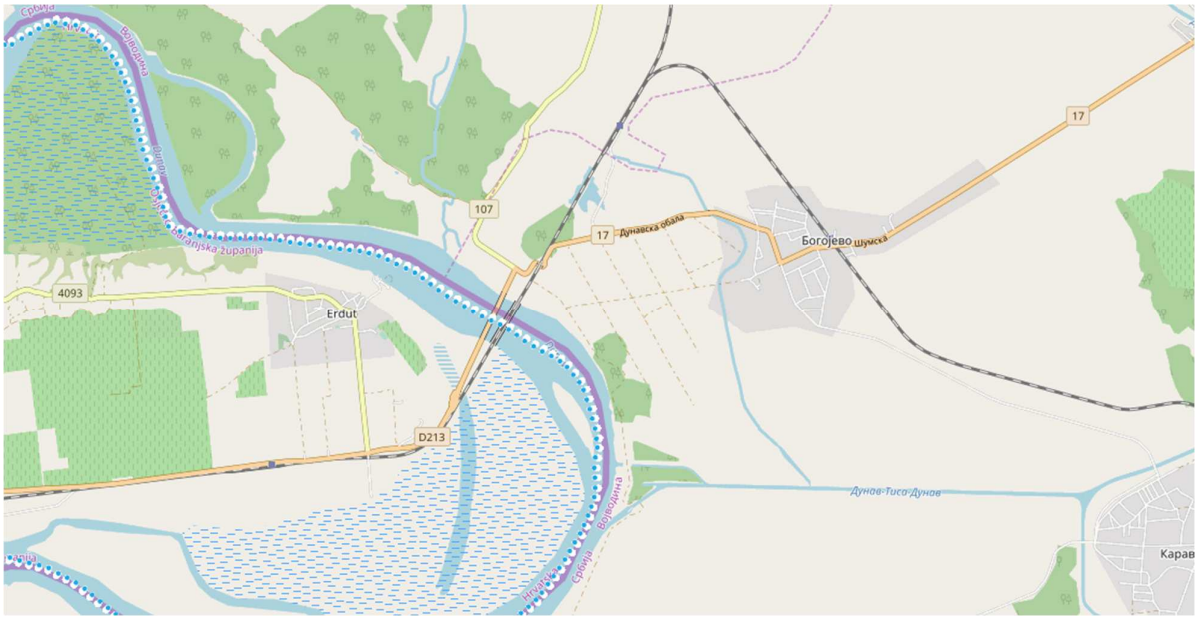

Figure 42: Bogojevo to state border Erdut road section

Category / Section	Parameter	Value	Unit
IB – Bogojevo – border Erdut	Length	10.984	km
	Number of lanes (total, in both directions)	2	lanes
	Maximum speed allowed	80	km/h
	Axle load for trucks allowed	10	t/axle

Table 43: Bogojevo to state border Erdut road section parameters

9.3.2 Road section Bogojevo – Subotica - state border Kelebija)

Port of Bogojevo is connected to Kelebija with road IB. Section Bogojevo-Srpski Miletić is road No. 17, section Srpski Miletić-Subotica is road No. 12. (Total length of road No. 12 is 276km). Section Subotica-Kelebija is road No. 11 (Total length of road No. 11 is 23,677km).

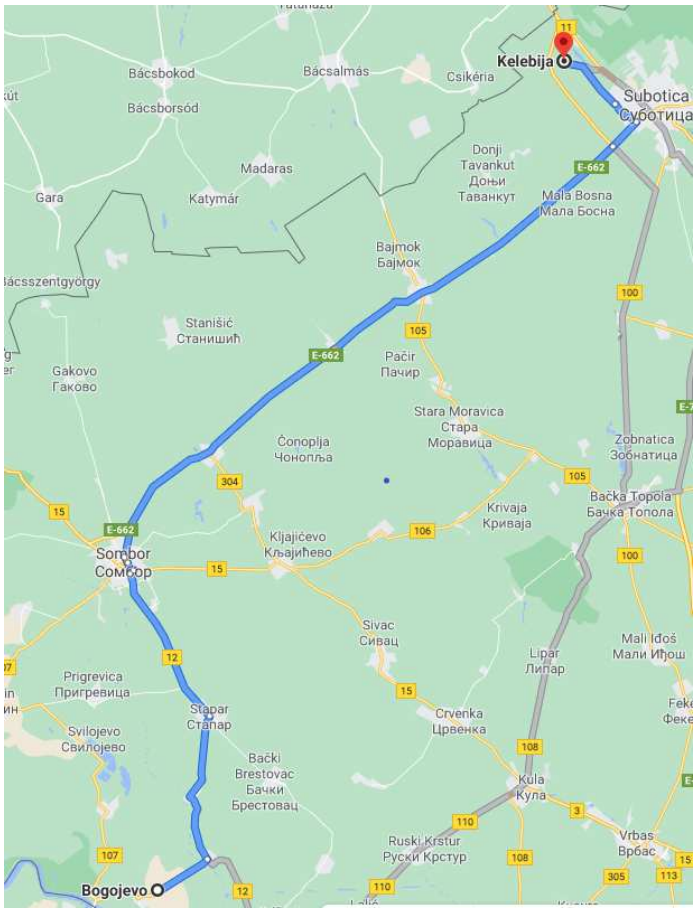

Figure 43: Bogojevo to Subotica-state border Kelebija road section

Category / Section	Parameter	Value	Unit
IB / – Bogojevo-Subotica-state border Kelebija	Length	104	km
	Number of lanes (total, in both directions)	2	lanes
	Maximum speed allowed	80	km/h
	Axle load for trucks allowed	10	t/axle

Table 44: Bogojevo to Subotica-state border Kelebija road section parameters

9.3.3 Road section Bačka Palanka-Romania-border Srpska Crnja

The port of Bačka Palanka is connected to Romania (border Srpska Crnja) with road No 12. And belongs to IB.

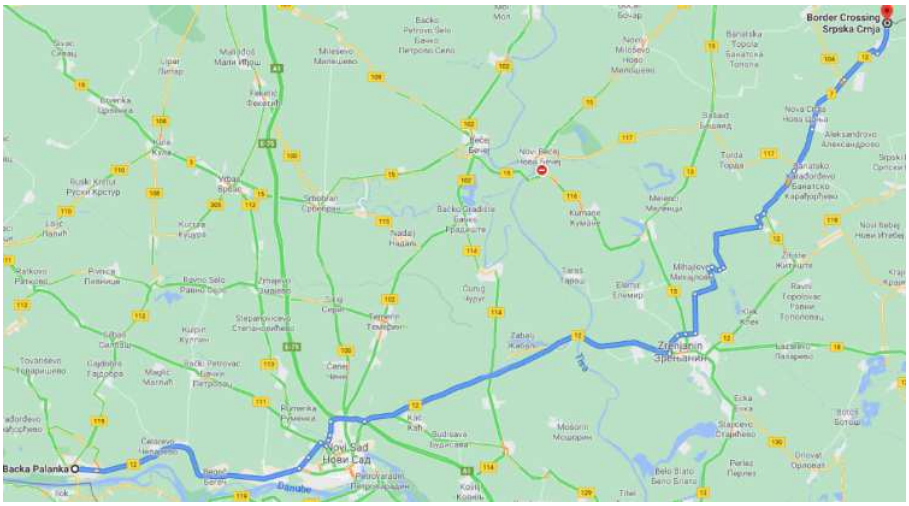

Figure 44. Bačka Palanka-Romania-border Srpska Crnja road section

Category / Section	Parameter	Value	Unit
IB / Bačka Palanka-Romania-border Srpska Crnja	Length	145	km
	Number of lanes (total, in both directions)	2	lanes
	Maximum speed allowed	80	km/h
	Axle load for trucks allowed	10	t/axle

Table 45: Bačka Palanka-Romania-border Srpska Crnja road section parameters

9.3.4 Road section Bačka Palanka-Croatia

Bačka Palanka-Croatia is connected with road No. 108. (Total length of road No. 108 is 74 km).

This road belongs to IIA State roads, class IIA, are marked with three-digit numbers, the first digit being 1 or 2. The total length of these roads is 7781 km.

Allowed axle load for trucks does not changed based on road category but based on the number of axles on truck. For trucks with one axle the allowed load is 10 t, for trucks with 2 axles the allowed load is 9 t, due to that the allowed axle load is the same on roads IIA and IB.

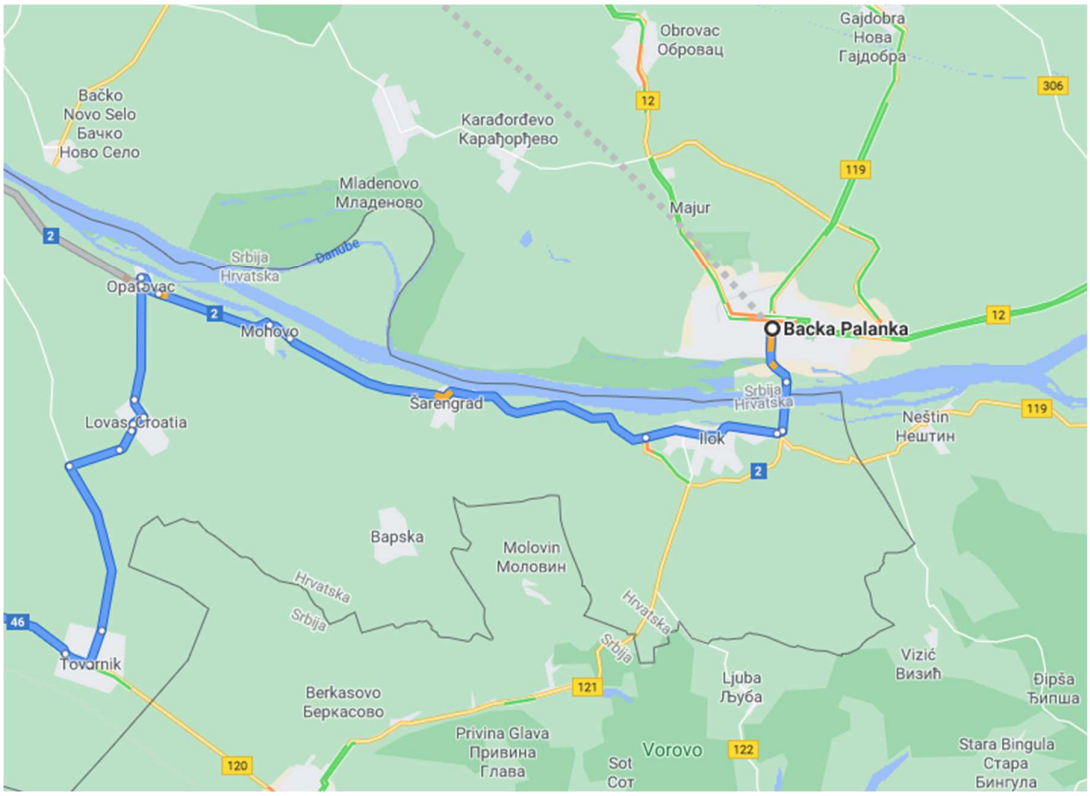

Figure 45 Bačka Palanka-Croatia road section

Category / Section	Parameter	Value	Unit
IB / Bačka Palanka-Romania-border Srpska Crnja	Length	3	km
	Number of lanes (total, in both directions)	2	lanes
	Maximum speed allowed	80	km/h
	Axle load for trucks allowed	10	t/axle

Table 46: Bačka Palanka-Croatia road section parameters

9.3.5 Road section Prahovo - Romania

Prahovo-Romania is connected with road No. 400 and it belongs to road IIB. Total length of this road is 25 km. Total length of IIB roads is 3160 km.

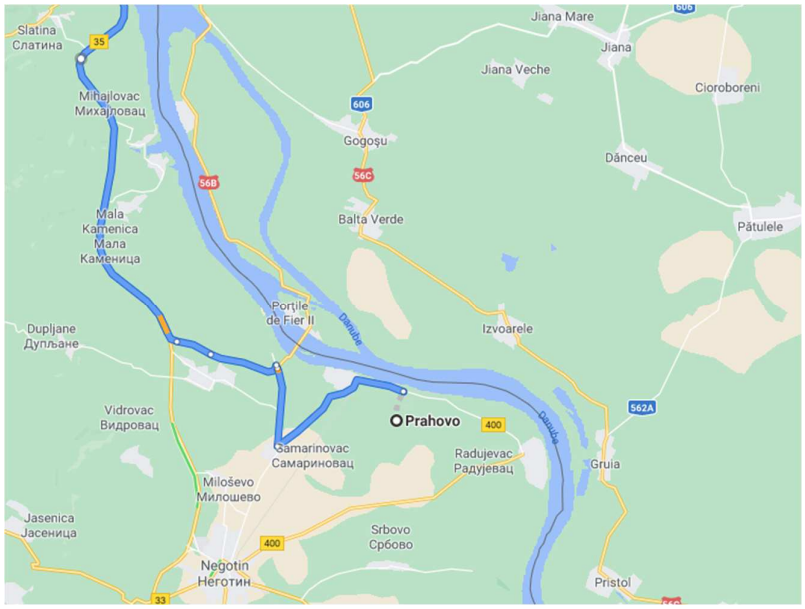

Figure 46: Prahovo-Romania road section

Category / Section	Parameter	Value	Unit
IIB / Prahovo-Romania	Length	5	km
	Number of lanes (total, in both directions)	2	lanes
	Maximum speed allowed	60	km/h
	Axle load for trucks allowed	10	t/axle

Table 47: Prahovo-Romania road section parameters

9.4 Multimodal terminals outside of ports

Multimodal terminals within ports are analyzed in deliverable D.T2.1.1: “Multimodal facilities and services”. Therefore, this section in this report will tackle multimodal terminals close to, but outside of ports, which can have an impact on the throughput of a nearby port or even its development plans.

There is officially 4 multimodal terminals in Serbia: ŽIT Beograd, NELT Dobanovci, LEGET Sremska Mitrovica and Luka "Dunav" Pančevo. Locations of the multimodal terminals are presented on the following figure.

Figure 47. Locations of the multimodal terminals in Serbia

Their locations are not in the vicinity of the analysed ports in this chapter, so they will not be analysed further.

10 Transport infrastructure status quo in Romania

10.1 Ports

10.1.1 Port of Drobeta Turnu Severin

10.1.1.1 Position

The geographic coordinates for indicating the position of Port of Drobeta Turnu Severin are Latitude: 44° 37' 24" N and Longitude: 22° 40' 04" E

Figure 48: Port of Drobeta Turnu-Severin[5]

- Maximum capacity of ships: 3000 tons
- Freight traffic in the port: 600000 to / year.

[5] http://www.danube-ports.ro/porturi.html

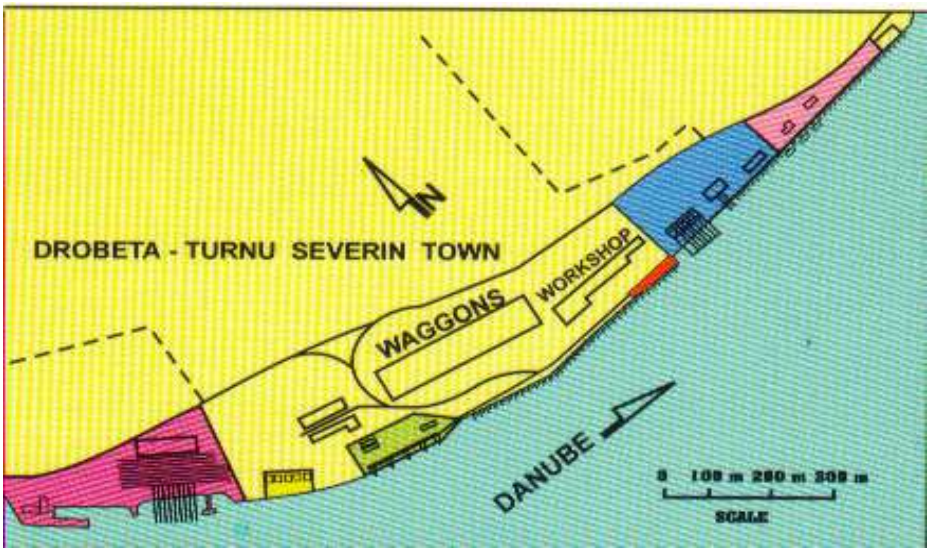

Figure 49: Port of Drobeta Turnu-Severin layout[6]

Overview of basic port's features are given in the below table.

Parameters	Explanation / Value
Port land owner (State, Region, Municipality, Private, Other)	State, Ministry of Transport and Infrastructure
Port authority name	National Company River Danube Ports Administration (APDF)
Number of operators (concessionaires, lessors)	3
Total port area (ha)	13.76 ha
Maximum draught (m) - natural or dredged	3
Total number of terminals	3
Heavy lift and out-of-gauge handling capacity (Yes/No)	No
Ability to handle full block train along the quay (Yes/No)	No
Ability to handle full block train in the port area	Yes

[6] www.apdf.ro

Parameters	Explanation / Value
(Yes/No)	
Transhipment equipment for intermodal transport (Yes/No)	No
Total quay length (vertical + sloped) (m)	1185
Vertical quay length (m)	365
Sloped quay length (m)	820
Undeveloped quay length (m)	Quays need improvements
Max number of vessels handled at the same time	4
Max capacity of anchorage or waiting area for barges (number)	10
Storage capacity (m2)	
Storage capacity for liquid cargos (m3)	
Storage capacity (TEU)	
Storage capacity (CEU - car equivalent unit, for Ro-Ro terminals)	
Bunkering facilities within the port area (Yes/No)	yes
Shore-side power supply for vessels (Yes/No)	
Road connection (Yes/No)	yes
Rail connection (Yes/No)	yes
Number of quay cranes of lifting capacity Q < 10 tons	1
Number of quay cranes of lifting capacity 10 < Q < 16 tons	2
Number of quay cranes of lifting capacity 16 < Q < 50 tons	0
Number of quay cranes of lifting capacity Q > 50 tons	0
Total number of quay cranes	3

Table 48: Basic features of the Port of Drobeta Turnu Severin

10.1.1.2 Ownership, administration (governance) and operation

Port infrastructure is state public property being granted to National Company Danube River Ports Administration J.S.Co. Giurgiu (Romanian acronym: APDF), through concession contract signed between the Ministry of Transport and APDF in 2008. The Ministry of transport is the owner of 80% of shares of APDF company, the rest of 20% being owned by Fondul Proprietatea.

APDF is responsible for the implementation of port policies and of port infrastructure development programs issued by the Ministry of Transport. APDF have mainly the following duties and obligations:

a) to ensure the repair, maintenance and up keeping of the minimum technical characteristics of the infrastructure;

b) to provide the users the waterborne transport infrastructure on a non-discriminatory basis, in accordance with the regulations in force;

c) to monitor or ensure the permanent provision of security services;

d) to keep a record of port workers carrying out ship loading / unloading, storage, stowage, packing, goods palletizing, ship cleaning and similar activities;

e) to ensure coastal and floating signalling, as well as minimum depths in port;

For the safety of navigation the responsibility belongs to the Harbourmaster (Romanian Naval Authority) which operates the RoRIS system.

The port operations are performed by port operators which are entirely private companies. The port operators have renting contracts signed with APDF. The main operators are: TTS, Cargill, Beo Trade Com.

10.1.1.3 Hinterland connections

Port of Drobeta Turnu Severin is connected through two roads with single line per way each to the city. Then, the port is connected to the following national roads (DN) and European roads (E) :

- DN 6 /E 94 Bucharest - Dr.Tr.Severin (339 Km) - Timisoara (219 Km)

- DN56, DN56A Dr.Tr.Severin - Calafat (103 Km)

- DN 67 (Dr.Tr.Severin - Târgu Jiu (85 Km) and the European road E70.

The roads connecting the port with the city need improvements.

Port of Drobeta Turnu Severin has rail connections with the town station. The town station is situated on the railway Line 900 - Bucharest–Craiova–Drobeta-Turnu Severin–Caransebeș–Lugoj–Timișoara–Stamora Moravița. The distance Bucharest - Dr.Tr.Severin is 323 Km and Dr.Tr.Severin – Timișoara 210 km, the latter being a catchment area of the Drobeta Turnu- Severin hinterland.

Drobeta Turnu-Severin is located on the Corridor Orient-East Med, as was defined by EU guidelines for the development of the trans-European transport network.

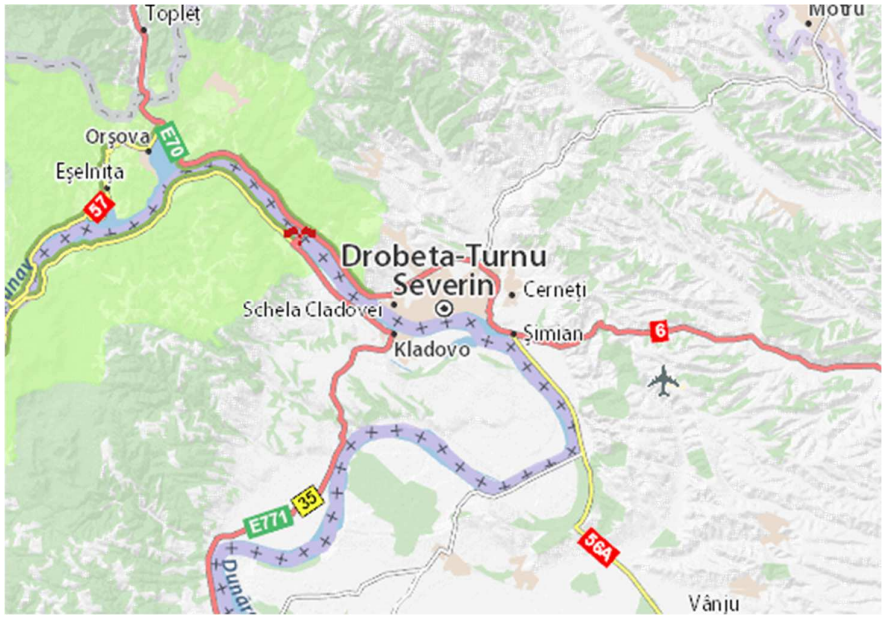

Figure 50: Location of Drobeta Turnu-Severin

10.1.1.4 Port infrastructure

Total surface of the port including 3 areas has in total 13,76 hectares (commercial 7,26 hectares, passengers 4,40 hectares and project cargo ramp 2,10 hectares). Annual cargo throughput capacity of the commercial basin is 725.000 tons/year.

The port is operating break bulk cargo, ore, fertilizers, cereals, coal, oil products, etc. There are 3 operators TTS, Carghill (cereals) and Beo Trade Com (oil products).

Port allows mooring of barges up to 3000 tons and with a draught of 2,5 m.

The length of vertical quays used for cargo operation is 365 m (65 m in the cereals operation area). The cereals operator has a 35 m sloped quays in addition. Another of 400 m of sloped quays is used for waiting area and 365 m of sloped quays for winter mooring.

There are available 3 cranes (2 with 16 tons capacity and 1 of 15 tons).

10.1.1.5 Port's storage facilities

The port of Drobeta Turnu Severin has open storage platforms and covered storage (1000 sqm).

10.1.2 Port of Giurgiu

10.1.2.1 Position

Port of Giurgiu is located on the Danube left side km 489-497. Giurgiu is included in the TEN-T central network. It is located at the intersection of the Danube River and Corridor IX, which is on the north-south route between the Baltic countries and Bulgaria, Greece and Turkey.

The geographic coordinates for indicating the position of Port of Giurgiu are Latitude: 43°53'28"N and Longitude: 25°57'26"E

Figure 51: Port of Giurgiu[7]

Over the years, the Giurgiu – Ruse (Bulgaria) bridge has been a basic link for rail and road transport services. This crossing point has been registered significant traffic of goods and foreign trucks, representing one of the first 4 Romanian border crossing points for rail freight transport. Giurgiu is also one of the Danube ports close to Bucharest, which gives it geographical significance.

[7] Source: http://www.danube-ports.ro/giurgiu.html

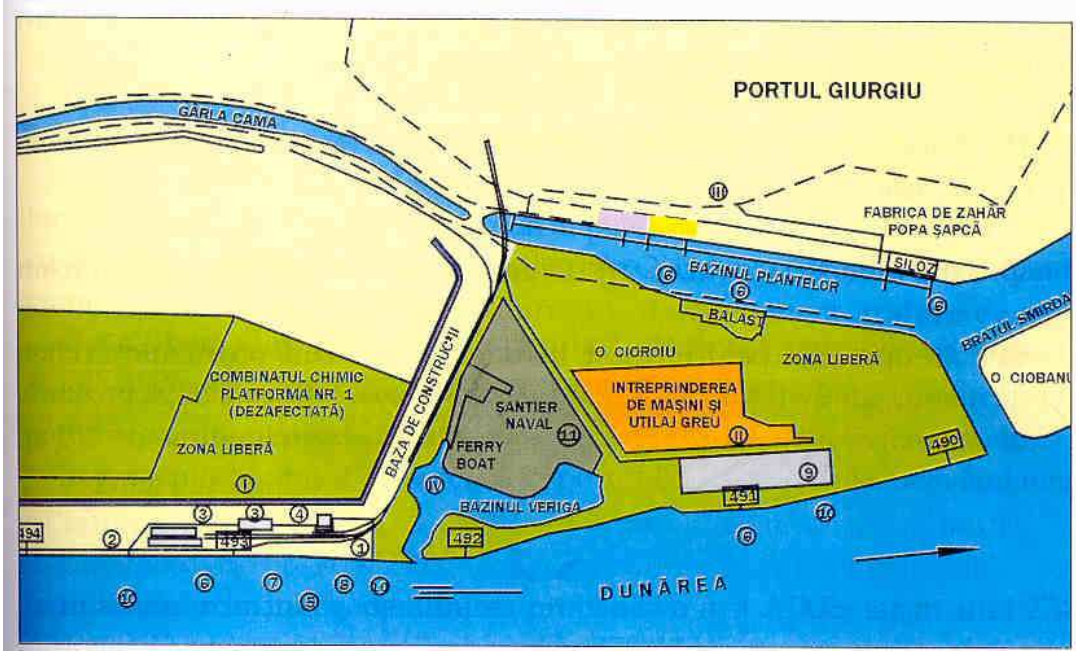

Figure 52: Port of Giurgiu layout[8]

Overview of basic port's features are given in the below table.

Parameters	Explanation / Value
Port land owner (State, Region, Municipality, Private, Other)	State, Ministry of Transport and Infrastructure Municipality of Giurgiu
Port authority name	National Company River Danube Ports Administration (APDF) Giurgiu Free Zone
Number of operators (concessionaires, lessors)	20
Total port area (ha)	59 ha
Maximum draught (m) - natural or dredged	2.5 m
Total number of terminals	20
Heavy lift and out-of-gauge handling capacity (Yes/No)	No

[8] http://www.danube-ports.ro/harta_giurgiu.html

Parameters	Explanation / Value
Ability to handle full block train along the quay (Yes/No)	No
Ability to handle full block train in the port area (Yes/No)	No
Transhipment equipment for intermodal transport (Yes/No)	No
Total quay length (vertical + sloped) (m)	4750
Vertical quay length (m)	500
Sloped quay length (m)	3400
Undeveloped quay length (m)	850
Max number of vessels handled at the same time	5
Max capacity of anchorage or waiting area for barges (number)	10
Storage capacity (m2)	
Storage capacity for liquid cargos (m3)	
Storage capacity (TEU)	
Storage capacity (CEU - car equivalent unit, for Ro-Ro terminals)	
Bunkering facilities within the port area (Yes/No)	yes
Shore-side power supply for vessels (Yes/No)	no
Road conneection (Yes/No)	yes
Rail connection (Yes/No)	Yes – needs improvement
Number of quay cranes of lifting capacity Q < 10 tons	2
Number of quay cranes of lifting capacity 10 < Q < 16 tons	2
Number of quay cranes of lifting capacity 16 < Q < 50 tons	2
Number of quay cranes of lifting capacity Q > 50 tons	0

Parameters	Explanation / Value
Total number of quay cranes	6

Table 49: Basic features of the Port of Giurgiu

10.1.2.2 Ownership, administration (governance) and operation

Port infrastructure is public property being granted to N.C. Administration of Danube River Ports J.S.Co. Giurgiu, through concession contract signed in 2008. Ministry of Transport is the owner of 80% shares of the Company, the balance of 20% being owned by Fondul Proprietatea.

Another part of the port is administrated by Free Zone Administration, which was established in 1996 in order to develop international trade and to increase the use of regional resources. Between 1996 - 2004 the Free Zone Administration was under Ministry of Transport and from 2004 become a joint stock company owned by the Giurgiu County Council. Starting 2008 the company is fully owned by Local Council Giurgiu.

In the Port of Giurgiu there are five locations / areas that offer port facilities:

- Ramadan: passenger berths and berths for operating cereals, ballast, coal and general cargo
- Plants Canal: cereals, general cargo
- Veriga Basin: shipyard.
- Cioroiu port: oil terminal.
- Giurgiu Free Zone: operates general cargo and containers (not in last period) .

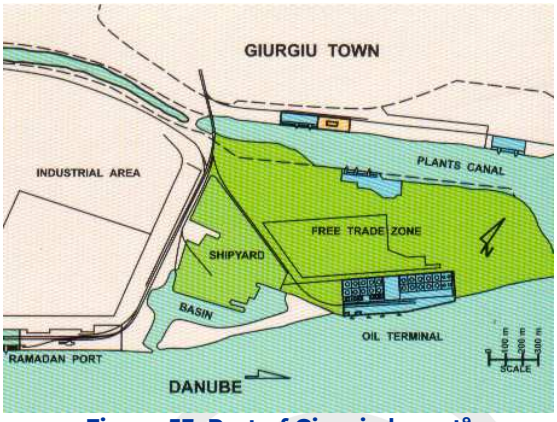

Figure 53: Port of Giurgiu layout[9]

[9] http://apdf.ro/sitevechi/giurgiu.html

APDF is responsible for the implementation of port policies and of port infrastructure development programs issued by the Ministry of Transport. APDF have mainly the following duties and obligations:

- to ensure the repair, maintenance and up keeping of the minimum technical characteristics of the infrastructure;
- to provide the users the waterborne transport infrastructure on a non-discriminatory basis, in accordance with the regulations in force;
- to monitor or ensure the permanent provision of security services;
- to keep a record of port workers carrying out ship loading / unloading, storage, stowage, packing, goods palletizing, ship cleaning and similar activities;
- to ensure coastal and floating signalling, as well as minimum depths in port;

The responsibility for the safety of navigation belongs to the Harbourmaster (Romanian Naval Authority) which operates the RoRIS system.

The port operations are performed by port operators which are entirely private companies. The port operators have renting contracts signed with APDF.

10.1.2.3 Hinterland connections

The port of Giurgiu is located 64 km from Bucharest, at the intersection of some important road and rail networks (former pan-European Corridor IX Greece – Bulgaria – Russe - Giurgiu – Bucureşti – Ploieşti –Bacău Iaşi – Sculeni with exit to Moldova and Russia and close to former pan-European Corridor IV (Hungary - Nădlac – Arad – Timişoara –Deva – Sibiu – Piteşti – Bucureşti – Constanţa).

The connection to national / European network is made by European road E70 that stretches from west to east: Coruña, Gijón, Bilbao, San Sebastián, Bordeaux, Saint-Etienne, Lyon, Turin, Verona, Venice, Trieste, Ljubljana, Zagreb, Belgrade, Timișoara, Craiova, Bucharest, Giurgiu, Rousse, Varna, Samsun, Trabzon, Batumi, Poti. The connected roads in the area are DJ 504, DJ 507, DN 5, DN 5B, DN 5C.

Figure 54: European route E-70[10]

The roads are in a good status.

[10] https://en.wikipedia.org/wiki/European_route_E70

The railway network in Giurgiu (railway line 902) includes two stations: Giurgiu City Railway Station (the main passenger station on Bucharest-Videle route) and Giurgiu Nord (transport passengers and goods and control of crossing the border with Bulgaria) connected to the Port of Giurgiu. The railway line Bucharest – Giurgiu (67 km) is the first railway line build in Romania, in order to connect the capital city Bucharest with the port of Giurgiu. It was opened in October 1869. Currently the railway line is not electrified and it is not in use since 2005 when a bridge over the Arges river collapsed (Grădistea bridge). In November 2000 it was signed a contract for the modernization of the railway line Bucharest North -Jilava - Giurgiu North – RO-BG Border. Since 2005 passenger trains were redirected via Videle station – Giurgiu – RO-BG border, but the cargo coming / exiting the port did not use the railways.

10.1.2.4 Port infrastructure

The infrastructure in the port of Giurgiu is located on the Danube River directly, but also in basins and canals available. That's why the berths has such a long length, around 4.7 km.

Ramadan sector includes 1100 m with sloped quay with direct access from the waterway and has depths of 3.3 m. The infrastructure comprise:
- 450 m quay – used for bulk and general cargo;
- 250 m (2 berths) – general cargo;
- 400 m (4 berths) – for passengers;

The is a storage platform of 8,000 sqm and a warehouse of 3,000 sqm.

Veriga basin is approx. 1000 m length of and widths between 120 ÷ 150 m. The access in the basin has a width of 40 ÷ 50 m and the depths 2.5 m. The width of the access in the basin will be extended to 60 m in the following 2 years. In the Veriga basin there is a shipyard with a synchrolift for 5000 t vessels. Now the basin is a part of Giurgiu Free Zone.

Plant Canal includes 1190 m vertical and sloped quay where bulk and general cargo is operated. The port facilities of the Plant Canal (km490-492) has access to km 490 Danube River through the Smarda branch. The distance between the basin and the Danube is 500 m. The port is a natural basin with mooring fronts with a traffic including bulk cargo for construction, as well as cereals. The port allows the mooring of barges up to max. 1500 t, having 12 berths as follows:

- a quay of about 400m made of natural stone blocks;
- 2 berths (~ 170 m long) with vertical quays, for aggregates (gravel and quarry products). The key is provided with crane and railway track;
- 170 m (2 berths) for silos;
- 850 m (8 berths) undeveloped quay fronts, which are used for waiting in winter time;
- 170 m from a reinforced concrete structure;
- on the opposite side there is a mooring front with a length of 160 m - ballast docks.

Storage platform has 29,000 sqm.

Cioroiu oil terminal area allows mooring of barges up to max. 2000 t. The access is provided directly from the Danube River. The mooring depth is 3,50 m. There is a sloped quay of 680 m.

Giurgiu Free Zone Port comprises **for the operation of containers** a vertical quay of 217 m length, could moor/berth simultaneously 3 barges of 70 m length each. The equipment comprises:
- 1 quay gantry crane of 50/25 t x 25/35 m
- 2 quay gantry cranes of 15/8 t x 23/36 m, the secondary in function from 01.09.2006
- 1 reach stacker of 45 t that could handle 40 ft containers up to 12 m height
- 6 motor trucks/piler with the maximum lifting capacity up to 3 t each
- 2 platforms for internal transportation of 60 t each

10.1.3 Port of Galați

10.1.3.1 Position

The port of Galati is located on the left bank of the Danube River between km 157+600 and Mm 78+1300. The city of Galați is one of the biggest economic centers in Romania and the economic environment has developed around the shipyard, the steel plant complex (since 2019 belonging to the British company Liberty House Group) and the port.

The port of Galati is located close to the border with Moldova and Ukraine. The road distance between Galați the RO – MD/ UA border is 18 km.

The port of Galați is situated on the so called *Maritime Danube* because the access of maritime ships up to 25,000 tdw is allowed by the natural depths.

The geographic coordinates for indicating the position of Port of Galați are Latitude: 45° 25' N and Longitude: 28° 05' E

Figure 55: Port of Galati[11]

[11] https://apdmgalati.ro

Overview of basic port's features are given in the below table.

Parameters	Explanation / Value
Port land owner (State, Region, Municipality, Private, Other)	State, Ministry of Transport and Infrastructure
Port authority name	National Company Maritime Danube Ports Administration (APDM)
Number of operators (concessionaires, lessors)	10
Total port area (ha)	86
Maximum draught (m) - natural or dredged	7
Total number of terminals	4
Heavy lift and out-of-gauge handling capacity (Yes/No)	yes
Ability to handle full block train along the quay (Yes/No)	yes
Ability to handle full block train in the port area (Yes/No)	yes
Transhipment equipment for intermodal transport (Yes/No)	yes
Total quay length (vertical + sloped) (m)	7177
Vertical quay length (m)	4675
Sloped quay length (m)	2390
Undeveloped quay length (m)	
Max number of vessels handled at the same time	
Max capacity of anchorage or waiting area for barges (number)	15
Storage capacity (m2)	
Storage capacity for liquid cargos (m3)	49000
Storage capacity (TEU)	700
Storage capacity (CEU - car equivalent unit, for Ro-Ro terminals)	

Parameters	Explanation / Value
Bunkering facilities within the port area (Yes/No)	yes
Shore-side power supply for vessels (Yes/No)	yes
Road conneection (Yes/No)	yes
Rail connection (Yes/No)	yes
Number of quay cranes of lifting capacity Q < 10 tons	10
Number of quay cranes of lifting capacity 10 < Q < 16 tons	5
Number of quay cranes of lifting capacity 16 < Q < 50 tons	20
Number of quay cranes of lifting capacity Q > 50 tons	4
Total number of quay cranes	39

Table 50: Basic features of the Port of Galati

10.1.3.2 Ownership, administration (governance) and operation

Port infrastructure is state public property being granted to the National Company Maritime Danube Ports Administration LSCo. Galati (Romanian acronym APDM), through concession contract signed in 2008. Ministry of Transport is the owner of 93% shares of the Company, the balance of 7% being owned by Fondul Proprietatea. APDM fulfils the function of Port Authority and the quality of Port Administrator in the sea – river ports located on the Romanian river-sea stretch of the Danube.

APDM is responsible for the implementation of port policies and of port infrastructure development programs issued by the Ministry of Transport. APDM have mainly the following duties and obligations:

a) to ensure the repair, maintenance and up keeping of the minimum technical characteristics of the infrastructure;

b) to provide the users the waterborne transport infrastructure on a non-discriminatory basis, in accordance with the regulations in force;

c) to monitor or ensure the permanent provision of security services;

d) to keep a record of port workers carrying out ship loading / unloading, storage, stowage, packing, goods palletizing, ship cleaning and similar activities;

e) to ensure coastal and floating signalling, as well as minimum depths in port;

For the safety of navigation the responsibility belongs to the Harbourmaster (Romanian Naval Authority) which operates the RoRIS system.

The port operations are performed by port operators which are entirely private companies. The port operators have renting contracts signed with APDM.

10.1.3.3 Hinterland connections

Galati, located on the left bank of the Danube, 80 Km away from the Danube Delta, has 4 sectors, one for passenger transport and three for cargo transport. Galati is Romania's second important port, having direct connection with the Black Sea through the Danube and Sulina Canal.

The port of Galați is connected to the European road E87, a North–South road on the coast of Black Sea, running from Odessa (Ukraine), Galați, Tulcea (Romania), Constanța (Romania), Varna (Bulgaria), Burgas (Bulgaria),via Çanakkale to Antalya (Turkey). Galați is situated on the national roads DN 25 and DN 26, connecting the port / city with the Northern part of Romania (Moldova region). DN 22B makes the connection with the city and port of Brăila and further the connections with the West side of Romania and other regions. The roads connecting Galați has only one single lane per direction and needs improvements.

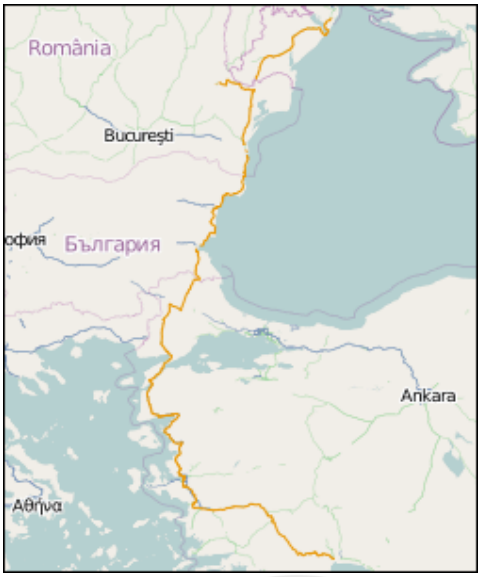

Figure 56: Road E87[12]

The Port of Galați is situated on the railway line 700, alignment: Bucharest North – Urziceni – Făurei – Brăila – Galați (269 km). The railway line needs lot of improvements.
The port of Galați is the only port in Europe were is available European and large gauge (specific for former soviet countries). The length of the rail connection within the port is 12,348 m (European gauge)

[12] Antalya (Turkey) – Burgas (Bulgaria) – Constanta, Tulcea, Galati, Brăila (Romania) – Odessa (Ukraine)

Figure 57: Railway line 700 Bucharest North - Galati

By water Galați is situated on the Danube River (Rhine – Danube Corridor) and has direct connections with the Black Sea and maritime transport as well as with the West side of Europe by barges/ convoys. Port of Galați Port of Galati has 4 anchorage areas, near the right bank of the Danube river, as follows:
- Mm 76,0 ÷ Mm 78,5 - sea-going & river vessels
- Mm 80,0 ÷ Km 150,0 - non-propelled vessels, without crew on board
- Km 155,0 ÷ Km 158,0 - sea-going & river vessels, including barges
- Km 158,2 ÷ Km 159,3 - empty river vessels

10.1.3.4 Port infrastructure

Port infrastructure is developed and the Port of Galați can handle all types of cargo and provide all kinds of services needed in the port area: cargo storing facilities (open and covered storing areas), port equipment for vessel operation, cereal silos, waste collection from the ships: garbage, used and bilge water, bunkering facilities, ship maintenance facilities, Free Zone, custom office, shipyard, cereal terminal, container terminal, oil terminal, parking places for trucks, security standards according to the ISPS code, assistance services for the transshipment of oil products in the specialized berth, winter area.
The port has 56 berths

Port of Galati consist of 4 terminals / sectors / locations, as follows:
1. Mineral Terminal: Km 155,40 ÷ Km 157,60
2. Commercial Terminal: Km 149,35 ÷ Km 151,00
3. Docks Terminal: Mm 80,00 ÷ Km 149,35
4. New Basin Terminal: Mm 78+1300 ÷ Mm 79+700

1. **Mineral Terminal** is specialized in loading and discharge of bulk cargos and also steel rolled products. Its building started in the end of 60's and the terminal started to be used in the early 70's.

Figure 58: Port of Galati - Mineral terminal[13]

The locations has 16 operational berths situated along the Danube River. The depths to the berths vary between 3.5 m and 6.5m. The area has port platforms of 16,380 sqm and storage areas of 41,565 sqm. Port equipment are between 16 – 25 tf and belt conveyors for minerals.

Railways ensure the transfer from the European standard gauge to the broad gauge used in the former URSS countries,

[13] https://apdmgalati.ro/portul-galati/portul-mineralier

2. **Commercial Terminal** – Located on the left bank of the Danube, between km.151 – Nm 80,5.

Figure 59: Galati Commercial terminal and Port Authority building[14]

The sector is not used for operations with cargoes. The sector is situated in the heart of the city and it is used for restaurants, historical vessels, technical vessels.

3. Docks Terminal – Located between Nm. 80 and Nm. 80,5 on the left bank of the river. General cargo is operated in the port. The maximum capacity of ships that have access into the port: river and sea-going vessels of up to 4500 tdw.

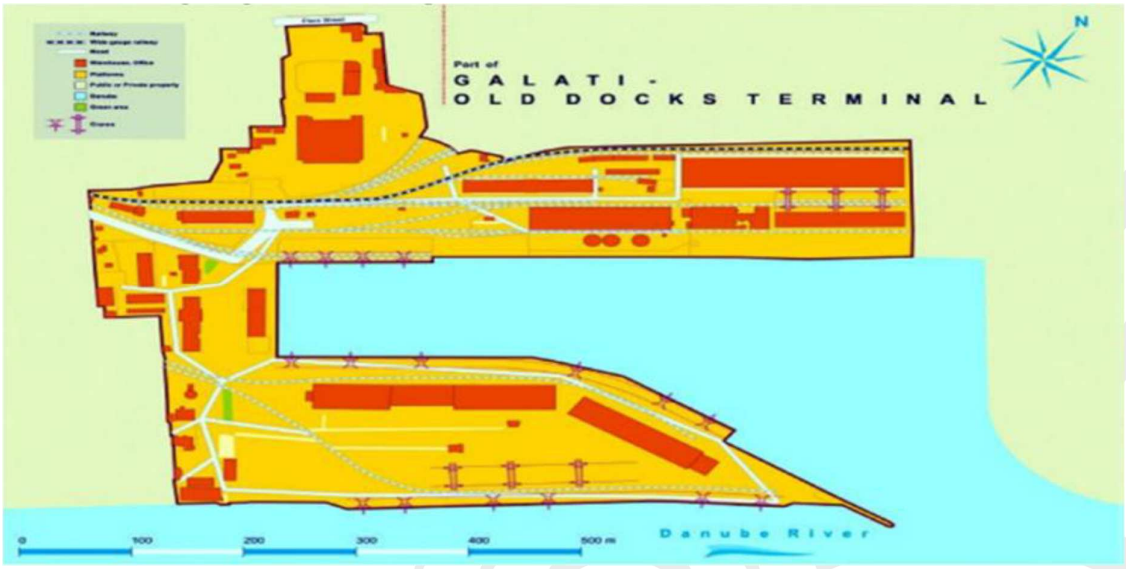

Figure 60: Galati Docks terminal [15]

[14] https://apdmgalati.ro

[15] Ibid.

The Docks Area has berths with a length of 1,616 m, out of which 500 m are on the Danube. The terminal handle metal products, bulk cargoes, general cargoes and containers. It gas 131,105 sqm open storage platforms and covered storage areas of 46,303 sqm. The equipment comprises floating cranes (16, 32 tf), rail cranes (5t, 8t, 10t, 25 t – transcontainer), and auto cranes (25t, 50 t, 63 t).
The quays are old (some of them constructed before 1900) and needs improvements. Recently it was rehabilitated the berth no. 31 and currently is under rehabilitation the berth no. 32, both of them being used mainly for cereals. All berths have rail infrastructure. The railway line has a length of 2,619 m, out of which 1,313 m rail for the reception/delivery of cargo, 1,206 m for loading / discharging along the berths and 100 m for wagons with large gauge**.**

4. New Basin Terminal – Located between NM. 79,4 and NM. 78+1300 (the area downstream from Damen Shipyard Galati).

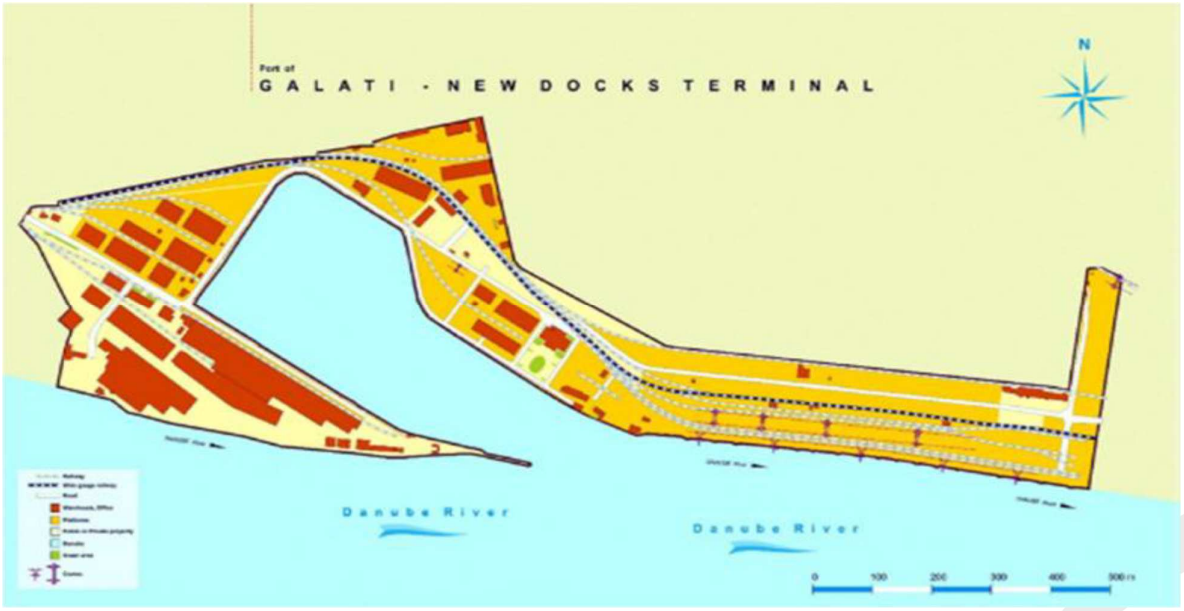

Figure 61: Port of Galati – New basin terminal[16]

The area has open storage platforms of 131,105 sqm and covered storage areas of 46,303 sqm.The port handle metal products, bulk cargoes, general cargoes, industrial equipment, wood, scrap. Port equipment comprises: floating cranes (10, 16, 32 t), rail cranes (3, 6, 10, 32 t), auto cranes (30, 50 t).
The railway line has a length of 6,474 m, out of which 1,717 m rail for the reception/delivery of cargo, 4,257 m for loading / discharging along the berths and 500 m for wagons with large gauge.
In the area is under construction the new intermodal terminal using EU financing (CEF, CF - Operational Sectorial Program for Transport, private funds).

[16] https://apdmgalati.ro

10.1.3.5 Port's storage facilities

Silo for 25,000 t in Docks area. The cells have different capacities - 50 tons, 60 tons, 90 tons and 100 tons and allow the storage of several types of agricultural products at the same time.

Silo for 10,000 to in Docks area.

Capacities of tanks[17] in the New Basin:

- Storing tanks for light oil products with a total volume 11200 cm
- Heavy oil products tanks with a capacity of 33000 cm
- Tanks of processing fuels for ships, capacity of 1500 cm
- Chemical products tanks with a capacity of 3300 mc.

Covered storage facilities:

- Docks sector : 46,303 sqm
- New Basin: 46,303 sqm

[17] https://unicom-group.ro/oilterminal/activitate.htm

10.1.4 Port of Constanta

10.1.4.1 Position

Please briefly explain the location and position of your port.

The Port of Constanta is located on the Western coast of the Black Sea, at 179 nautical miles from the Bosporus Strait. The geographic coordinates for indicating the position of Port of Constanta are Latitude: 44° 7' 51" N and Longitude: 28° 39' 43" E (Gara Maritima Constanta).

The connection of the port with the Danube river is made through the Danube-Black Sea Canal, ending the Rhine-Danube Corridor, which provides the main east-west link across Continental Europe. Its route along the Danube River connects Strasbourg and Southern Germany with the Central European cities of Vienna, Bratislava and Budapest, before passing through Serbian, Bulgarian and Romanian ports.

Figure 62: Port of Constanta and its IWW link to European hinterland[18]

Overview of basic port's features are given in the below table.

Parameters	Explanation / Value
Port land owner (State, Region, Municipality, Private, Other)	State, Ministry of Transport and Infrastructure
Port authority name	National Company Maritime Ports Administration JS Co. Constanța
Number of operators (concessionaires, lessors)	
Total port area (ha)	3926 ha (1313 land and 2613 ha water area)
Maximum draught (m) - natural or dredged	19

[18] www.portofconstantza.com

Parameters	Explanation / Value
Total number of terminals	21
Heavy lift and out-of-gauge handling capacity (Yes/No)	yes
Ability to handle full block train along the quay (Yes/No)	yes
Ability to handle full block train in the port area (Yes/No)	yes
Transhipment equipment for intermodal transport (Yes/No)	yes
Total quay length (vertical + sloped) (m)	29830
Vertical quay length (m)	29830
Sloped quay length (m)	0
Undeveloped quay length (m)	3262
Max number of vessels handled at the same time	
Max capacity of anchorage or waiting area for barges (number)	150
Storage capacity (m2)	3,898,325
Storage capacity for liquid cargos (m3)	1,700,000
Storage capacity (TEU)	16,000
Storage capacity (CEU - car equivalent unit, for Ro-Ro terminals)	6,600
Bunkering facilities within the port area (Yes/No)	yes
Shore-side power supply for vessels (Yes/No)	yes
Road conneection (Yes/No)	Yes
Rail connection (Yes/No)	Yes
Number of quay cranes of lifting capacity Q < 10 tons	yes
Number of quay cranes of lifting capacity 10 < Q < 16 tons	yes

Parameters	Explanation / Value
Number of quay cranes of lifting capacity 16 < Q < 50 tons	yes
Number of quay cranes of lifting capacity Q > 50 tons	yes
Total number of quay cranes	

Table 51: Basic features of the Port of Constanta

10.1.4.2 Ownership, administration (governance) and operation

Port infrastructure is state public property being granted to the National Company Maritime Ports Administration JSCo. Constanța (Romanian acronym APMC), through concession contract signed in 2008. Ministry of Transport is the owner of 80% shares of the Company, the balance of 20% being owned by Fondul Proprietatea. APMC fulfils the function of Port Authority and the quality of Port Administrator for the ports Constanta (including Midia) and Mangalia.

APMC is responsible for the implementation of port policies and of port infrastructure development programs issued by the Ministry of Transport. APMC have mainly the following duties and obligations:

a) to ensure the repair, maintenance and up keeping of the minimum technical characteristics of the infrastructure;

b) to provide the users the waterborne transport infrastructure on a non-discriminatory basis, in accordance with the regulations in force;

c) to monitor or ensure the permanent provision of security services;

d) to keep a record of port workers carrying out ship loading / unloading, storage, stowage, packing, goods palletizing, ship cleaning and similar activities;

e) to ensure coastal and floating signalling, as well as minimum depths in port;

For the safety of navigation, the responsibility belongs to the Harbourmaster (Romanian Naval Authority).

The port operations are performed by port operators which are entirely private companies (land – lord port model). The port operators have renting contracts signed with APMC.

10.1.4.3 Hinterland connections

The Port of Constanta is located at the crossroads of the trade routes linking the markets of the landlocked European countries to Transcaucasus, Central Asia and the Far East. The port has connections with the Central and Eastern European countries through the Rhine – Danube Corridor.

The Port of Constanta is linked with the hinterland by the Danube – Black Sea Canal. The entrance to the canal is on the South part of the port and connects the Black Sea with the European inland waterway network. The canal offers an alternative route from the Black Sea ports to the Danube ports of Central Europe that is shorter by approximately 400 km. The Danube – Black Sea Canal as a length of 64.4 km .

The Port of Constanta is very well linked at the road and rail transport networks.

The port of Constanta has a significant road transport infrastructure in place, the total length of road infrastructure within the port area amounts to 100 km. The quality of the port road infrastructure is in generally in a good condition. Constanța port has ten road entrances. The port is directly connected to A2 highway, toward Bucharest (225 km) and other European or national roads:

- E 87 Antalya (Turkey) – Burgas (Bulgaria) – Constanta, Tulcea, Galati, Brăila (Romania) – Odessa (Ukraine)
- E 81 (E 81 begins in Constanța, Romania and ends in Mukachevo, Ukraine, is 956 km (594 mi) long.),
- E 60 (the second longest road in the International E-road network. It runs 8,200 km (5,100 mi), from Brest, France (on the Atlantic coast), to Irkeshtam, Kyrgyzstan (on the border with China),
- DN 39 (Constanța – Mangalia – Bulgarian border- Varna),
- DN 2A Bucharest - Urziceni – Slobozia – țăndărei – Hârșova – Constanța (part of E60)
- DN 3 Bucharest – Fundulea – Lehliu Gară – Călărași – Ostrov – Basarabi – Constanța

Figure 63: European road route E 81 Constanta Mukachevo

Figure 64: European road route to China

The port offers direct access from every terminal to the national and European railway network, through its own 300 km long railway system. The port is situated on the national railway line 800 (Bucharest North – Constanta – Mangalia). The total length is 268 km and the rail distance between Constanta and Bucharest is 220 km. the railway line has recently been improved and has a very good quality (120 km/h for cargo).

Constanta has also connections with the hinterland by pipelines. The petroleum terminal has 7 operational jetties. Jetties allow berthage of vessels up to 165,000 dwt. capacity. Connection between storage farms and jetties is done by a 15 km underground and overground pipelines network. Pipelines total length is 50 km. The Port of Constantza is connected to the national pipeline, therefore with the main Romanian refineries.

M. Kogalniceanu Airport is the nearest airport to Constantza, located at 20 km distance from the Port of Constantza. It is an international airport and represents an air-gateway with high impact over regional development.

10.1.4.4 Port infrastructure

The Port of Constanta covers 3.926 ha of which 1,313 ha is land area and the rest of 2.613 ha is water area. The total land area of 1.313 ha is shared between the North Port that occupies a land area of about 495 ha and the South Port with about 818 ha. Another 561 ha are included, according to the masterplan, in development project for short, medium and long term perspective.

The Port of Constanta is not an open shore port. Its infrastructure is basin type with three basins (including Midia).

basins. The main tuning basin for the North Port of Constanta is located in front of the oil terminal having enough area to enable the manoeuvring of the common vessels calling the North Port.

The Constanta Port has the maximum draught, natural or dredged, of 19 m and a minimum water depth of 7 m.

The Port of Constanta area is utilized through a total number of 22 terminals for commercial cargo handling operations.

The total length of the quays is 32 km, and the water depth is up to 19 m.

The port has facilities for mooring/anchorage for dangerous cargo vessels.

According to the European Conference of Ministers of Transport classification, the size of the vessel/convoy transiting the waterway connection Danube – Black Sea canal is inland waterway class VIc.

The port has ten terminals for bulk cargoes. The dry bulk cargoes (iron and non-ferrous ore, grain, coal, coke, cement, construction materials, phosphate etc.), are operated in specialized terminals located next to the river-maritime basin. There are specialized terminals that operate iron ore, bauxite, coal and coke have 13 berths. There is specialized terminal where fertilizers, phosphate, urea, apatite and other chemical products are operated.

The Port of Constanta is a traditional partner for the Eastern and Central European countries with high agricultural production that transit their cargoes towards worldwide destinations. There are many facilities for the operation and storage of dry cereals, which are served by several specialized berths.

The Port of Constanta is very well connected with the national and European road network through ten road entrances allowing systemization and organization of traffic through 25 road lanes. The total length of roads in the port amounts to 100 km. The A2 motorway is linking Bucharest to city port Constanta and a length of 203 km.

The railway infrastructure facilitates handling full block train in the port area as well as along the quay. Therefore, through the round-the-clock train services and every day shuttle trains high volumes of cargo are transported to/from the most important economic areas of Romania and Eastern Europe.

The railway infrastructure comprises of six rail gates and nine rail tracks providing the connection between Europe, Caucasus and Central Asia. The total length of rail tracks along the quay walls is 19,873.63 m and the total length of rail tracks within the port area amounts to 300 km.

The port of ensure a sufficient and continuous provision of power through its shore-side power supply facilities for vessels.

Waste management in the Port of Constanta represents an important component that comply with the national and international legislation on environment protection by creating an efficient working framework for collecting, treating, stocking and storing of port and marine wastes. There are four components: the incinerator, the ecological site, the collecting-ship, the wastewater treatment plant & leachate treatment station.

To support the environmental pollution control of vessels the port offers facilities for the collection and reception of the used oil.

10.1.4.5 Port's storage facilities

The beneficiaries of the Port of Constanta can be divided into three major groups.

- The *first group* of direct beneficiaries is represented by terminal operators who use the port infrastructure and receive direct benefit from new cargo being handled.
- The *second group* of port users are the ship operators.
- The *third group*, the related companies providing different connected services for cargo and ships.

There are also indirect beneficiaries represented by economic operators involved in international trade.

In December 2020, according to the company's data, there were 921 companies involved in providing services in Port of Constanta, Midia Zone and Mangalia Port out of which 40 are port operators (37 acting in Constanta Port).

Oil Terminal and Rompetrol Logistics Constanta Branch are the most important operators for crude oil and oil products. The Oil Terminal can operate tanks with capacities up to 165.000 dwt, being equipped with specialized facilities for loading and unloading and connected with the pipeline system. The other main operators of liquid bulk are Frial, Romned Port Operator.

The main operators for iron ores, bauxite, coal and coke are Comvex, North Star Shipping, Chimpex, Socep and TTS Operator 250.000 dwt vessels and above can be accommodated and river units are operated in direct or indirect transhipment.

Chemical Products and Fertilizers are operated by Canopus, Chimpex, Frial, North Star Shipping, Socep and United Shipping Agency. These are equipped with dedicated areas for operation and storage of chemical products and fertilizers, bulk phosphate and urea. Vessels up to 30.000 dwt can be accommodated and the total operation capacity of phosphates is 30.000 tons.

The most important stevedoring companies that operate agribulk in the Port of Constantza are Canopus, North Star Shipping, NSS, United Shipping Agency, Silotrans, Chimpex, Comvex and Socep.

In Constanta Port there are four container terminals, which offer modern facilities and operating conditions for portcontainer vessels. The container terminals are operated by Constanta South Container Terminal and Socep.

There are several companies operating general cargo. Perishable goods can be stored in adequate conditions in refrigerated warehouses and are usually handled by specialised stevedoring companies: Frial, Romned Port Operator, Decirom and Socep. Important quantities of timber loaded in the Port of Constanta and dispatched over sea are handled by Decirom, Rotrac, Socep and Umex. Specialised stevedoring companies that are efficiently providing handling operations for metallic products: DB Schenker, Decirom, Romned Port Operator, Socep, TTS Operator and Umex.

The Ferry-Boat terminal is operated by SNTFM CFR MARFA and offers exceptional facilities for the freight loaded in wagons, containers, trucks and transported by ferry vessels and liner services on the Black Sea.

The Passenger Terminal is under the administration of the NC Romanian Ports Administration SA Constanta and has an operation capacity of 100.000 passengers/year.

The facilities of the most important port operators are the following:

Chimpex (owned by Ameropa) (*www.chimpex.ro*) – ***Berths no. 54-63;***

Chimpex is operating a total quay length of 2.26 km including 10 operational berths with water depth of up to 13.5 m. The operating area has 360,000 sqm and total covered storage capacity is 600.000 tons, having a max. daily intake of aprox. 33.000 tons. There are 10 railway tracks and access for road transport.

Comvex (*www.comvex.ro*) – ***Berths no. 80-84; Land use lease***

Comvex has a quay consisting of 5 berths, with a total length of 1,400 m and a depth of water between 10.8 and 19 m. The unloading equipment consists of 3 cranes, each one having a discharge rate of 2,000 mt / hour.

The conveyor system has a total length of 22 km. Two of the main conveyor belts are 1,5 km long and a productivity of 4,000 mt / hour each, and the third one, inaugurated on August 2006, has a length of 2 km and a productivity of 4000 mt / hour.

Currently the Company's management system is unitary. The activity of the Company is managed by a Board of Directors composed of 5 members that guarantees the efficiency of the capacity to supervise, analyze and evaluate the activity of the Company, as well as fair treatment of the shareholders, in accordance with the statutory provisions.

Constanta South Container Terminal (owned by DPWorld) (*www.dpworld.ro*)

The container terminal is located is the Port of Constanta South (**Mol II – S**), and benefits from a total length of operation at the quay of 1,045 m (main berth – 634 m and secondary berth – 411 m), with an excellent deep draught of 14.5 m, being able to accommodate and operate large capacity vessels.

The current capacity of the terminal is approximately 1,200,000 TEU, and there is the possibility of developing this capacity in the future depending on the increase in volumes, which can eventually reach a capacity up to 3,500,000 TEU.

CFS services are able to be accommodated subject to requirements and transloading and unstuffing services are available.

Through its rail terminal, DP World Constanta provides a full rail coordination service. The rail terminal has 3 rail lines, each 600m long, capable of handling 3 complete 30 wagon trains at one time. These lines are operated with 2 x Rail Mounted Gantries with an adjacent stacking yard of 5,000 m2.

North Star Shipping (NSS), formerly named **Minmetal** (owned by ADM) (*www.adm.com*)
ADM is one of the largest port operators in the Port of Constanta in the Black Sea, handling barley, rapeseed, wheat, sunflower seed and corn, as well as various other

commodities such as coal and iron ore. In addition, ADM operates a transport and trading office in Bucharest. ADM has more than 620 employees working in Romania. The services provided by the port operator include sea going vessels and river barges operation, stevedoring, storage, forwarding and inland transport.

NSS (*Berths no. 64-67, no. 85*) is specialist handler of bulk materials/product through three specialized port terminals:

- *Grain terminal*
  - storage capacity 260.000 tons (including meals storage facilities)
  - reception and delivery rate 30.000 tons/day
  - multimodal: road, rail, container, river and maritime dedicated operations
  - Panamax size vessels
- *Raw material terminal* (coal, cokes, iron ore)
  - - efficient facilities to load / unload seagoing vessels, barges and railcars
  - - two specialized open storage platforms with a total capacity 600.000 tons
  - - three platforms for bulk cargo storage totalling 113,500 sqm and a storage capacity of 629,000 tonnes
- *Liquid Terminal* (fertilizers, vegetable oil, diesel biodiesel, gasoline)

Oil Terminal (*www.oil-terminal.com*) - ***Berths no. 69-79;***
Equipments and facilities:

- Petroleum terminal has 7 operational jetties
- Jetties allow berthage of vessels up to 165,000 dwt. capacity
- Connection between storage farms and jetties is done by a 15 km. underground and overground pipelines network
- Pipelines total length is 50 km.

Oil Terminal S.A. has three storage farms through which the following products are handled: crude oil, gasoline, gas oil, fuel oil, chemical and petrochemical products, oils from import or for export and transit.

Socep (*www.socep.ro*) ***Berths no. 51-52, no. 35-37, no. 41-43;***
Socep is part of the *DD Group*. Socep is defined by two distinct terminal structures:

- Container Terminal – 300.000 TEU containers annual handling capacity
- General Cargo Terminal – 3 million tons of bulk and general cargo annual handling capacity

In addition to the two operational terminals, Socep also developed its operations in Constanta South Port, where we are able to perform stuffing/stripping operations.
Main operated cargo:

- Containers
- Dry bulk products
- Break bulk products

The container terminal operates in two berths: D51 and D52, having a total length of 470 m and a platform summing 150.000 sqm. The warehouse is located at the base of the pier, receiving the cargo that is being transported in containers. The terminal has facilities to operate RO-RO vessels.

TTS Operator (*www.tts-group.ro***)** ***Berths no. 100 – 101, 129, 130, 131 and 136,***
The company is specialized in bulk cargo transshipment, forwarding, custom formalities assistance and ship agency services. It operates in direct transshipment (sea vessels - barges/ barge - sea vessels) over 2 million tons/year.
Manoeuvres:
Direct transshipment for bulk and packed/unitized cargo:
Sea vessels – barges
Barges - sea vessels
Wagons - barges and/ or small sea vessels
Small sea vessels/ barges - wagons.

United Shipping Agency S.R.L. (*www.cofcointernational.com***)** ***Berths no. 31, 32, 33***

Starting with the 2014-2015 season, the terminal will have an enhanced storage capacity of 250,00 tons, when the storage facility with a capacity of 50,000 tons becomes operational, which is currently under construction at pier 30-31, designed as an extension of the silo. With the Agigea terminal of pier 102, the total provided storage capacity exceeds 320,000 tons of grains and grit.

The terminal has the highest grains loading rates out of all the terminals from the Black Sea ports. The highest performance on a Panamax ship (101,652 tons DWT) was over 40,000 tons operated in 24 hours – commodities loaded from the silo.

Umex (*www.umex.ro*) ***Berths no. 44, no. 38–40, RORO3;***
In the Umex terminal are handled various cargoes every year:

- Bulk cereals;
- Bulk and bagged fertilizers;
- Project cargo & heavy equipment;
- Metallurgical products;
- Bagged/palletised general cargo.

The Terminal is developed on an area of 140.000 m2, including 120.000 sqm of concrete open platforms and 20.000 sqm of covered warehouses. For vessel operations there are 5 berths with 1020 meters total length, having the possibility to accommodate and operate 6 vessels simultaneously.

The Port of Constanta provides various bunkering facilities within the port area. Private companies offer bunkering services for vessels by tank, terminal and auto from tank trucks.

In order to be in line with the EU Commission strategy regarding the future use of clean fuel for IWT, and to cover the potential demand of the LNG as a clean and economical fuel a LNG bunkering station is planned to be constructed in the river-maritime area of the Port of Constanta.

10.2 Railways of relevance for IWT

This section does not refer to the railways which are physically connecting the port gate with the rest of the railway network as they are assessed in deliverable D.T2.2.1, but to the major and important railway sections of different corridors passing close enough to the ports analyzed in previous section to have an impact to those ports.

Regarding the railway sections in Romania, the following are important for the port development and for the increase of the cargo traffic:

- Railway Constanta - Bucharest – Arad – Curtici
- Railway Bucharest – Galati port
- Railway Bucharest – Craiova – Drobeta Turnu Severin – Timisoara – Arad - Curtici
- Railway Bucharest – Giurgiu port
- Railway Craiova – Calafat port
- Railway Bucharest – Pascani - Siret

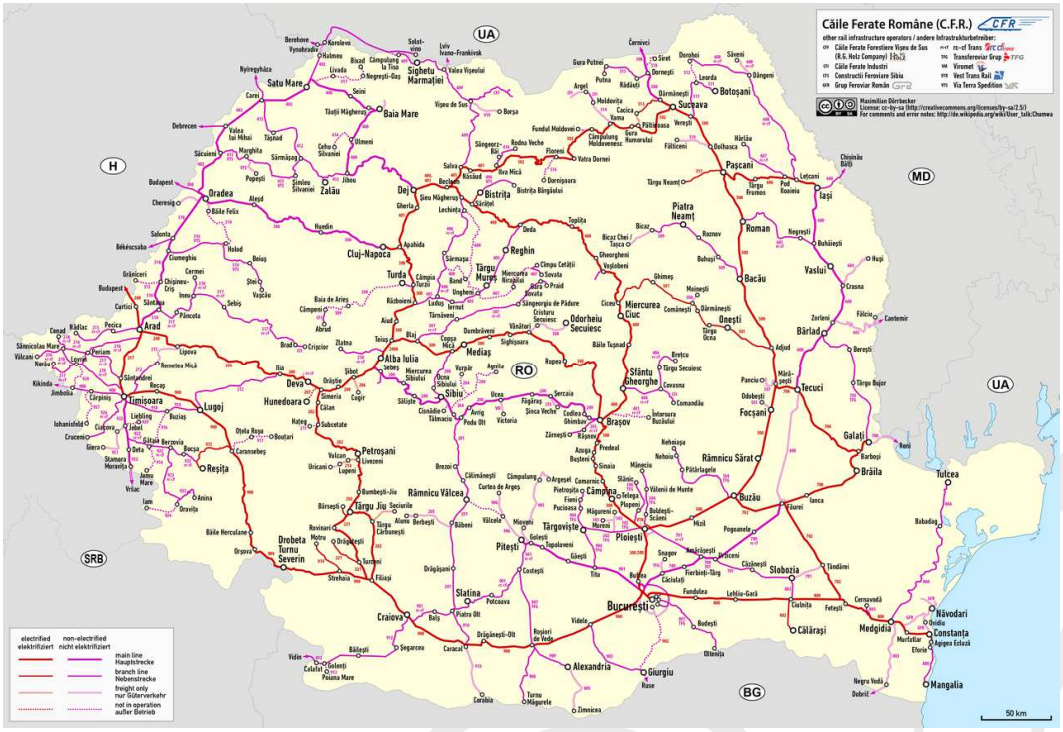

Figure 65: Romanian railway network

10.2.1 Railway section Constanta – Bucharest – Arad - Curtici

Section	Parameter	Value	Unit	Reference in Regulation 1315/2013
Constanta – Bucuresti – Arad - Cutici	Length		876 km	yes
	Electrification		100% of km	§12 except for isolated networks
	Track gauge 1435mm		100% of km	§13 as priority for RR infrastructure development
	Line speed >= 100km/h		80% of km	§39 requirement for core network
	Axle load (>=22.5t)		100% of km	
	Train length (740m)		100% of km	

Table 52: Constanta – Bucuresti – Cluj – Arad – Curtici railway section parameters

Railway line Constanta – Curtici, is a double line, 100% electrified and is used both for passenger and cargo. It is the main route used by the cargo trains transiting Romania from East to West and vice versa.

Constanta – Bucharest section was modernized recently. Bucharest – Ploiesti section is in good condition and allow speeds of 100 km/h for cargo trains. The next section Ploiesti – Brașov cross the Carpathians mountains and the speed for cargo trains is low (average 15 km/h). Brasov – Sighisoara section is under rehabilitation and will permits speeds of 100km/h for cargo trains. Sighisoara – Arad section needs modernization to increase the speed for cargo trains. Arad – Curtici section is rehabilitated and permits high speeds.

Maintenance of the railway line is made by CN CF CFR SA with its own financing. Financial resources are under the real needs.

10.2.2 Railway section Bucharest – Galati Port

Section	Parameter	Value	Unit	Reference in Regulation 1315/2013
Bucharest – Galati port	Length		263 km	yes
	Electrification		100% of km	§12 except for isolated networks
	Track gauge 1435mm		100% of km	§13 as priority for RR infrastructure development
	Line speed >= 100km/h		30% of km	§39 requirement for core network
	Axle load (>=22.5t)		% of km	
	Train length (740m)		% of km	

Table 53: Bucharest - Galati railway section parameters

Railway line Bucharest – Galați, is a double line, 100% electrified and is used both for passenger and cargo. The line is not so much used by cargo trains.

Bucharest – Ploiesti section is in good condition and allow speeds of 100 km/h for cargo trains. The next section Ploiesti – Buzau is in good condition, but it does not allow speeds of 100 km/h. the section Buzau – Galați needs modernization in order to allow speeds of 100km/h. On this section speed is currently low (average 30 km/h).

Maintenance of the railway line is made by CN CF CFR SA with its own financing. Financial resources are under the real needs.

10.2.3 Railway section Bucharest – Craiova – Drobeta T. Severin – Arad - Curtici

Section	Parameter	Value	Unit	Reference in Regulation 1315/2013
Bucharest – Craiova – Drobeta Turnu Severin – Timisoara – Arad - Curtici	Length		631km	yes
	Electrification		100% of km	§12 except for isolated networks
	Track gauge 1435mm		100% of km	§13 as priority for RR infrastructure development
	Line speed >= 100km/h		% of km	§39 requirement for core network
	Axle load (>=22.5t)		% of km	
	Train length (740m)		% of km	

Table 54: Bucharest – Craiova – Drobeta – Timisoara – Arad – Curtici railway section parameters

Railway line Bucharest – Craiova – Drobeta – Timisoara – Arad – Curtici is a double line, 100% electrified and used both for passenger and cargo.

Bucharest – Craiova section is needs modernization in order to allow speeds of 100km/h. A feasibility study for the railway line modernisation is currently on going. The section Craiova – Timișoara is in good condition, but the average speed for cargo trains is on average 50 km/h. The sections Timișoara – Arad and Arad – Curtici permit the speed of 100 km/h for cargo trains.

Maintenance of the railway line is made by CN CF CFR SA with its own financing. Financial resources are under the real needs.

10.2.4 Railway section Bucharest – Giurgiu Port

Section	Parameter	Value	Unit	Reference in Regulation 1315/2013
Bucharest – Giurgiu Port	Length		87 km	yes
	Electrification		% of km	§12 except for isolated networks
	Track gauge 1435mm		100% of km	§13 as priority for RR infrastructure development
	Line speed >= 100km/h		0 % of km	§39 requirement for core network
	Axle load (>=22.5t)		% of km	
	Train length (740m)		% of km	

Table 55: Bucharest – Giurgiu Port railway section parameters

The railway line Bucharest – Giurgiu (67 km) is the first railway line built in Romania, in order to connect the capital city Bucharest with the port of Giurgiu. It was opened in October 1869. Currently the railway line is not electrified and it is not in use since 2005 when a bridge over the Arges river collapsed (Grădistea bridge). In November 2000 it was signed a contract for the modernization of the railway line Bucharest North - Jilava - Giurgiu North – RO-BG Border.

Since 2005 passengers trains were redirected via Videle station – Giurgiu – RO-BG border. The railway line Bucharest – Videle – Giurgiu – border can be used both for passenger and cargo. Cargo traffic is low on Bucharest – Giurgiu railway line.

Maintenance of the railway line is made by CN CF CFR SA with its own financing. Financial resources are under the real needs.

10.2.5 Railway section Craiova – Calafat Port

Section	Parameter	Value	Unit	Reference in Regulation 1315/2013
Craiova – Calafat port	Length		106 km	yes
	Electrification		0 % of km	§12 except for isolated networks
	Track gauge 1435mm		100% of km	§13 as priority for RR infrastructure development
	Line speed >= 100km/h		0 % of km	§39 requirement for core network
	Axle load (>=22.5t)		% of km	
	Train length (740m)		% of km	

Table 56: Craiova – Calafat port railway section parameters

Railway line Craiova – Calafat (107 km) is a partially double line, non –electrified and used both for passenger and cargo. The line is not so much used by cargo trains.

Craiova – Calafat section is not in a good condition, the speed for cargo trains being low (average 35 km/h). The section will be modernized in the next 3 years. Financing for the modernization will be assured from the Operational Sectoral Programme for Transport.

Maintenance of the railway line is made by CN CF CFR SA with its own financing. Financial resources were under the real needs.

10.2.6 Railway section Bucharest – Pașcani - Siret

Section	Parameter	Value	Unit	Reference in Regulation 1315/2013
Bucharest – Pașcani - Siret	Length		498 km	yes
	Electrification		95% of km	§12 except for isolated networks
	Track gauge 1435mm		100% of km	§13 as priority for RR infrastructure development
	Line speed >= 100km/h		20% of km	§39 requirement for core network
	Axle load (>=22.5t)		% of km	
	Train length (740m)		% of km	

Table 57: Bucharest – Pascani Siret railway section parameters

Railway line Bucharest – Pascani – Siret is a double line, 100 % electrified and used both for passenger and cargo. The railway line is used by cargo trains transporting goods on the direction South - North and vice versa. It facilitate the connection of the ports of Constanta, Galati, but also of the other ports on the Danube River with Moldova region of Romania and further with the Ukraine, Poland and Baltic Sea.

Bucharest – Ploiesti line is in good condition and permits speeds of 100 km/h for cargo. Ploiesti – Buzau – Focșani – Bacău – Suceava – Siret – RO/UA needs modernization. The average speed for cargo trains is 50 km/h.

Maintenance of the railway line is made by CN CF CFR SA with its own financing. Financial resources were under the real needs.

10.3 Roads of relevance for IWT

This section does not refer to the roads which are physically connecting the port gate with the rest of the road network as they are assessed in deliverable D.T2.2.1, but to the major and important road sections of different corridors passing close enough to the ports analysed in previous section to have an impact to those ports.

The road transport is the most flexible mode of transport and it is, almost, and unavoidable part of the transport chains, road transport by truck being often the initial and final stage of freight transport. Road transport offers complete freedom to road users to transfer the vehicle from one road to another according to the need and convenience. This flexibility of changes in location, direction, speed, and timings of

travel is not available to other modes of transport. It is possible to provide door-to-door service only by road transport.

The road infrastructure is dense in Romania and comprises highways, national roads (DN) and other kind of roads. Romania has 904 km[19] of highways in operation. 290 km of highways are expected to be in operation until 2025.

Regarding the railway sections in Romania the flowing are important for the port development and for the increase of the cargo traffic:

1. Constanta - Bucharest – Oradea – Borș
2. Bucharest – Galati port
3. Bucharest – Craiova – Drobeta Turnu Severin – Timisoara – Arad - Curtici
4. Bucharest – Giurgiu port
5. Craiova – Calafat port
6. Bucharest – Pascani - Siret

Figure 66: Romanian road network

[19] http://www.cnadnr.ro/sites/default/files/proiecte/Retea%20in%20trafic.pdf

9.4. Rețele globale și centrale:
Drumuri, porturi, terminale feroviar - rutiere și aeroporturi

BE **BG** CZ DK DE EE IE EL ES FR HR IT CY LV LT LU HU MT NL AT PL PT **RO** SI SK FI SE UK

9

Figure 67: Romanian and Bulgarian TEN-T road network

10.3.1 Road section Constanta – București – Oradea - Borș

Category / Section	Parameter	Value	Unit
Highway / National roads Constanta – București – Oradea - Borș	Length	627	km
	Number of lanes (total, in both directions)	4	lanes
	Maximum speed allowed	110 / 90	km/h
	Axle load for trucks allowed	10	t/axle

Table 58: Constanta – București – Oradea - Borș road section parameters

DN1 (Romanian: Drumul Național 1) is an important national road in Romania which links Bucharest with the northwestern part of the country and the border with Hungary via Borș. The main cities linked by DN1 are Bucharest, Ploiești, Brașov, Sibiu, Alba Iulia, Cluj-Napoca and Oradea. The connection with the port of Constanta (Bucharest – Constanta) is the highway A2.

The road the main route for cargo traffic from East to West and viceversa.

On the Comarnic – Brașov section, traffic jams appear very often because of intense traffic volume going in the touristic region of Valea Prahovei (Prahova Valley) and the road narrowing to only two lanes.

The segment of DN1 that serves the area north of Bucharest was upgraded at the end of 2005. It now has three traffic lanes on each side and two new interchanges at the Henri Coandă Airport and the Otopeni bridge. Although it doesn't complete the motorway specifications, the DN1 road can be considered an expressway on certain segments. A modern CCTV system has also been installed on the section from Bucharest to Sinaia to prevent speeding and accidents.

On the Bucharest – Brașov section, driving restrictions apply during daytime from Monday to Friday for vehicles with MPW over 7.5 t and on Saturdays and Sundays for vehicles with MPW over 3.5 t. On the Cluj-Napoca – Oradea section, restrictions apply during daytime on Saturdays and Sundays for vehicles with MPW over 7.5 t (16,535 lb).

The A1 motorway is a partially built motorway in Romania, planned to connect Bucharest with the Banat and Crișana regions in the western part of the country and the rest of Europe. When completed it will be 580.2 kilometers long and it will span the country on the approximatively south-east to north west direction. The motorway starts in the western part of Bucharest and connects the following major cities: Pitești, Sibiu, Deva, Timișoara, Arad, reaching Hungary's M43 motorway near Nădlac.

The A2 motorway, also known as The Motorway of the Sun (*Romanian: Autostrada Soarelui*), is a motorway in Romania which links Bucharest with Constanța, the city and the main maritime port of Romania on the shore of the Black Sea, where it

merges after an interchange into the A4 motorway. It is 206 km long and has been operational on its entire length since November 2012.

The total distance between Bucharest and Constanța on the motorway is approximately 206 km. It includes a 3.8 km link segment at the eastern end, that was part of the construction contract for the A4 motorway, which serves as the Constanța bypass. It has seven exits and ten rest areas on each carriageway, five being served by filling stations. There is one toll gate along the route, at Fetești (km 144), where a tax is charged for crossing the Danube bridges.

During summer, heavy traffic (maximum permissible weight over 7.5 t) is forbidden to drive on the motorway on weekends (including Friday) at daylight hours (from 6 A.M. to 12 A.M.).

The A3 motorway will carry the traffic off from DN1 when it will be completed and will be shorter by 59 km.

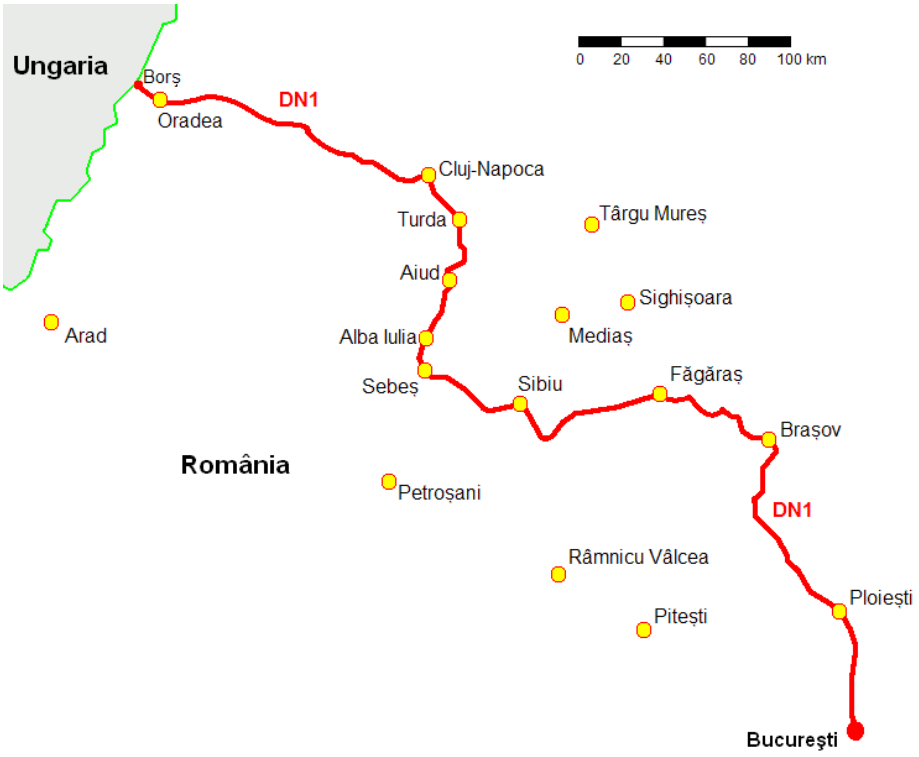

Figure 68: National road DN1 Bucharest - Brașov – Oradea – Borș

Figure 69: A1 Bucharest – Nădlac highway (existing and planned)

Figure 70: Highway A2 Bucharest - Constanta

10.3.2 Road section Bucharest – Galati

Category / Section	Parameter	Value	Unit
Motorway / National road Bucharest - Galati	Length	243	km
	Number of lanes (total, in both directions)	2 / 4	lanes
	Maximum speed allowed	110 / 90	km/h
	Axle load for trucks allowed	10	t/axle

Table 59: Bucharest - Galați road section parameters

The connection between Bucharest and Galați is made by A2 highway and the national road DN 21.

A2 highway and its map are described at the previous subchapter.

DN21 is a national road in Romania which that crosses the Bărăgan Plain, linking the Danube port of Brăila with Călărași. The road crosses the A2 motorway near Drajna, between the cities of Slobozia and Călărași. It underwent in major repairs between 2006 and 2007 on the 24.2 km section between Drajna and Călărași.

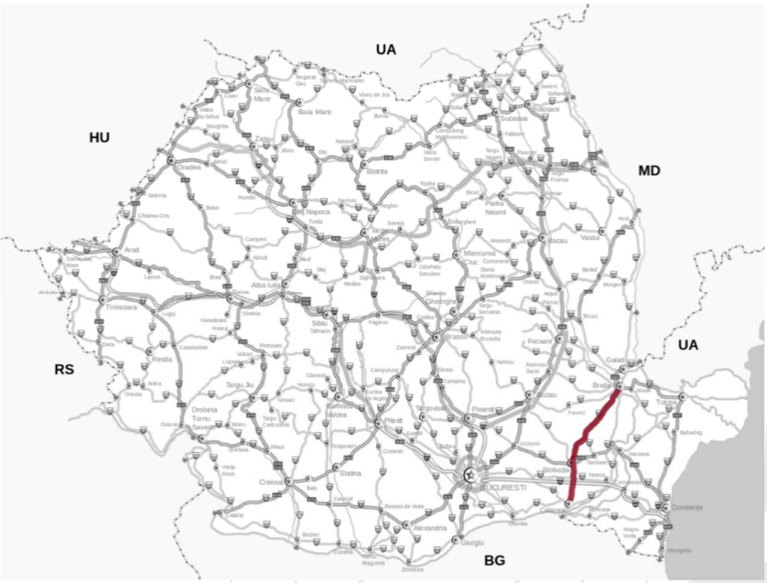

Figure 71: National road DN 21 Călărași - Brăila

10.3.3 Road section Bucharest – Craiova – Drobeta T. Severin – Timișoara - Cenad

Category / Section	Parameter	Value	Unit
Motorway / National road Bucharest - – Craiova – Drobeta Turnu Severin – Timișoara - Cenad	Length	645	km
	Number of lanes (total, in both directions)	2 / 4	lanes
	Maximum speed allowed	90 / 110	km/h
	Axle load for trucks allowed	10	t/axle

Table 60: Bucharest – Craiova – Drobeta T. Severin – Timișoara - Cenad road section parameters

National Road DN6 is a national road in Romania which links Bucharest with the Banat region in the western part of the country and further to the Eastern-European capitals Budapest and Belgrade via the border with Hungary near Cenad. The national road passes through the following municipalities: Alexandria, Caracal, Craiova, Drobeta-Turnu Severin, Caransebeș, Lugoj and Timișoara. Near Gura Văii the road is linked to the Serbian road network via a bridge over the Danube.

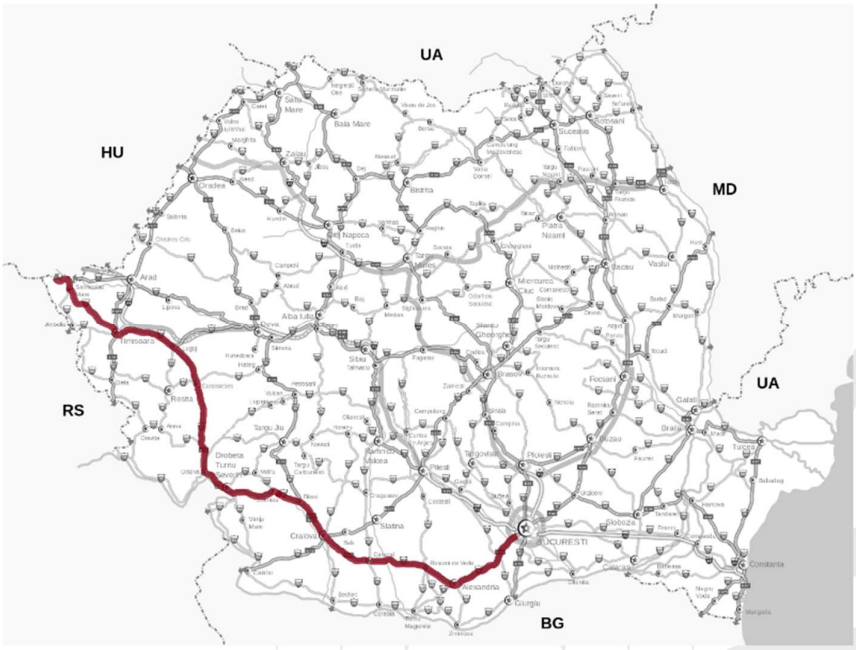

Figure 72: National road DN 6

10.3.4 Road section București - Giurgiu

Category / Section	Parameter	Value	Unit
National Road Bucharest - Giurgiu	Length	68	km
	Number of lanes (total, in both directions)	2	lanes
	Maximum speed allowed	90	km/h
	Axle load for trucks allowed	10	t/axle

Table 61: Bucharest - Giurgiu road section parameters

National Road DN5 is an important national road in Romania which links Bucharest with the Southern country border with Bulgaria by the Giurgiu Russe Friendship Bridge.

DN5 has been designated as a priority express road, being upgraded between 2006 and 2009. Between Bucharest and Giurgiu, for the most part, it is a non-grade separated dual carriageway with no emergency lane, with entrances and exits from adjacent roads using roundabouts. Some segments (such as the Adunații-Copăceni bypass) are constructed to full motorway standard (dual carriageway, full grade-separation, wide median separation).

It is one of the most transited roads in southern Romania, serving as the main connection between Romania's capital, Bulgaria and the rest of Southeast Europe.

As of 2020, a new road that will bypass Giurgiu in the east is under construction. It would remove from the municipality transit and freight traffic to and from Bulgaria. It will be constructed to expressway standards and is estimated to be completed by late 2021.

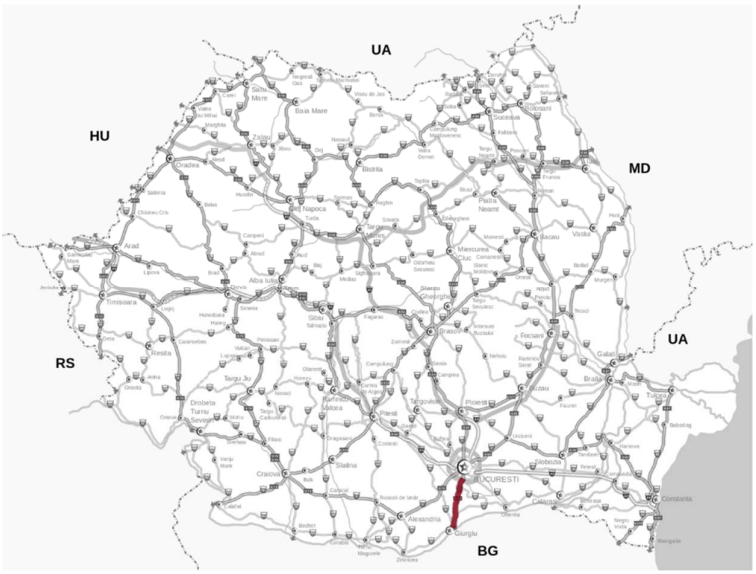

Figure 73: National road DN 5 Bucharest – Giurgiu

10.3.5 Road section Craiova – Calafat

Category / Section	Parameter	Value	Unit
National Road Craiova - Calafat	Length	88	km
	Number of lanes (total, in both directions)	2	lanes
	Maximum speed allowed	90	km/h
	Axle load for trucks allowed	10	t/axle

Table 62: DN 57 Craiova - Calafat road section parameters

DN56 is a national road in Romania, located in Dolj County. It connects the city of Craiova (important industrial city) and the port of Calafat on the Danube River. In Calafat, the road ends at the Calafat-Vidin Bridge, where the Danube can be crossed towards Bulgaria and further Greece or Turkey.

The road is part of E79 which has the following route through Romania: Oradea, Deva, Petroșani, Târgu Jiu, Craiova and Calafat. On this route were built 2 new bridges, 5 rehabilitated bridges, 67 bridges, 17 intersections and 12 parking spaces.

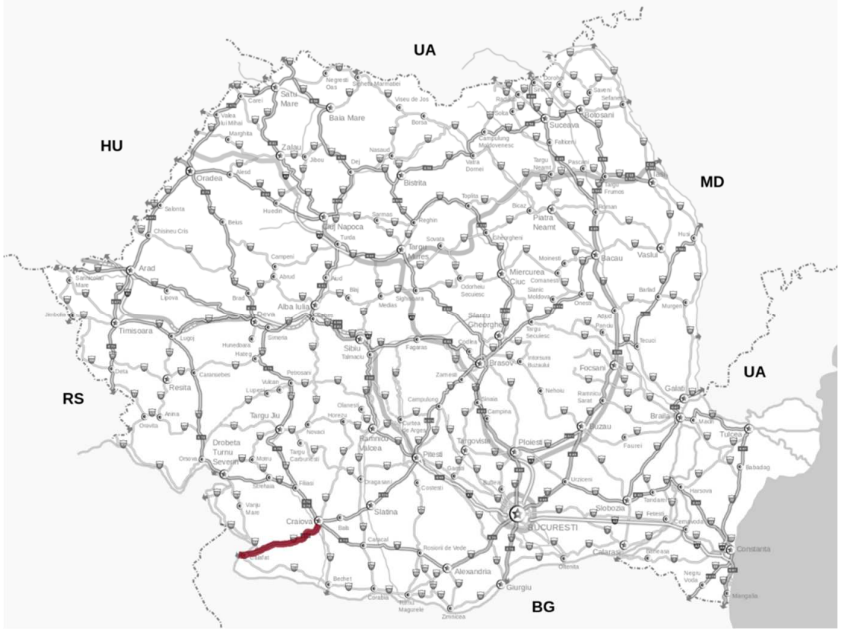

Figure 74: DN 57 Craiova – Calafat

10.3.6 Road section Bucharest – Pascani - Siret

Category / Section	Parameter	Value	Unit
National Road Bucharest – Pascani - Siret	Length	483	km
	Number of lanes (total, in both directions)	2	lanes
	Maximum speed allowed	90	km/h
	Axle load for trucks allowed	10	t/axle

Table 63: Bucharest – Pascani - Siret road section parameters

National Road DN 2 is a national road in Romania which links Bucharest with the historical regions of Moldavia and Bukovina in North-East Romania. Recently upgraded, it is today one of the best-maintained roads in the country. The main cities linked by the DN2 are: Bucharest, Buzău, Focșani, Bacău, Roman, and Suceava. Along the first 350 km from Bucharest to Săbăoani, near Roman the road has two lanes with one narrow emergency lane and reconstructed bridges. The road continues to Siret, at the Ukrainian border as a simple two-lanes road. Together with the adjacent section of DN28, Săbăoani – Iași, part of E583, the DN2 is currently Moldavia's backbone.

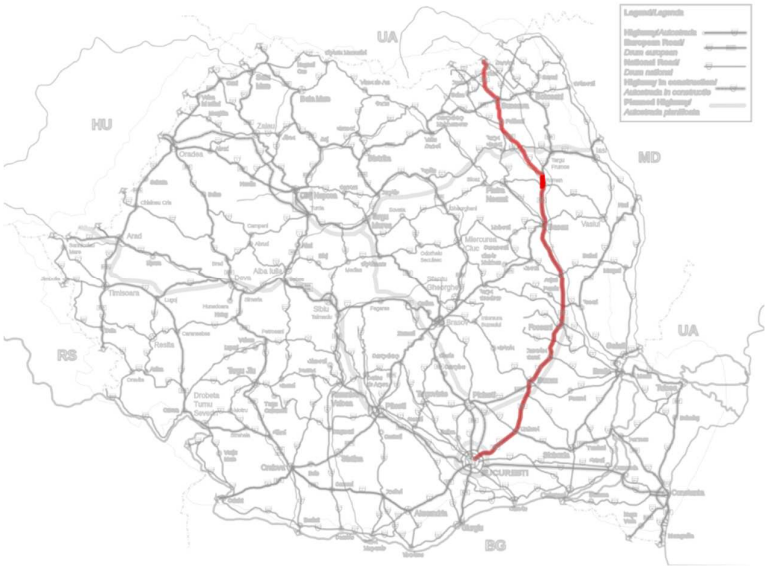

Figure 75: DN 2 Bucharest – Pascani - Siret

10.4 Multimodal terminals outside of ports

Multimodal terminals within ports are analyzed in deliverable D.T2.1.1: "Multimodal facilities and services". Therefore, this section in this report will tackle multimodal terminals close to, but outside of ports, which can have an impact on the throughput of a nearby port or even its development plans.

In Romania there are no multimodal (tri-modal) terminals outside of ports. Around big cities, as Bucharest, Timișoara, Sibiu and Cluj-Napoca there are multimodal terminals (rail / road), built and owned by private companies providing logistic services for cargo. They are functioning as distribution centres. Due to ownership issues, no detailed information on such terminals is available.

11 Transport infrastructure status quo in Bulgaria

11.1 Ports

11.1.1 Port of Lom

11.1.1.1 Position

Port of Lom is a Bulgarian river port of national importance. It is situated on the right bank of the Danube River on km. 742- 743 in the central part of the town of Lom. It is specialized in the handling of general and bulk cargo, passengers, and ship supply. It has 13 berths.

The city of Lom is located in the Montana province, in the north-western part of Bulgaria.

Overview of basic port's features are given in the below table.

Parameters	Explanation / Value
Port land owner (**State**, Region, Municipality, Private, Other)	Ministry of transport, information technology and communication through the state-owned company Bulgarian Ports Infrastructure Company (BPI Co)
Port authority name	Bulgarian Ports Infrastructure Company (BPI Co) and Executive Agency Maritime Administration
Number of operators (concessionaires, lessors)	The two terminals are operated by one private concessionaire.
Total port area (ha)	38.34 ha area, 8 ha of which are free for future development.
Maximum draught (m) - natural or dredged	2.50 m. dredged
Total number of terminals	1
Heavy lift and out-of-gauge handling capacity (Yes/No)	Yes
Ability to handle full block train along the quay (Yes/No)	Yes
Ability to handle full block train in the port area (Yes/No)	Yes
Transhipment equipment for intermodal transport (Yes/No)	Yes
Total quay length (vertical + sloped) (m)	1424 meters

Parameters	Explanation / Value
Vertical quay length (m)	1064 meters
Sloped quay length (m)	360 meters
Undeveloped quay length (m)	
Max number of vessels handled at the same time	13
Max capacity of anchorage or waiting area for barges (number)	5
Storage capacity (m2)	Covered warehouses with a total area of 11 547 sq.m; Open storages with a total area of 117 921 sq.m.
Storage capacity for liquid cargos (m3)	188
Storage capacity (TEU)	Around 1000 TEU
Storage capacity (CEU - car equivalent unit, for Ro-Ro terminals)	Around 80 trucks/trailers
Bunkering facilities within the port area (Yes/No)	Yes
Shore-side power supply for vessels (Yes/No)	Yes
Road connection (Yes/No)	Yes
Rail connection (Yes/No)	Yes
Number of quay cranes of lifting capacity Q < 10 tons	10
Number of quay cranes of lifting capacity 10 < Q < 16 tons	8
Number of quay cranes of lifting capacity 16 < Q < 50 tons	
Number of quay cranes of lifting capacity Q > 50 tons	
Total number of quay cranes	18

Table 64: Basic features of the Port of Lom

11.1.1.2 Ownership, administration (governance) and operation

The infrastructure of all Bulgarian ports of national importance is public state property. The Ministry of transport, information technologies and communication exercises the rights of the Bulgarian state through the state-owned Bulgarian Ports Infrastructure Company (BPI Co). BPICo plays the role of land owner and manages the port infrastructure of the public transport ports of national importance in accordance with the Maritime Spaces, Internal Waterways and Ports of the Republic of Bulgaria Act. More specifically, BPICo is the owner of: the land, quay walls, crane lines, internal port roads, ro-ro ramps, port sewage systems, power, cable networks, port railway lines, lightning network, administrative buildings, open and covered storages, electrical transformer stations, truck weighbridges and similar facilities.

The two terminals are operated by two private concessionaires. Operators usually own cranes, machinery, handling equipment and facilities. They manage the human resources needed for handling – tallymen, dockers, etc. Administrative obligations are fulfilled by two organizations – BPI Co and Executive agency Maritime Administration. Port authority is separated from the port operator. Port operators provide port services and keep the facilities in condition fit for exploitation, and in relevance to all legislative requirements. A concession, according to the Bulgarian law is the right for exploitation of an infrastructure site or service of public interest, granted by a concessor to a company – concessionaire, against the obligation to build, manage and maintain the object of the concession, or to manage the service at his own risk.

11.1.1.3 Hinterland connections

The port of Lom is a point of intersection of the transport corridors No. 4 (West – South) and No. 7 (the Danube). Port of Lom stands 162 kilometers north of Sofia, 56 km. southeast of the city of Vidin, 49 km. north of the city of Montana and 42 km. west of the town of Kozloduy. The port is connected to the national railway network and to the national road network. There are no motorways and first class roads passing through Lom Municipality. Second class road II-81 connects Lom with Montana city and the first class road. The second class road II-81 is the most important road connection, linking Lom with the country. Main railway line № 7 Mezdra – Vidin from the National railway network is single, electrified (including the continuation of the line to the Danube Bridge 2 towards Romania) and with normal track gauge (1435 mm). Its length is almost 192 km. The deviations Brusartsi – Lom connects the port with the Bulgarian railway network. Second class road II – 11 (ring road Vidin - Dimovo) - Simeonovo - Botevo - Archar - Lom – ring road Kozloduy - Oryahovo – Gigen - Brest - Gulyantsi - (Debovo - Nikopol), connects the towns along the Danube.

11.1.1.4 Port infrastructure

Port of Lom is the second largest river port in Bulgaria after Port of Ruse. It disposes of 38.34 ha area, 8 ha of which are free for future development. The port has one basin with 10 berths in Lom and the rest of the berths are located on the river bank. The maintained draft is 2.50 m. dredged. There are some risks and problems connected with the fluctuation of the river level due to periods with low water level, leading to restricted navigation /for all Bulgarian river ports/. That reduces the transshipped

cargo volumes, usually during the summer period. The capacity for cargo handling is bigger than the existing volumes. Port of Lom, being the bigger one, can handle about 3 mln. tons/ year. The port works 12 hours/ day, 7 days a week.

According to the regulations of Executive Agency Maritime administration, there are 5 anchorages in Lom. One of them is for dangerous cargo ships, one for flammable cargo, one for ships, arriving for handling, one for ships finished handling, and one for ships under deratization and fumigation procedures. Maximum number of barges is not specified.

Potential possibility exists for handling full block trains within the territory of the port. Total quay length is 1424 meters with 1064 meters of vertical quay. The maximum number of handled vessels is 13. There is shore-side water and electricity supply. No availability for clean fuels.
The surface of the port working area is covered with asphalt, pavement and reinforced concrete. One of the storage areas located on the eastern quay is not paved. There is no pretreatment of waste waters in Port of Lom and other eco-friendly facilities do not exist. Surface water from the port area is discharged into sewage system. There are no known published future plans for development of such infrastructure in Port of Lom.

11.1.1.5 Port storage facilities

According to port operators' data the total storage (covered and open) area is 129 468 sq.meters. Port terminal Lom is a trimodal multipurpose terminal – "road-railway-river". The length of the rail tracks within the port of Lom is 7176 m. There are 18 cranes in Port of Lom, 8 of which with a maximum lifting capacity of 20 tons.

11.1.2 Port of Ruse

11.1.2.1 Position

The port for public transport of national importance Ruse includes six cargo terminals: Somovit, Svishtov, Ruse-east, Ruse-west, Tutrakan and Ferryboat terminal Nikopol. Port of Somovit is on km 607 of the Danube river. Ferryboat terminal Nikopol is situated on km 597. Port Svishtov is situated on the most southern part of the Danube River on the right riverbank - 554th km. from the river outlet. Port terminal Ruse - West is situated from km 497 to km 496. Port terminal Ruse – east is located on km. 489 - 490 in the Eastern industrial area of the town. This port terminal is the biggest in the Bulgarian part of the river Danube. Port of Tutrakan is located on km. 433.

Overview of basic port's features are given in the below table.

Parameters	Explanation / Value
Port land owner	State
Port authority name	BPICo and Executive Agency Maritime Administration
Number of operators (concessionaires, lessors)	Port complex Ruse JSCo. – operator of Ruse-east, Ruse-centre, Tutrakan and Silistra (passenger terminal), BPICo – operator of Ruse-west 3 private companies (in Svishtov, Somovit and Nikopol) that operate the terminals
Total port area (ha)	131.20 ha port area, and 32 ha of them are for future development
Maximum draught (m) - natural or dredged	2.50 dredged
Total number of terminals	6
Heavy lift and out-of-gauge handling capacity (Yes/No)	Yes
Ability to handle full block train along the quay (Yes/No)	Yes
Ability to handle full block train in the port area (Yes/No)	Yes
Transhipment equipment for intermodal transport (Yes/No)	Yes
Total quay length (vertical + sloped) (m)	4600 meters, of which Svishtov terminal – 902 m Somovit terminal – 350 m Ruse East terminal – 1618 m Ruse West terminal – 1500 m Tutrakan terminal – 110 m Nikopol FT – 130 m
Vertical quay length (m)	1075
Sloped quay length (m)	3417 meters

Parameters	Explanation / Value
Undeveloped quay length (m)	500 m
Max number of vessels handled at the same time	37
Max capacity of anchorage or waiting area for barges (number)	19
Storage capacity (m2)	Svishtov terminal – 28 900 Somovit terminal – 11 875 Ruse East terminal – 206 300 Ruse West terminal – 36 500 Tutrakan terminal – 2 500 Nikopol FT – n/a
Storage capacity for liquid cargos (m3)	0
Storage capacity (TEU)	200 TEU (Ruse-east)
Storage capacity (CEU - car equivalent unit, for Ro-Ro terminals)	160
Bunkering facilities within the port area (Yes/No)	Yes
Shore-side power supply for vessels (Yes/No)	Yes
Road connection (Yes/No)	Yes
Rail connection (Yes/No)	Yes
Number of quay cranes of lifting capacity Q < 10 tons	2
Number of quay cranes of lifting capacity 10 < Q < 16 tons	7
Number of quay cranes of lifting capacity 16 < Q < 50 tons	4
Number of quay cranes of lifting capacity Q > 50 tons	0
Total number of quay cranes	13

Table 65: Basic features of the Port of Ruse

11.1.2.2 Ownership, administration (governance) and operation

The ownership of the land and infrastructure is public. There are 2 state owned companies – Port complex Ruse JSCo. – operator of Ruse-east, Ruse-centre, Tutrakan and Silistra (passenger terminal), BPICo – operator of Ruse-west and 3 private companies (in Svishtov, Somovit and Nikopol) that operate the terminals. Port authorities are BPICo and Executive Agency Maritime Administration. Port authority is separated from port operators. Although there are state owned operators, their function is not different from this of the private operators. BPICo is a temporary operator for port terminals with terminated concession contracts until finalization of the new concession procedures.

11.1.2.3 Hinterland connections

Port of Ruse is a multimodal transport centre and provides suitable connection between three modes of transport – water, rail and road transport. The port is directly connected to the national rail and road network of Bulgaria.
Road entrances are 8, where Ruse-east and Ruse-west have two entrances each. Ruse-east, Ruse-west and Svishtov have rail entrances, as well. Somovit has railway connection that is not in operation. Total length of rails tracks in the terminals is 8759 m. There is no availability of clean fuels in the port of national importance. The only terminal for LNG is located in Ruse and is private. It is not an object of this analysis. There are no waste reception facilities, but plans for building such infrastructure exist. Ships have access to shore-side power and water supply.

11.1.2.4 Port infrastructure

Port of Ruse has 19 anchorages divided by terminals as follows: 4 in Somovit, 1 in Nikopol, 3 in Svishtov, 9 for the aquatory in Ruse and 2 in Tutrakan. Number of vessels per anchorage is not defined. Ruse-east, Ruse-west and Svishtov can handle block trains in the port area. According to published information, only Ruse-east actually handles block trains with containers and trailers. This terminal has the necessary machinery and equipment for transhipment of intermodal units. Total quay length of Port of Ruse is above 4600 meters. Sloped quays prevail with 3417 meters of length. There is 500 m undeveloped quay in Ruse.

Ruse disposes of 131.20 ha port area, and 32 ha of them are for future development. Ruse-east has the biggest potential for future development of new terminals, quays, basins, storage areas etc. There are 37 cargo berths, including the ro-ro ramps. On the territory of Ruse-east and Ruse-west there are two basins with total of 14 berths in them. The rest of the berths are on the open Danube. The maximum draught is 2.50 dredged. Cargo handling capacity is about 8 mln. tons per year and the ability for container handling is estimated to 50 thousand TEU/year, storage has about 15 000 TEU capacity. This capacity is conditional and depends on working hours, technology used, mode of transport, weather characteristics, etc. If demand increases, it is a matter of organization to handle and store even bigger quantities than estimated. Currently all terminals are working far below their capacity.

On the Ro-Ro terminal, located in Ruse-east, there are two parking areas with capacity of 160 trucks. Now, due to low activity of the ro-ro, parking areas are used as storages for agricultural and other machinery and equipment. Terminals within this port work 12 hours/ day and 7 days/ week. There are two ro-ro ramps – one within the territory of Ruse-east and the other is in Ferryboat terminal Nikopol. Svishtov disposes of one specialised pontoon for ro-ro activities and serves the line between Svishtov and Zimnicea, (Romania) across the Danube River. There is no special area for container terminals, although there is actual capacity for handling such type of cargo. Usually port terminals are multipurpose (except the terminal in Nikopol, which has only 1 ro-ro ramp) and rearrange their activity according to clients' needs. From all 6 terminals described, Tutrakan and Nikopol do not have railway access. Ruse-east has the biggest capacity with regard to heavy-lift cargo – 60 tons is the maximum weight of a unit lifted by two cranes simultaneously. The floating crane working in Ruse area, owned by the Agency for Exploration and Maintenance of the Danube River, has lifting capacity of 100 tons.

11.1.2.5 Port's storage facilities

Storage capacity amounts to 286 thousand sq.m., 88% of which are open storages.

11.2 Railways of relevance for IWT

This section does not refer to the railways which are physically connecting the port gate with the rest of the railway network as they are assessed in deliverable D.T2.2.1, but to the major and important railway sections of different corridors passing close enough to the ports analysed in previous section to have an impact to those ports.

There are a few important railways, which are close enough to the Bulgarian ports on the Danube, reviewed in this document – Ruse and Lom. Two of the reviewed railways are part of the core TEN-T network, while the other one is part of the comprehensive TEN-T network.

The nearest railway section to the port of Lom is Mezdra -Vidin. It is the only major railway, which passes through Vidin and Calafat, therefore connecting Bulgaria and Romania.

The Ruse – Gorna Oryahovitsa section is part of a railway, connecting Northern with Southern Bulgaria, while the Ruse – Kaspichan section is part of a railway that connects the biggest Bulgarian city on the Danube with the biggest Bulgarian city on the Black sea.

11.2.1 Railway section Mezdra – Vidin

Section	Parameter	Value	Unit	Reference in Regulation 1315/2013
Mezdra - Vidin	Length	192	km	n/a
	Electrification	100	% of km	§12 except for isolated networks
	Track gauge 1435mm	100	% of km	§13 as priority for RR infrastructure development
	Line speed >= 100km/h	0	% of km	§39 requirement for core network
	Axle load (>=22.5t)	100	% of km	
	Train length (740m)	0	% of km	

Table 66: Mezdra - Vidin railway section parameters

The Mezdra-Vidin section is one of the major railways in the Bulgarian national railway network and is the closest one to the port of Lom. It is part of the Orient/East-Med corridor (part of the core TEN-T network).

The length of the section is a little bit shorter than 192 km. It is divided into three smaller sections – Vidin-Brusartsi, Brusartsi-Boychinovtsi and Boychinovtsi-Mezdra. It is a single-track railway with the exception of a small part between the village of Ruska Byala and Vratsa. The railway is fully electrified with a standard track gauge of 1435 mm. This is also valid for the two small railway branches (to Berkovitsa and Lom). The maximum axle load is the standard 22.5 tonnes.

According to the latest available information (2019-2020) for the maximum allowed speed a freight train can reach on the national railway system, the Mezdra-Vidin section allows 80 km/h. In some parts the speed is limited to 60 km/h.

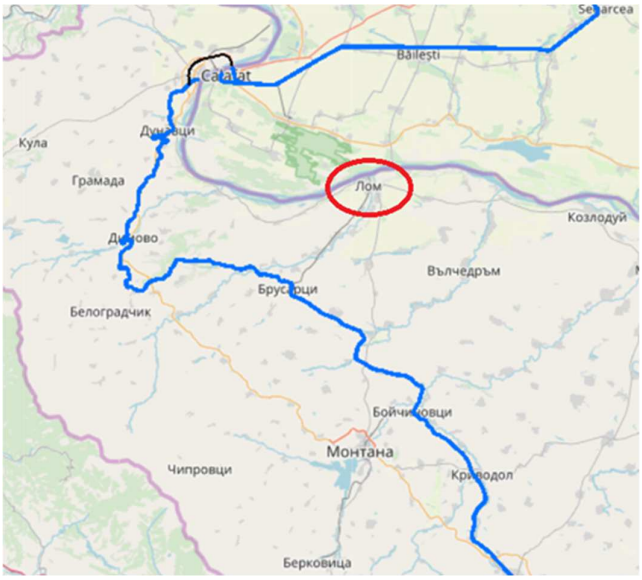

Figure 76: Position of Mezdra – Vidin railway section

11.2.2 Railway section Ruse – Gorna Oryahovitsa

Section	Parameter	Value	Unit	Reference in Regulation 1315/2013
Ruse - Gorna Oryahovitsa	Length	84	km	n/a
	Electrification	100	% of km	§12 except for isolated networks
	Track gauge 1435mm	100	% of km	§13 as priority for RR infrastructure development
	Line speed >= 100km/h	0	% of km	§39 requirement for core network
	Axle load (>=22.5t)	100	% of km	
	Train length (740m)	N/A	% of km	

Table 67: Ruse - Gorna Oryahovitsa railway section parameters

The Ruse-Gorna Oryahovitsa railway is part of the core TEN-T network. It is also part of the Ruse-Podkova railway, which is one of the three cross-mountain railways, connecting Northern and Southern Bulgaria.

The length of the railway section is 84 km. It is a single-tracked, fully electrified railway and has a standard track gauge of 1435 mm. The maximum axle load falls within the standard - 22.5 tonnes.

According to the latest available information (2019-2020), the maximum allowed speed for freight trains doesn't go over 70 km/h. In fact, for the most parts, it is kept at 60 km/h along the railway.

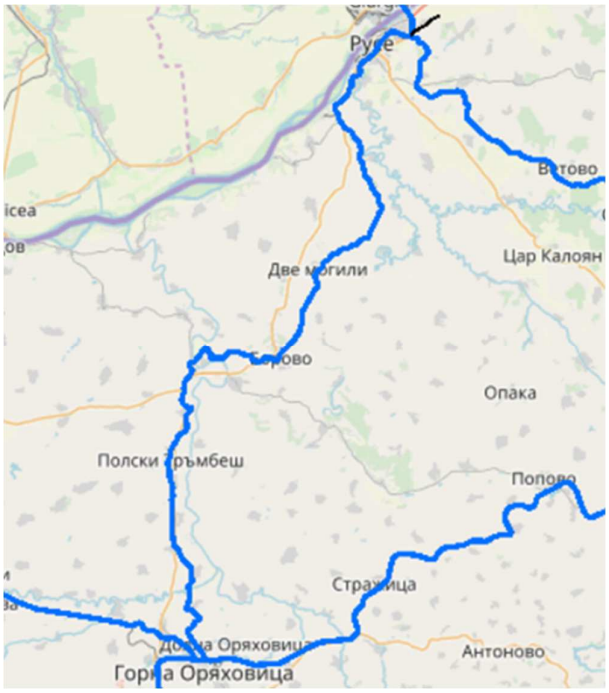

Figure 77: Ruse - Gorna Oryahovitsa railway section

11.2.3 Railway section Ruse – Kaspichan

Section	Parameter	Value	Unit	Reference in Regulation 1315/2013
Ruse - Kaspichan	Length	142	km	n/a
	Electrification	100	% of km	§12 except for isolated networks
	Track gauge 1435mm	100	% of km	§13 as priority for RR infrastructure development
	Line speed >= 100km/h	0	% of km	§39 requirement for core network
	Axle load (>=22.5t)	100	% of km	
	Train length (740m)	0	% of km	

Table 68: Ruse - Kaspichan railway section parameters

The Ruse – Kaspichan section is the first part of the Ruse – Varna railway, which was built in 1866 and is the first railway on the territory of Bulgaria. Nowadays, it is part of the comprehensive TEN-T network.

The railway itself is divided into two main sub-sections – Ruse-Samuil and Samuil-Kaspichan with 10 train stations along the way. It is a single-track railway with a total length of the track of 142 km, fully electrified and with a standard track gauge of 1435 mm. The maximum axle load is within the 22.5-ton standard. In terms of ~~the~~ maximum allowed speed, it generally varies between 60 and 70 km/h with the lowest one being between Samuil and Visoka Polyana – 50 km/h. The maximum train length is 600 m.

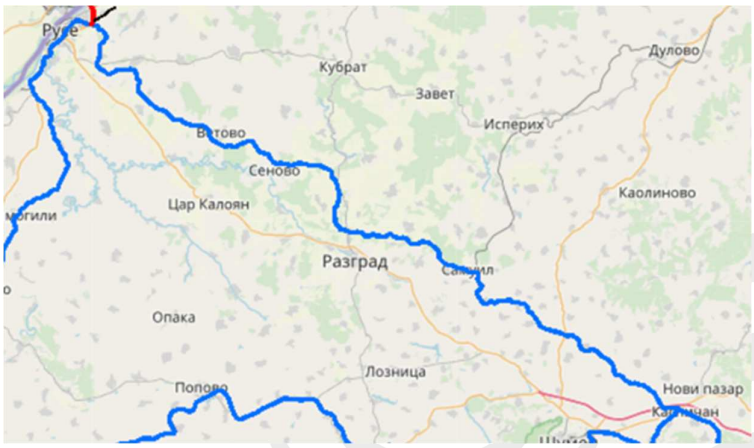

Figure 78: Ruse - Kaspichan railway section

11.3 Roads of relevance for IWT

This section does not refer to the roads which are physically connecting the port gate with the rest of the road network as they are assessed in deliverable D.T2.2.1, but to the major and important road sections of different corridors passing close enough to the ports analysed in previous section to have an impact on those ports.

The three roads, analysed in the sections below, are part of major European road networks. In addition, some of them are part of the TEN-T network, more specifically – the Orient/East – Med corridor. They are also the only major roads passing close enough to the ports and connecting them to the rest of the road network.

11.3.1 Road section Vidin – Kulata

Category / Section	Parameter	Value	Unit
Republican road I-1 / Vidin - Kulata	Length	453.8	km
	Number of lanes (total, in both directions)	2	lanes
	Maximum speed allowed	140	km/h
	Axle load for trucks allowed	24	t/axle

Table 69: Vidin – Kulata road section parameters

Republican road I-1 is part of European road E79. It is a first-class road, which begins at the Vidin-Calafat bridge, bypasses Vidin from the west and then passes through Montana, Vratsa, Botevgrad, Sofia and reaches the Greek border at the Kulata border checkpoint.

Although the road doesn't pass through Lom, the city is connected to it through the II-81 second-class road.

Some parts of the road are interconnected with the Hemus and Struma motorways, therefore the maximum speed allowed in those parts is 140 km/h. Otherwise, the allowed speed in the other sections is 120 km/h. With the exception of the motorway interconnection, the road has two lanes – one in each direction. The maximum load per axle for trucks, referred in the table, is for trucks with three axes.

Figure 79: Vidin – Kulara road section

11.3.2 Road section Ruse – Makaza

Category / Section	Parameter	Value	Unit
Republican road I-5 / Ruse - Makaza	Length	397.3	km
	Number of lanes (total, in both directions)	2	lanes
	Maximum speed allowed	120	km/h
	Axle load for trucks allowed	24	t/axle

Table 70: Ruse – Makaza road section parameters

Republican road I-5 is part of European road E85. In fact, I-5 follows the E85 road from Ruse to Haskovo. The road starts at the Danube bridge and bypasses Ruse from the south. It passes near Byala and Veliko Tarnovo, continues south through the Balkan Mountains, bypasses Stara Zagora, intersects the Maritsa highway and ends at the Kapitan Andreevo checkpoint.

It is a first-class road. There are plans to build a Ruse-Veliko Tarnovo motorway, which will supersede the I-5 road at least in the section between those two cities.

Since the road is essentially an “express highway”, the maximum allowed speed is 120 km/h. There is one lane in each direction – two overall. The maximum load per axle for trucks, referred in the table, is for trucks with three axes.

Figure 80: Ruse – Makaza road section

11.3.3 Road section Ruse – Varna

Category / Section	Parameter	Value	Unit
Republican road I-2 / Ruse - Varna	Length	203	km
	Number of lanes (total, in both directions)	3	lanes
	Maximum speed allowed	140	km/h
	Axle load for trucks allowed	24	t/axle

Table 71: Ruse – Varna road section parameters

Republic road I-2 is one of the major roads in Northeastern Bulgaria. It connects the city of Ruse with Varna and is part of the European road E70.

On its way to Varna, the road passes around the cities of Razgrad and Shumen. Between Ruse and Shumen the road has been expanded to a 3-lane single carriageway. From Shumen to Varna, it is a 2-lane road. When the road reaches the village of Belokopitovo, it starts running parallel to the Hemus motorway and intersects it on two occasions.

Since the road is an express highway, the maximum allowed speed is 120 km/h. The maximum load per axle for trucks, referred in the table, is for trucks with three axes.

Figure 81: Ruse – Varna road section

11.4 Multimodal terminals outside of ports

Multimodal terminals within ports are analysed in deliverable D.T2.1.1: "Multimodal facilities and services". Therefore, this section in this report will tackle multimodal terminals close to, but outside of ports, which can have an impact on the throughput of a nearby port or even its development plans.

There is only one core network terminal outside of the territory of the ports – Ruse Tovarna in the city of Ruse. It has two handling tracks of approximately 100 m. of usable length. According to market investigations the terminal is currently not used, thus the handling volume is zero. As most of the terminals in Bulgaria this facility was established some thirty years ago, but not well maintained and used in a proper way. Thus, the technical and infrastructure conditions of the facility are not state-of-the-art either.

12 Transport infrastructure status quo in Moldova

12.1 Ports

12.1.1 Port of Giurgiulesti

12.1.1.1 Position

Giurgiulesti International Free Port is situated at 133.8 km / 72.2 nautical miles from the Black Sea on the maritime section of the river Danube, with available water depths of up to 7m. GIFP benefits from its strategic location in close proximity to Moldova's borders with Romania and Ukraine. Due to its easy access to the Black Sea with maritime vessels, to countries located along the Danube with river barges as well as inland rail connections to both the CIS and EU countries, GIFP is developing into a major logistics hub not only for Moldova, but for the entire region. GIFP is capable of receiving both inland and sea going vessels. GIFP serves its client as a regional logistics hub on the border of the EU with access to road, standard-gauge railway and broad-gauge railway, as well as to river and sea vessels. It is the only direct sea/river-borne transhipments and distribution point to and from the Republic of Moldova and due to its strategic location and excellent location for business development with a unique customs and tax regime.

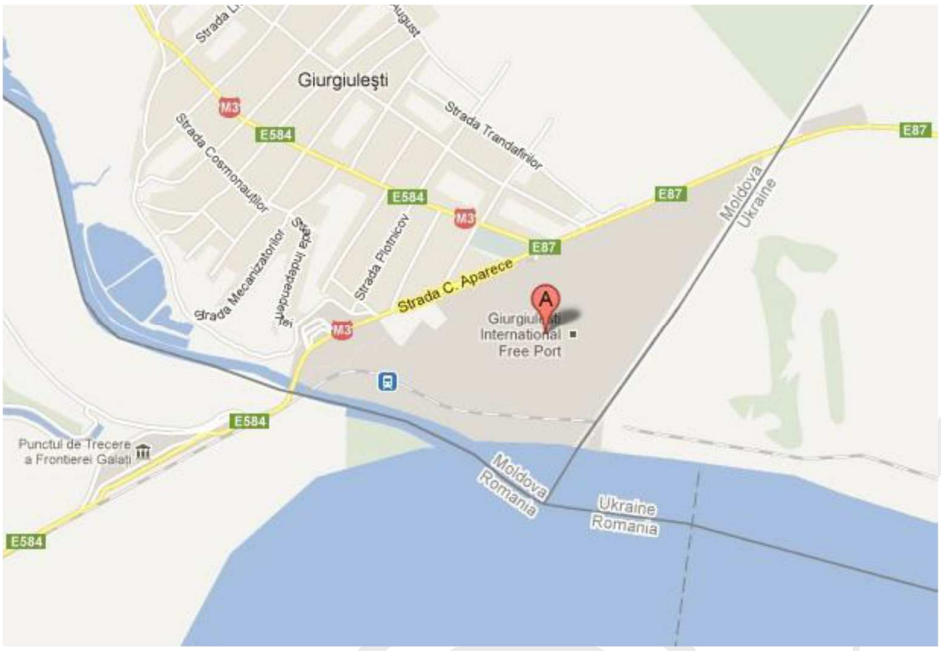

Figure 82: Position of the Giurgiulesti Free International Port

At the moment, the exit for the Republic of Moldova, the exit to the bank of the Danube River is the only exit to the river with a full-fledged navigation mode.

Despite the rather modest length of the coastline on the Danube (River-km 133.59-134.14), as well as at the mouth of the Prut River, the port handles the cargo flows generated by the national economy.

Overview of basic port's features are given in the below table.

Parameters	Explanation / Value
Port land owner (State, Region, Municipality, Private, Other)	State
Port authority name	Giurgiulesti International Free Port
Number of operators (concessionaires, lessors)	C.S. "Danube Logistics" SRL
Total port area (ha)	120
Maximum draught (m) - natural or dredged	7
Total number of terminals	4
Heavy lift and out-of-gauge handling capacity (Yes/No)	Yes
Ability to handle full block train along the quay (Yes/No)	No
Ability to handle full block train in the port area (Yes/No)	Yes
Transhipment equipment for intermodal transport (Yes/No)	Yes
Total quay length (vertical + sloped) (m)	780
Vertical quay length (m)	780
Sloped quay length (m)	0
Undeveloped quay length (m)	220
Max number of vessels handled at the same time	4
Max capacity of anchorage or waiting area for barges (number)	2
Storage capacity (m2)	20000
Storage capacity for liquid cargos (m3)	63600 (petroleum products); 6000 (vegetable oils)
Storage capacity (TEU)	210

Parameters	Explanation / Value
Storage capacity (CEU - car equivalent unit, for Ro-Ro terminals)	-
Bunkering facilities within the port area (Yes/No)	Yes
Shore-side power supply for vessels (Yes/No)	Yes
Road conneection (Yes/No)	Yes
Rail connection (Yes/No)	Yes
Number of quay cranes of lifting capacity Q < 10 tons	0
Number of quay cranes of lifting capacity 10 < Q < 16 tons	1
Number of quay cranes of lifting capacity 16 < Q < 50 tons	0
Number of quay cranes of lifting capacity Q > 50 tons	1
Total number of quay cranes	2

Table 72: Basic features of the Port of Giurgiulesti

12.1.1.2 Ownership, administration (governance) and operation

OWNERSHIP

The legislative framework that regulates the port's activities is established in the Investment Agreement "On the Free International Port of Giurgiulesti", approved by Law no. 7-XV of February 17, 2005, Law on the Giurgiulesti International Free Port no. 8-XV of 17 February 2005 and the Agreement between the Government of the Republic of Moldova and ICS "Danube Logistics" SRL of 21 April 2005 - the general investor and the port operator. The Investment Agreement signed with the Ministry of Economy in December 2004 leases the land for a period of 25 years and confers the status of "free economic zone" on the entire territory of the port until 2030.

GENERAL INVESTOR AND OPERATOR

ÎCS Danube Logistics SRL, a limited liability company, is the general investor and operator of the Giurgiulesti International Free Port. In December 2004 Danube Logistics signed an investment agreement with the Government of the Republic of Moldova for the construction of the Giurgiulesti International Free Port.

Giurgiulesti International Free Port offers its customers:

- port services;
- multimodal logistics services (transhipment and transportation of goods by sea, river, rail and car);
- office space rental services, warehouses, production spaces within the Business Park with the status of Free Economic Zone;
- long-term land lease services within the Business Park with the status of Free Economic Zone.

12.1.1.3 Hinterland connections

Giurgiulesti International Free Port (GIFP) is located in the southernmost geographical point of the Republic of Moldova. This creates some problems for organizing sustainable links with the hinterland of the country. It should be borne in mind that before the opening of the port in 2005, the settlement of Giurgiulesti was not a cargo-forming center.

Giurgiulesti International Free Port is the only three modal (Road, Rail, IWW) transport hub in the country.

Near the port there is a railway junction (station Giurgiulesti) of the state enterprise "Moldovan Railway".

Through this station, external communications with Romania are provided (for this there is a mixed track from 1520 mm to 1435 mm) and with Ukraine through the nearest station Reni.

In connection with the growth in traffic through GIFP and in order to reduce the transit time for trains through Ukraine, the Cahul-Giurgiulesti railway line was opened in 2008.

Currently, the port of Giurgiulesti has a direct connection with all the main internal railway stations: Chișinău, Basarabeasca, Ungheni, Balti, Ocnita.

The M3 highway of international importance (Chiăinău - Giurgiulesti) is the only road connecting the port with the hinterland of the country and with the Danube region of the European Union. With the growth in the volume of cargo transportation from the port by road transport, the asthma in its restructuring has sharply increased.

With the opening of the Giurgiulesti International Free Port and the growth of the country's economic potential, interest has increased in the rehabilitation of navigation along the Prut River along the entire Giurgiulesti-Ungheni section. Currently, there are only local sections with local navigation on the Prut River.

12.1.1.4 Port infrastructure

The GIFP infrastructure is located compactly and well thought out, based on the transportation needs specific to the region's economy and maritime transport. The port berths are located directly on the bank of the Danube River (360 m) and along the bank at the mouth of the Prut River (640 m).

Due to the strong impact of the water flow, the berths require massive coastal fortifications, as well as annual bottom dredging works.

The vertical design of berths with a depth of up to 7 m on the Danube River and up to 5 m on the Prut River allows direct mooring of river-sea class vessels.

The berths are specialized. One berth serves the oil terminal, two berths are intended for a grain terminal and loading vegetable oil, and another one for containers and general cargo.

To carry out transhipment operations, the port is equipped with modern handling and transport equipment with high productivity. Electricity is supplied to the pier especially for storing containers of refrigerators.

The direct rail connection of the berth can significantly increase work productivity.

At the moment, the port has about 220 m of the coastline that is not adequately fortified. The work on the construction of a berth on this section is planned in the long-term plans.

12.1.1.5 Port's storage facilities

Giurgiulesti International Free Port has the following storage facilities:

- Grain storage terminals with railway connection
- Grain warehouses
- Petroleum oil storage tank farm
- Ethanol/wine storage facilities
- Vegetable oil storage tank farm
- multi-purpose warehouse

Open storage areas for:

- aggregates, coal, scrap metal, container.

12.2 Railways of relevance for IWT

The sustainable operation of the Giurgiulesti International Free Port (GIFP) largely depends on the current state of the railway and the prospects for its development.

Three railway sections have a direct impact on the functioning of the port:

a) providing communication with the hinterland of the country;

- Giurgiulesti-Reni-Etulia-Basarabeasca;
- Giurgiulesti-Cahul;

b) providing external communication with Romania:

- Giurgiulesti-Galati.
- Giurgiulesti-Galati.

12.2.1 Railway section Giurgiulesti - Basarabeasca

The section under consideration provides a connection between two important railway junctions of strategic importance for the development of the country's economy.

The Basarabeasca junction station is one of the main ones for the formation of trains in the direction of Romania and Ukraine.

Delivery of goods to the port of Giurgiulesti is carried out in transit through the Ukrainian section of the railway along the route: Basarabeasca-Etulia-Reni-Giurgiulesti.

Transportation of goods in transit through Ukraine creates additional logistics costs.

One of the main disadvantages of the section in question is the large time required for transportation. This is due to the low speeds of trains and the long process of forming trains.

The main reasons for low speed are:

- highly rugged terrain;

- significant wear and tear of railway tracks.

Currently, the average speed is 30 km / h.

The main transported goods include: containers, grain, agricultural fertilizers, fuel, coal, metal.

Section	Parameter	Value	Unit	Reference in Regulation 1315/2013
Giurgiulesti - Basarabeasca	Length	153	km	n/a
	Electrification	1	% of km	§12 except for isolated networks
	Track gauge 1435mm	0	% of km	§13 as priority for RR infrastructure development
	Line speed >= 100km/h	0	% of km	§39 requirement for core network
	Axle load (>=22.5t)	0	% of km	
	Train length (740m)	0	% of km	

Table 73: Giurgiulesti - Basarabeasca railway section parameters

12.2.2 Railway section Giurgiulesti - Cahul

The 1520 mm gauge railway Giurgiulesti - Cahul was built in 2008 with the aim of increasing the volume of cargo transported through the port. However, its construction was carried out with a number of violations of building codes. From time to time, during spring floods on the Prut River, railways are damaged in some sections. All this sharply reduces traffic safety and the intensity of operation.

Section	Parameter	Value	Unit	Reference in Regulation 1315/2013
Giurgiulesti- Cahul	Length	50	km	n/a
	Electrification	0	% of km	§12 except for isolated networks
	Track gauge 1435mm	0	% of km	§13 as priority for RR infrastructure development
	Line speed >= 100km/h	0	% of km	§39 requirement for core network
	Axle load (>=22.5t)	0	% of km	
	Train length (740m)	0	% of km	

Table 74: Giurgiulesti- Cahul railway section parameters

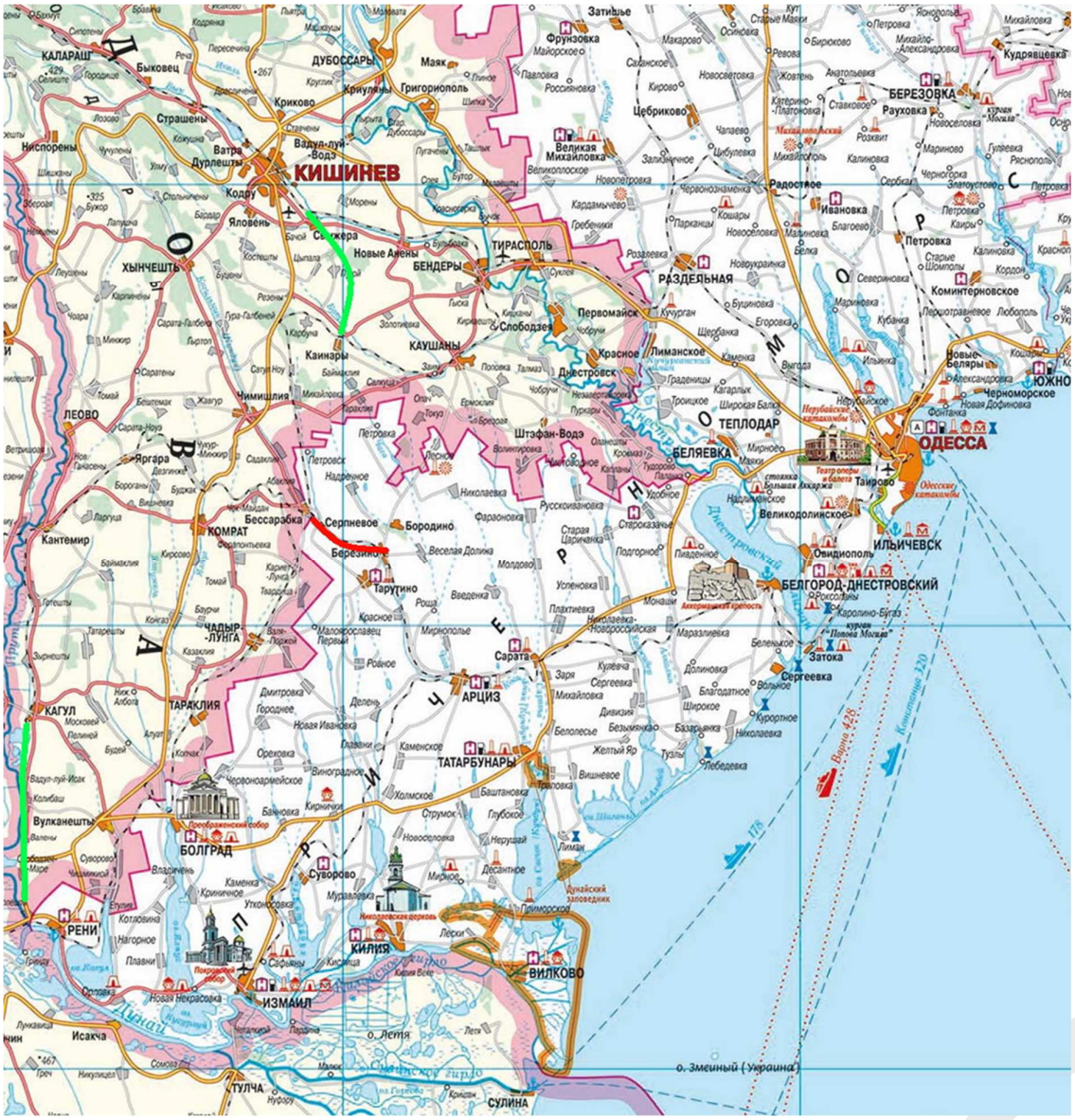

Figure 83: Map of railways of Moldova and Odessa region of Ukraine.

(Green line marks the new railway lines built by Moldova, Revaca-Cainara (2005) and Cahul-Giurgiulesti (2008)).

12.2.3 Railway section Giurgiulesti - Galat

At the moment, the Republic of Moldova has two existing railway sections for the implementation of external relations with Romania: Ungheni and Giurgiulesti. Both railway junctions have a double track of 1520 mm and 1435 mm. Between the Giurgiulesti-Galat stations, there is a double track along the entire length of the railway section. The immediate significance of this section for the port of Giurgiulesti

is not significant. But for direct rail transport between neighboring friendly countries, this section is of strategic importance.

Section	Parameter	Value	Unit	Reference in Regulation 1315/2013
Giurgiulesti-Galat	Length	12	km	n/a
	Electrification	0	% of km	§12 except for isolated networks
	Track gauge 1435mm	100	% of km	§13 as priority for RR infrastructure development
	Line speed >= 100km/h	0	% of km	§39 requirement for core network
	Axle load (>=22.5t)	0	% of km	
	Train length (740m)	0	% of km	

Table 75: Giurgiulesti-Galat railway section parameters

12.3 Roads of relevance for IWT

The connection of the Giurgiulesti International Free Port with the main cargo-forming centers of the country is carried out by the only road along which, due to its high bearing capacity, the movement of heavy vehicles is allowed: Giurgiulesti-Slobozia Mare-Vulcanesti-Comrat-Kishinev.

The international road M3 Giurgiulesti-Kishinev is an integral part of the national transport network. Its importance is strategically important for the development of the economy of the south of the country and for external relations with the Danube region.

12.3.1 Road section Kishinev - Giurgiulesti

Before the opening of the port of Giurgiulesti, the section in question was not very much in demand for heavy vehicles, especially on the section: Vulcanesti-Slobozia Mare-Giurgiulesti. However, in recent years, due to a sharp decline in the competitiveness of the state-owned enterprise Railways of Moldova, the volume of road transport has increased significantly. Taking into account these trends, it is necessary to envisage an increase in the bearing capacity of the M3 road in the long-term plans for the development of transport infrastructure, and the planned projects for the rehabilitation of certain sections of the road should be revised.

There is only one alternative to the M3 section under consideration. This is the road of republican significance R34: Giurgiulesti-Cahul-Kantemir-Liova-Hîncesti-Kishinev.

But due to the difficult terrain and the large number of crossed settlements, it is significantly inferior to the M3 highway in many important criteria, including

investment efficiency and environmental friendliness. As a result, most of the road rehabilitation and construction projects currently being implemented are related to M3.

Category / Section	Parameter	Value	Unit
Expressway M3: Chisinau - Comrat - Giurgiulesti - border with Romania	Length	220	km
	Number of lanes (total, in both directions)	2	lanes
	Maximum speed allowed	90	km/h
	Axle load for trucks allowed	10	t/axle

Table 76: Kishinev-Giurgiulesti road section parameters

Figure 84: Map of main roads of Moldova

12.4 Multimodal terminals outside of ports

Multi-modal container transportation to / from the Republic of Moldova is carried out mainly through the foreign ports of Ilyichevsk (Ukraine) or Constanta (Romania) or Giurgiulesti International Free Port. Thus, at present, the Republic of Moldova has the only port with three modal terminals, specializing in container transport.

In the period (2016-2019) before the crisis years, TEU traffic through the port of Giurgiulesti was 8-9 thousand containers per year.

Transportation of containers from the ports of Odessa and Constanta, as a rule, is carried out by road transport directly to the consignee.

Delivery of containers to customers from the port of Giurgiulesti is carried out by road or rail. Both transportation options face certain challenges. In the case of road transport of containers, the problem is associated with high loads on the axle of the vehicle and the weak bearing capacity of the road in some sections. In this situation, it would be necessary to prohibit the transportation of containers by road and administratively oblige their transportation only by rail. However, the main problem of the railway is an unreasonably large loss of time for transportation, as well as an unacceptable service for the client in terms of quality / cost.

From the port of Giurgiulesti, containers are transported along the railway line: Giurgiulesti-Reni-Etulia-Basarabeasca-Kishinev and further along the western or northern railway corridor to the destination station.

On the section of the southern railway corridor, which is directly connected to the Giurgiulesti International Free Port, it is strategically important for the normal functioning of the Basarabeasca junction station located on the border with the Republic of Ukraine. It is through the Basarabeasca station that it is possible to carry out a railway connection between Odessa and Kishinau with the capitals of the European countries of Romania and Bulgaria.

Figure 85: Junction railway station Basarabeasca

13 Transport infrastructure status quo in Ukraine

13.1 Ports

13.1.1 Port of Reni

13.1.1.1 Position

The seaport of Reni is an important transport hub in Ukraine, which closely connects sea, river, rail and auto roads. The optimal route from the Danube European countries to the Caucasus, Iran, the short route of delivery of goods from Turkey, Greece to the Baltic countries, Russia, Scandinavia passes through the port of Reni. Reni is located on the map of three international transport corridors: VII Danube Pan-European, IX International land, and international highway E-87 as well as the international cooperation programs TRACEKA and the trans-European transport network TEN-T, see fig.89.

Navigation takes place throughout the entire calendar year. The maximum depths at the berths are 3.5–12 m (7.5 m on average), which allows handling any type of cargo operating on the Danube.

The length of the berths is 3,611 m. The design capacity of the Reni port is 14.5 million tons.

Figure 86: Port of Reni scheme

Figure 87: Port of Reni

Position

Reni Port (42 ° 26 "N / 28 ° 18 'E) is located within the strip from 123.8 to 128.4 km of the left bank of the Danube River. 115.8 km to 131.5 km from the left bank to the conditional state border of Ukraine along the Danube river.

Overview of basic port's features are given in the below table.

Parameters	Explanation / Value
Port land owner (State, Region, Municipality, Private, Other)	State
Port authority name	Reni branch of USPA
Number of operators (concessionaires, lessors)	11
Total port area (ha)	94.36
Maximum draught (m) - natural or dredged	12
Total number of terminals	37
Heavy lift and out-of-gauge handling capacity (Yes/No)	Yes
Ability to handle full block train along the quay (Yes/No)	Yes

Parameters	Explanation / Value
Ability to handle full block train in the port area (Yes/No)	Yes
Transhipment equipment for intermodal transport (Yes/No)	Yes
Total quay length (vertical + sloped) (m)	3936
Vertical quay length (m)	2876
Sloped quay length (m)	1060
Undeveloped quay length (m)	800
Max number of vessels handled at the same time	11
Max capacity of anchorage or waiting area for barges (number)	42
Storage capacity (m2)	204900
Storage capacity for liquid cargos (m3)	100000
Storage capacity (TEU)	250
Storage capacity (CEU - car equivalent unit, for Ro-Ro terminals)	120
Bunkering facilities within the port area (Yes/No)	Yes
Shore-side power supply for vessels (Yes/No)	Yes
Road connection (Yes/No)	Yes
Rail connection (Yes/No)	Yes
Number of quay cranes of lifting capacity Q < 10 tons	-
Number of quay cranes of lifting capacity 10 < Q < 16 tons	25
Number of quay cranes of lifting capacity 16 < Q < 50 tons	5
Number of quay cranes of lifting capacity Q > 50 tons	1
Total number of quay cranes	31

Table 77: Basic features of the port of Reni

13.1.1.2 Ownership, administration (governance) and operation

All land in the port of Reni belongs to the State Enterprise Reni Commercial Sea Port, which was founded by Ukraine, represented by the Ministry of Infrastructure of Ukraine. The infrastructure and superstructures located in the port of Reni are owned by private and state-owned companies. Administrative and economic activities in the Reni seaport are carried out by the State Enterprise "Administration of the seaports of Ukraine".

13.1.1.3 Hinterland connections

The Reni seaport has an extensive road/rail network. The length of the railways is 13.4 km, and the road is 6.2 km. Port`s roads are connected with the Bucharest - Reni - Odessa highway, as well as the Reni - Chisinau highway. The Reni port's railway tracks are connected with the railway tracks of the Reni station and have a railway connection Reni-Galati, Reni-Chisinau, Reni - railway stations of Ukraine.

Deep water fairway (further- DWF) Danube - Black Sea - see Fig. 88, one of the elements of the program for the development of a national network of international transport corridors and its integration into the transport system of the countries of Europe, Asia, the Baltic and the Black Sea pool. The total length is 172.2 km.

The DWF route along natural Danube`s water fairway: Port Reni - Izmail Chatal - 44.1 km long; Izmail Chatal - Vilkovo port - 98 km long; Port Vilkovo - Black Sea (through Starostambul and Bystre Danubes mouth) - 17 km long; The artificial part of the DWF route - the sea approach channel through the sea bar in the area of the Bystry branch - 3.4 km long.

The first stage of construction of DWF was completed. The implementation of the second stage will ensure round-the-clock, two-way regulated ship traffic.

The resumption of navigation along the Ukrainian section of the Danube may become one of the most effective measures of the European integration course declared by Ukraine. The full-fledged development of the Deep water fairway opens up opportunities for unlimited expansion of logistics schemes for freight flows along the East-West vector.

13.1.1.4 Port infrastructure

The port infrastructure consists of three cargo areas, a ferry complex and an oil station. The port has 37 specialized berths, 31 of which are cargo ones, for handling general, liquid, timber, heavy, container, packaged cargo, bulk cargo, wheeled vehicles and passenger ships. The total length of berths in the port is 3,927 m. The berths are located along the left bank of the Danube, as well as in the backwater of the port.

The port also has 2 specialized terminals. The first terminal is in the backwater. Berth No. 22 is equipped with a crane with a lifting capacity of 250 tons and is used for heavy

and oversized cargo. The length of the berth is 125 m and the depth at the wall is 3.5 m.

The second terminal can handle Ro-Ro vessels up to 80 m long with a depth of 3.5 m at the berth. The Ro-Ro terminal and the adjacent outdoor parking area of 19.150 m² have not been used since the Ruse line (Bulgaria)-Reni has stopped her work.

Utility infrastructure (electricity, water, sewerage) as part of the port infrastructure belongs to the State Enterprise USPA. The technical condition of the infrastructure networks, equipment and facilities corresponds to their service life. All devices are in working order, properly handled, maintained and used in accordance with manufacturer`s recommendations, standards and relevant legislation.

Crane equipment. Portal cranes for handling heavy and oversized cargo were purchased by the port in 1986. Currently, the following cranes are used: Albatross type with lifting capacity -10t, Sokol type with lifting capacity - 16-20t, Condor type with lifting capacity - 32-40t. The port also has one KATO truck crane with a lifting capacity of 50 tons, overhead crane with a lifting capacity of 250 tons, floating cranes - with lifting capacity from 5 to 100 tons, auto and electric loaders with lifting capacity from 1.5 to 10 tons, special tractors, roll trailers, grain all-weather pneumatic loader, wagon unloader. Most of the transshipment technologies at the port are at the end of their life cycle.

Transshipment of oil products (diesel fuel and gasoline) is possible in export, transit and import modes. Transshipment of oil products is carried out at 3 port terminals - by 4 port operators, the total volume of one-time storage is 110 thousand tons. The work is ensured according to the standards of modern technology of overloading in accordance with the requirements of environmental, technogenic and technical safety. The capacity for transshipment of oil products is up to 500 tons / hour.

Oil and liquid chemicals (transported from the Caucasus through the ports of Georgia) are served at a special terminal located in the backwater, with tanks with a capacity of 60,000 tons and an annual capacity of 1.5 million tons.

13.1.1.5 Port's storage facilities

Total storage capacity of the port of Reni is 204900 m2

Which includes storage capacity for liquid cargos - 100000 m3 and storage capacity for 250 containers.

Ro-Ro terminal has an adjoining outdoor parking area of 19150 m2 and

guarded parking lot for cars with an area of 12,000 m2

13.1.2 Port of Izmail

State Enterprise "Izmail Commercial Sea Port" (hereinafter - SE "IZM MTP") is a diversified enterprise that handles a wide range of bulk cargo (iron ore, coal, construction and other bulk cargo) and general cargo (rolled metal, cargo in packages, big -runs and containers). The capacities of the enterprise allow to process up to 8.5 million tons of cargo per year and accept for cargo operations vessels with a draft of up to 7 m, a length of 150 m and a width of up to 30 m. Danube river.

Figure 88: Deep Water Fairway (DWF) Danube – Black Sea

The seaport of Izmail is an important transport hub in Ukraine, which closely links sea, river, rail and motor roads. The optimal route from the Danube European countries to the Caucasus, Iran, the short route of delivery of goods from Turkey, Greece to the Baltic countries, Russia, Scandinavia passes through the port of Izmail. Izmail is located on the map of three international transport corridors: Danube Pan-European corridor No 7 and No9, and the international highway E-87 as well as the international cooperation programs TRACEKA and the trans European transport network TEN-T, see fig. 89.

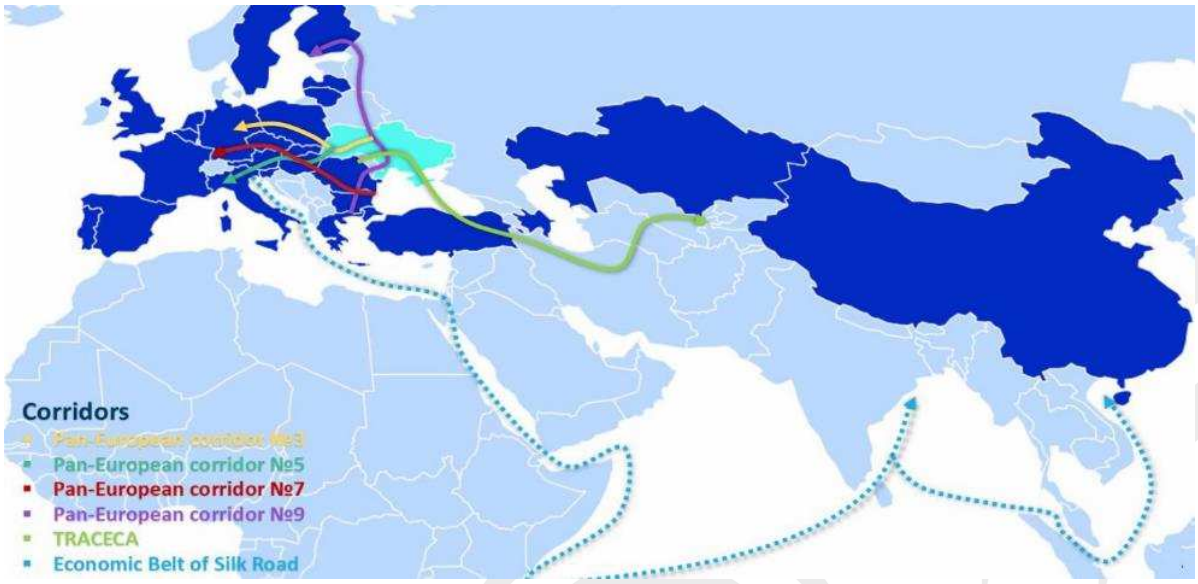

Figure 89: International transport corridors of relevance for Ukraine

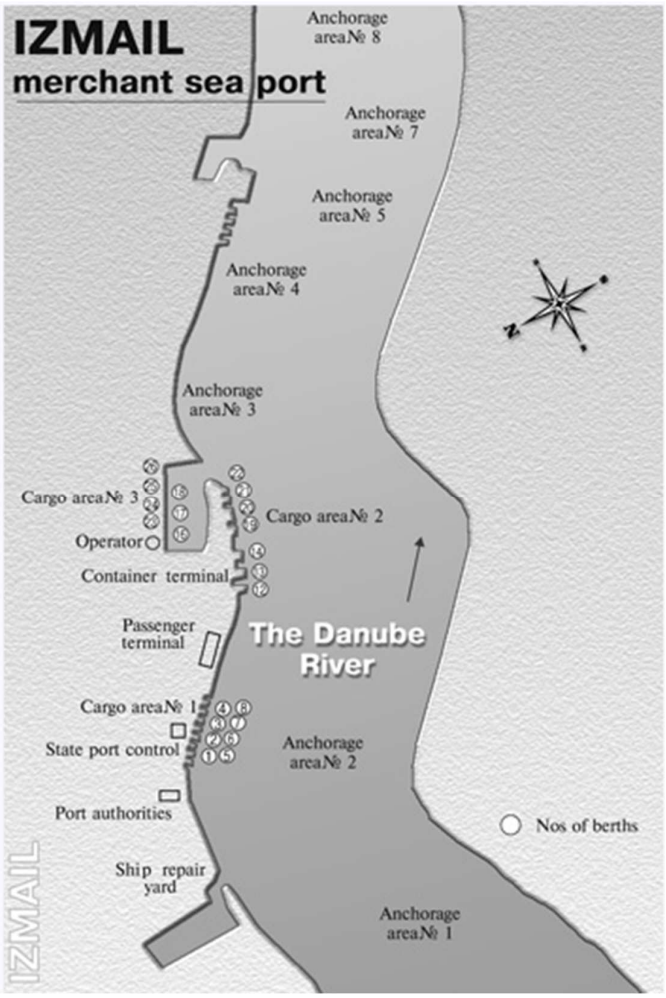

Figure 90: Port of Izmail scheme

In the port is possible: bunker ships with liquid fuel and water; replenish stocks of provisions; get material and technical supplies; repair the hull and mechanisms, as well as docking.

The Izmail seaport has the capacity to carry out cargo operations, including dangerous cargoes of Classes 3, 4.3, 5.2, 7, 9 of IMO hazards, fumigation, boarding and disembarkation of passengers, replenishment of food, sewage and oil intake, all categories of garbage, as well as the repair of equipment and diving inspection of ships.

SE "IZM MTP" has its own port fleet, which includes tugs, boats, floating cranes, non-self-propelled dry-cargo barges, bunkering vessels. In the structure of the SE "IZM MTP" there are three Cargo areas – see fig.90, each of which has its own distinctive features.

Cargo operations in the port are carried out around the clock, seven days a week, all year round.

13.1.2.1 Position

The port of Izmail (44 ° 2'N, 28 ° 5'E) is located on the left bank of the Kiliysky mouth of the river. Danube within the boundaries of 84.6-85.6 and 90.0-94.0 km from the entrance to the deep-water navigation channel from the Black Sea, see Fig. 1 - 3, and towards the territory of the city by 500 m. The water area of the port includes the water area of the Kiliya arm from 82nd to 96th km of the left bank to the conditional border along the channel of the river.

Overview of basic port's features are given in the below table.

Parameters	Explanation / Value
Port land owner (State, Region, Municipality, Private, Other)	State
Port authority name	Izmail branch of USPA
Number of operators (concessionaires, lessors)	6
Total port area (ha)	81,99
Maximum draught (m) - natural or dredged	7
Total number of terminals	3
Heavy lift and out-of-gauge handling capacity (Yes/No)	Yes
Ability to handle full block train along the quay (Yes/No)	Yes
Ability to handle full block train in the port area (Yes/No)	Yes
Transhipment equipment for intermodal transport (Yes/No)	No
Total quay length (vertical + sloped) (m)	4086
Vertical quay length (m)	2619
Sloped quay length (m)	1467
Undeveloped quay length (m)	-
Max number of vessels handled at the same time	25
Max capacity of anchorage or waiting area for barges (number)	Up to 40
Storage capacity (m2)	233 000 m²

Parameters	Explanation / Value
Storage capacity for liquid cargos (m3)	-
Storage capacity (TEU)	816
Storage capacity (CEU - car equivalent unit, for Ro-Ro terminals)	-
Bunkering facilities within the port area (Yes/No)	No
Shore-side power supply for vessels (Yes/No)	Yes
Road connection (Yes/No)	Yes
Rail connection (Yes/No)	Yes
Number of quay cranes of lifting capacity Q < 10 tons	12
Number of quay cranes of lifting capacity 10 < Q < 16 tons	13
Number of quay cranes of lifting capacity 16 < Q < 50 tons	8
Number of quay cranes of lifting capacity Q > 50 tons	-
Total number of quay cranes	33

Table 78: Basic features of the Port of Izmail

13.1.2.2 Ownership, administration (governance) and operation

The total area of the Izmail seaport is 81.99 hectares, and belongs to the State Enterprise "Izmail Commercial Sea Port", the founder of which is Ukraine, represented by the Ministry of Infrastructure of Ukraine, with the exception of 40.2 hectares legally registered for the Izmail branch of the State Enterprise USPA. Administrative and economic activities in the Izmail seaport are carried out by the State Enterprise "Administration of the seaports of Ukraine".

There are six enterprises operating in the seaport of Izmail. Four of them are port operators. The main specialization is stevedoring companies.

The state intends to withdraw from the stevedoring activity in the Izmail seaport in the medium term, by transferring the property complex of the Izmail seaport state enterprise to concession, lease or privatization.

13.1.2.3 Hinterland connections

Izmail is a large transport junction see where sea, river, railway, road routes converge, and is located at the junction of the borders of Ukraine, Romania and Moldova and at the intersection of Pan-European transport corridors VII and IX, see fig. 89.

The seaport is served by one railway station with three railway entrances and communicates with the Izmail - Odessa railway. The port is adjoined by highways leading to the international highway M-15 Odessa-Reni-Bucharest. Motorway M-15 Odessa - Izmail - Reni - Bucharest is in good technical condition and requires only routine maintenance. The E-58 highway passes through Ukraine, around the Black Sea and further to Russia (figure 93). There is a railway connection Izmail-Odessa (figure 89).

13.1.2.4 Port infrastructure

The seaport of Izmail has 24 berths and 5 coastal areas with an adjacent territory for storing cargo at 85 km of the Danube River. Depths at berths range from 0.4 to 7.5 meters. The main cargo flow of the Izmail seaport is export and transit of bulk cargo (coal, ore cargo), bulk (grain and food) and bulk (oil products, gases).

Port infrastructure. The total length of berths in the port is 3860.25 m. The berths are located along the left bank of the river Danube, as well as in the backwater of the port. Three cargo areas of the port specialize in transshipment of general cargo, containers and bulk cargo.

Utilities infrastructure (electricity, water) as part of the ports infrastructure belongs to the SE "IZM MTP" and the SE USPA. The technical condition of the electrical wiring, equipment and facilities corresponds to their service life. All devices are in working order, properly handled, maintained and used in accordance with manufacturers` recommendations, standards and relevant legislation.

Crane equipment. The port berths are equipped with handling equipment: gantry cranes: Albatros, lifting capacity -10t, Sokol, lifting capacity 16-20t, Kondor, lifting capacity 32-40t, floating cranes with lifting capacity up to 100 t, a container reloader with a lifting capacity 40t, auto and electric loaders of various carrying capacities, etc. For auxiliary operations - tractors, bulldozers, cranes other equipment. There is a special container complex.

Currently, the possibility of transferring to the concession of the State Enterprise “Izmail Commercial Sea Port”, which is now engaged in stevedoring activities, is being considered. The investment proposals of SE USPA are presented on the website - http://investinports.com .

13.1.2.5 Port’s storage facilities

The open storage area of SE "IZM MTP" is 20,100 m². The total area of covered cargo warehouses is about 25,200 m². The covered warehouse of the port consists of 8 multi-purpose warehouses located in the rear zone of cargo berths No. 1, 4-8 of the port's Cargo area-1 and berths No. 25-26 of the port's Cargo area-3 (figure 90).

13.2 Railways of relevance for IWT

This section does not refer to the railways which are physically connecting the port gate with the rest of the railway network as they are assessed in deliverable D.T2.2.1, but to the major and important railway sections of different corridors passing close enough to the ports analyzed in previous section to have an impact to those ports.

Port of Izmail is connected with Odessa – Izmail railroad, see fig. 91.

Port of Reni connected with 2 rail roads: to Giurgiulesti (Moldova)-Galates (Romania) which provides mostly export ore from port of Reni to Arcelor Mittal plant in Galati (Romania); and to Etulia (Moldova)which provides mostly freight transit traffic to port of Reni, see fig. 91, 92.

Figure 91: Scheme of railway roads

13.2.1 Railway section Odesa – Izmail

The total length of the railway from Odessa to Izmail - 287 kilometers, makes it technically possible to provide an average route speed, taking into account stops and restrictions, not less than 70 km/h.

From Odessa to Belgorod-Dnestrovsky the track is electrified, then to Izmail the trains are driven by diesel locomotives assigned to the locomotive depot at the Odessa-

Sortirovochnaya station, with undergoing maintenance in the turnaround depot at Artsyz station.

Station Artsyz, see fig.91, currently - a junction on the line towards Izmail. There is a revolving locomotive depot, where mainline and shunting diesel locomotives are based, serving an almost 200-kilometer section of the non-electrified railway from Belgorod-Dnestrovsky to Izmail with a dead-end branch to Berezino.

The locomotive depot serves all diesel locomotives operating on the non-electrified section between Belgorod-Dnestrovsky and Izmail. This is about 10-12 mainline diesel locomotives and about 15 of shunting ones.

In Soviet times, freight trains went through the Artsiz station towards the ports of Izmail and Reni, now it is mainly intermediate in the direction of cargo transportation towards the port of Izmail.

In 1997, a section of the railway between Besarabka and Berezino was dismantled, the volume of traffic dropped sharply and the local locomotive depot became only "turnover". Currently, the station is served by only one passenger train - "Kiev - Izmail". The restoration of the railway to Besarabka will open up a number of economic and geopolitical advantages for Ukraine and Moldova.

In fig.91 marked the disassembled line between Berezino and Besarabka, which is supposed to be restored.

Main cargoes delivered by railroad: iron ore, metal products, liquefied gas, oil, sunflower meal, granulated, agricultural products (grain group), petroleum products, edible salt, mineral fertilizers.

Section	Parameter	Value	Unit	Reference in Regulation 1315/2013
Odesa - Izmail	Length	287	km	n/a
	Electrification	30	% of km	§12 except for isolated networks
	Track gauge 1520mm	287	% of km	§13 as priority for RR infrastructure development
	Line speed >= 100km/h	-	% of km	§39 requirement for core network
	Axle load (>=22.5t)	-	% of km	
	Train length (740m)	-	% of km	

Table 79: Odesa - Izmail railway section parameters

13.2.2 Railway section Reni – Galati

Ukraine has an isolated section of the railway near the port of Reni and the Bolgrad station - on the highway from the Moldavian station Besarabka to the Romanian Galati.

Figure 92: Reni rail and road connections

After the disassemble in 1997 the section of road between Artsyz and Bessarabskaya, connecting Odessa, Ilyichevsk, Belgorod-Dnestrovsky with the port of Reni, freight rail traffic stopped.

In 1999, sections of the railroad in Ukraine at Reni and Bolgrad station were transferred to JSC “Ukrzaliznytsia” and isolated from the rest of the Ukrainian rail network on the moment.

Now the increase in tariffs, including those for transit through the Moldovan section of the railway, has led to the fact that only two or three freight trains are supplied to the Reni station per day from the Bessarabskaya side. And only one train per day is formed for the Romanian Galati, in the amount of 35-40 wagons.

The railway supply to the ports of Giurzhdulesti and Cahul goes either by the railway of Moldova in Cahul, or in transit through the Ukrainian section of the railway in Reni along the main highway Besarabka - Reni - Galati. There is also a certain volume of transit cargo to Romania.

The combined track between Galati and Giurgiulesti with a track width of 1435 mm is not used, trains run along the track of 1520 mm.

A railroad track with Ukrainian standard width - 1520 mm, enters the Romanian city of Galati, reaching the metallurgical plant Arcelor Mital.

Main cargoes delivered by railroad: iron ore, petroleum products, agricultural products (grain group).

Section	Parameter	Value	Unit	Reference in Regulation 1315/2013
Reni- Galati	Length	35	km	n/a
	Electrification	-	% of km	§12 except for isolated networks
	Track gauge 1520mm	100	% of km	§13 as priority for RR infrastructure development
	Line speed >= 100km/h	-	% of km	§39 requirement for core network
	Axle load (>=22.5t)	100	% of km	
	Train length (740m)	-	% of km	

Table 80: Reni- Galati railway section parameters

13.2.3 Railway section Reni – Etulia

Reni- Etulia rail road is a Ukrainian part of railroad connected to Moldavian railways. It provides freight traffic of Reni sea port see fig.92.

Main cargoes delivered by railroad (mostly transit cargoes through Moldova to Reni port): iron ore, fertilizers, agricultural products (grain group).

Section	Parameter	Value	Unit	Reference in Regulation 1315/2013
Reni-Etulia	Length	26.1	km	n/a
	Electrification	0	% of km	§12 except for isolated networks
	Track gauge 1435mm	0	% of km	§13 as priority for RR infrastructure development
	Line speed >= 100km/h	0	% of km	§39 requirement for core network
	Axle load (>=22.5t)	100	% of km	
	Train length (740m)	100	% of km	

Table 81: Reni-Etulia railway section parameters

13.3 Roads of relevance for IWT

This section does not refer to the roads which are physically connecting the port gate with the rest of the road network as they are assessed in deliverable D.T2.2.1, but to the major and important road sections of different corridors passing close enough to the ports analysed in previous section to have an impact to those ports.

The major road of Ukrainian part of Danube river is M-15 Odessa-Izmail- Reni road (to Bucharest, fig. 93, 94). It coincides with part of the European route E87 (Odessa - Constanta - Izmir - Antalya), part of the European corridor "Black Sea Economic Community".

M-15 highway passes along the fence of Reni port, about 2km from the port of Izmail and from Ukrainian terminal of Orlovka – Isaccea international ferry crossing.

Figure 93: Highway M-15 Odesa – Reni (Bucharest)

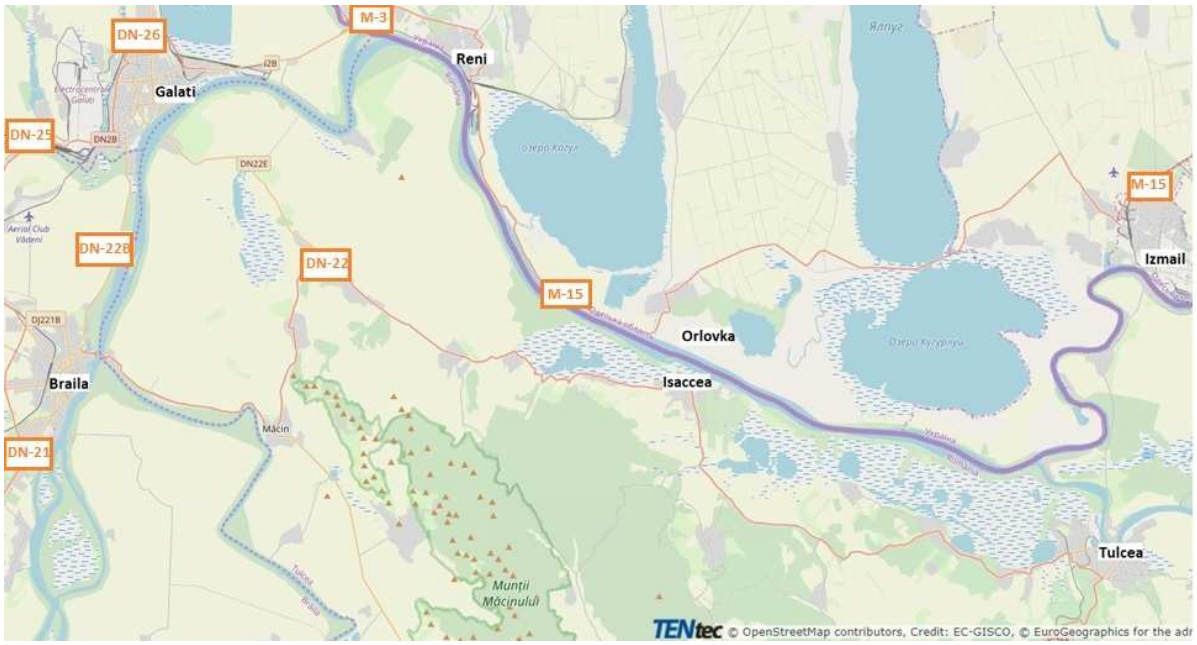

Figure 94: Roads in the area of Reni and Izmail ports

13.3.1 Road section Odesa – Izmail – Reni

The M-15 highway has a strategic importance for the economic development of the South of Ukraine, it connects 5 ports on the Black Sea and serves as a transport corridor for heavy duty trucks heading to the Giurgiulesti international border crossing point. The almost 80 kilometers long of M- 15 highway was restored during 2016-2018.

M-15 highway Odessa - Reni located in the Odessa region (partially passes through the village of Palanca in the Republic of Moldova).

Highway begins in Odessa, passes through the village Palanka in Moldova (but the road is owned by Ukraine), Monashi, Sarata, Tatarbunary, Izmail Reni (former highway P33) and ends at the Reni checkpoint, which leads to Constanta in Romania.

The length of the Odessa - Reni (Bucharest) highway - 289.4 km.

Category / Section	Parameter	Value	Unit
Motorway M-15 / Odesa - Reni	Length	289.4	km
	Number of lanes (total, in both directions)	4	lanes
	Maximum speed allowed	110	km/h
	Axle load for trucks allowed	10	t/axle

Table 82: Odesa- Reni road section parameters

13.4 Multimodal terminals outside of ports

Multimodal terminals within ports are analyzed in deliverable D.T2.1.1: "Multimodal facilities and services". Therefore, this section in this report will tackle multimodal terminals close to, but outside of ports, which can have an impact on the throughput of a nearby port or even its development plans.

13.4.1 Multimodal terminal Orlovka – Isaksea ferry crossing

The Orlovka ferry complex (figures 95, 96) is located on the left bank of the Danube, 4 km from Orlovka town, Reni district (22km from Reni), Odessa region, 2 km from the international highway M-15 (E 87), 40 km from Izmail. Located on an area of about 6 hectares, and has a unique in the Ukrainian part of the Danube, a universal berth structure for all types of river ferries and sea and river vessels.

Figure 95: Ferry crossing "Orlovka-Isakcha"

Ferry "Orlovka-Isakcha" is a public-private partnership project, built by private investors and opened by the order of the Cabinet of Ministers of Ukraine No. 229-r dated 04/10/2019. The ferry has an international checkpoint across the state border for ferry, passenger and freight traffic between the settlements Orlovka (Ukraine) - Isaccea (Romania) with a capacity of about 200 units of trucks, 500 units of light transport and a passenger traffic of about 1500 people. Additionally, four ferries will operate here for passengers without a car. The distance between the Ukrainian and Romanian banks of the Danube in the Orlovka area is about 900 meters and will be covered by a ferry in 10 - 15 minutes.

Ferry crossing "Orlovka-Isakcha" is planned to start working after the end of Covid quarantine.

Figure 96: Ferry crossing "Orlovka-Isakcha", view from the left (Ukrainian) side of Danube

Terminal infrastructure characteristics	Value	Unit/ Description	Notes
Total area	60000	(m^2)	
Handling capacity	200/ 500/ 1500	Units/day	Trucks Light transport people
Storage area	9000	(m^2)	
Depot (base) storage capacity	120	TEU	
Capacity to handle block-trains	No	(Yes/No)	
Maximum length of complete block-train	-	(m)	
Number of rail sidings for loading/unloading	-	(n)	
Total length of rail sidings for loading/unloading	-	(m)	

Terminal infrastructure characteristics	Value	Unit/ Description	Notes
Electrified train accessibility	No	(Yes/No)	
Number of road lanes for truck traffic	2	(n)	
Number of road lanes for truck loading/unloading	2	(n)	
Parking space for trucks / semitrailers	60	(n)	

Table 83: Ferry crossing "Orlovka-Isakcha" parameters

14 Conclusions

Transport infrastructure is a fundamental part of contemporary social and economic infrastructure. It enables generation of economic wealth in all Danube region countries and allows the import and export of goods and services to and from the region. Moreover, it ensures smooth mobility of people and is fundamental to the production and distribution of goods. High quality and efficient transport infrastructure is a crucial precondition for efficient supply chains.

While transport infrastructure brings important economic and strategic benefits, its provision comes at a price. Infrastructure managers and supranational organizations (e.g. European Union) face difficult challenges in terms of infrastructure provision and maintenance. Occasionally, the lack of funds or political issues create various inadequacies in transport infrastructure, such as creation of bottlenecks and missing links, needs for capital maintenance due to poorly maintained infrastructure and its heavy wear and tear, or its rehabilitation and modernization. Coping with these issues is by no means an easy task. It calls for an action on the part of the governments concerned, and especially actions that stretch beyond national borders.

In order to set the scene for future infrastructure investments, a thorough analysis of the current status quo of existing transport infrastructure of relevance for inland waterway transportation in the Danube region. This report demonstrated that the status quo of transport infrastructure in the nine countries of the Danube region is, in general, in average to good condition. Quite logically, there is a greatest possible variety of technical conditions of different port assets and rail and road infrastructure even within each country, whereas the diversity of conditions is even more notable when all analysed countries are assessed together.

However, in many cases the existing infrastructure continues to evolve, with investment by transport infrastructure managers to accommodate changing demand, changing vessel and vehicle types, and to improve the overall transport network performance. This will be demonstrated through an assessment of on-going and planned projects in Deliverable D.T1.1.3 Report on on-going and planned projects in the Danube Region (for selected sections and nodes).

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Annexes

Annex I

Port characteristics

Ports from Enns to Bačka Palanka

PORTS	Enns	Vienna	Bratislava	Komarno	Budapest	Dunaújváros	Baja	Vukovar	Bogojevo	Bačka Palanka
Infrastructure assets										
Port land owner (State, Region, Municipality, Private, Other)	region+ private	City of Vienna – Wien Holding – Hafen Wien GmbH	state-owned joint stock company	state-owned joint stock company	state-owned MAHART Freeport Plc.	Private	State	State owned/Privately owned	State owned	State owned
Port authority name	Ennshafen OÖ GmbH (+NÖ GmbH)	Hafen Wien GmbH	Verejné prístavy, a.s. / Public ports, JSC	Verejné prístavy, a.s. / Public ports, JSC	Freeport of Budapest Logistics Ltd.	ISD Dunaferr Dunai Vasmű Zrt	Baja Public Port Ltd.	Port Authority Vukovar	Port Governance Agency	Port Governance Agency
Number of operators (concessionaires, lessors)	10	3	1	1	7	2	5	4	1	1
Total port area (ha)	352	350	156.68	20.12	152	5.2	20.8	approx. 26 ha	9.05	74.17
Maximum draught (m) - natural or dredged	2,7 m (guaranteed /RNW)	2.7	5.0	7.0	2.5	3 Dredged		2.6	4 m	4 m
Total number of terminals	8	3	10	2	18	6	9	7	1	1
Heavy lift and out-of-gauge handling capacity (Yes/No)	Yes	Yes	YES	NO	Yes	Yes	Yes	YES	NO	NO
Ability to handle full block train along the quay (Yes/No)	Yes	Yes	YES	YES	Yes	Yes	Yes	NO	NO	NO
Ability to handle full block train in the port area (Yes/No)	Yes	Yes	YES	YES	Yes	YEs	Yes	NO	NO	NO
Transhipment equipment for intermodal transport (Yes/No)	Yes	Yes	YES	YES	Yes	Yes	Yes	YES	N/A	N/A
Total quay length (vertical + sloped) (m)	2780	18000	8,455	5445	4850	563	1380	1700	210	322
Vertical quay length (m)	2780	10500	3,138	1,112	1650	563	757	260	90	322
Sloped quay length (m)	0	7600	5,317	4,333	3200	0	623	1,000	120	0

PORTS	Enns	Vienna	Bratislava	Komarno	Budapest	Dunaújváros	Baja	Vukovar	Bogojevo	Bačka Palanka
Undeveloped quay length (m)	1,900	0	750	0	1000	0	0	400	0	0
Max number of vessels handled at the same time	16	11	No data available	No data available	18	6	8	7	2	3
Max capacity of anchorage or waiting area for barges (number)	34	71	84	50	24	20	8	No data available	6	12
Storage capacity (m2)	n.a.	200000 open + 70000 covered	101125	32730	141920	1600	12080 covered + 80000 open	13000	silo of 30,000 tons and a closed space place of 10000 m2	650 covered and 8.260 open
Storage capacity for liquid cargos (m3)	3000 (LPG) + 6000 (biodiesels+ biooils)	No data available	0	0	n/a	0	0	10000	N/A	N/A
Storage capacity (TEU)	10000	8000	No data available	6500	80000	0	400	N/A	N/A	N/A
Storage capacity (CEU - car equivalent unit, for Ro-Ro terminals)	600	10000	No data available	No data available	500	0	120	N/A	N/A	N/A
Bunkering facilities within the port area (Yes/No)	Yes	No data available	Yes	Yes	Yes	No	no	YES	NO	NO
Shore-side power supply for vessels (Yes/No)	Yes	No	YES	YES	Yes	Yes	Yes	Yes	YES	YES
Road conneection (Yes/No)	Yes	Yes	YES	YES	Yes	Yes	Yes	Yes	YES	YES
Rail connection (Yes/No)	Yes	Yes	YES	YES	Yes	Yes	Yes	Yes	NO	NO
Number of quay cranes of lifting capacity Q < 10 tons	6	1	12	0	3	3	0			2
Number of quay cranes of lifting capacity 10 < Q < 16 tons	3	3	7	0	2	2	0		1	1
Number of quay cranes of lifting capacity 16 < Q < 50 tons	8	1	9	8	2	2	1			
Number of quay cranes of lifting capacity Q > 50 tons	0	n.a.	2	0	0	0	0			

PORTS	Enns	Vienna	Bratislava	Komarno	Budapest	Dunaújváros	Baja	Vukovar	Bogojevo	Bačka Palanka
Total number of quay cranes	17	n.a.	30	8	8	7	1			

Ports from Prahovo to Izmail

PORTS	Prahovo	Lom	Ruse	Drobeta TS	Giurgiu	Galati	Constanta	Giurgiulesti	Reni	Izmail
Infrastructure assets										
Port land owner (State, Region, Municipality, Private, Other)	State owned	State	State	State	State	State	State	State	State	State
Port authority name	Port Governance Agency	EA Maritime Administration, BPICo	EA Maritime Administration, BPICo	N.C. Administration of Danube River Ports J.S.Co. Giurgiu	N.C. Administration of Danube River Ports J.S.Co. Giurgiu	CN APDM SA GALATI (National Company Maritime Danube Ports Administration Galati)	N.C. Maritime Ports Administration J.S.Co. Constanta	Giurgiulesti International Free Port	Reni branch of USPA	Izmail branch of USPA
Number of operators (concessionaires, lessors)	2	1	5	3	3	8	37	Danube Logistics	11	6
Total port area (ha)	6.76	38.34	131.20	13.90	219.54	86 ha 4131 sqm	1313	120	94.36	81.99
Maximum draught (m) - natural or dredged	4 m	2,50 dredged	2,50 dredged	2.5	3.5	7.32 m	17.5	7.0	12.0	7.0
Total number of terminals	2	1	6	3	8	4	21	4	37	3
Heavy lift and out-of-gauge handling capacity (Yes/No)	NO	Yes	Yes	No	No	YES	Yes	Yes	Yes	Yes
Ability to handle full block train along the quay (Yes/No)	YES	Yes	Yes	No	No	YES	Yes	No	Yes	Yes
Ability to handle full block train in the port area (Yes/No)	YES	Yes	Yes	No	No	YES	Yes	Yes	Yes	Yes
Transhipment equipment for intermodal transport (Yes/No)	YES	No	Yes	No	Yes	YES	Yes	Yes	Yes	No
Total quay length (vertical + sloped) (m)	560	1424	4492	1156	2120	7,065	29830	780	3636	4086
Vertical quay length (m)	320	970	1075	365	170	4,675	29,830	780	2,876	2,619
Sloped quay length (m)	240	454	3,417	791	1,950	2,390	0	0	1,060	1,467

PORTS	Prahovo	Lom	Ruse	Drobeta TS	Giurgiu	Galati	Constanta	Giurgiulesti	Reni	Izmail
Undeveloped quay length (m)	0		500	1,250	850	620	3,262	220	800	0
Max number of vessels handled at the same time	6	13	37	3	8	2	96	4	11	25
Max capacity of anchorage or waiting area for barges (number)	60	5 anchorages	19 anchorages	20	35	2	150	2	42	40
Storage capacity (m2)	8000 open space	131,626	286,075	13725	40000	504,465	3898325	20000	204900	233000
Storage capacity for liquid cargos (m3)	N/A	188	0	N/A	7000	1,323,200 TO	1700000	63600	100000	0
Storage capacity (TEU)	N/A	1000	15000	N/A	N/A		16000	210	250	816
Storage capacity (CEU - car equivalent unit, for Ro-Ro terminals)	N/A	n/a	160	N/A	N/A	n/a	6600	n/a	120	0
Bunkering facilities within the port area (Yes/No)	YES	Yes	Yes	No	Yes	YES	Yes	Yes	Yes	No
Shore-side power supply for vessels (Yes/No)	YES	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Road conneection (Yes/No)	YES	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Rail connection (Yes/No)	YES	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of quay cranes of lifting capacity Q < 10 tons	3	10	2					0	0	12
Number of quay cranes of lifting capacity 10 < Q < 16 tons	2	8	7					1	25	13
Number of quay cranes of lifting capacity 16 < Q < 50 tons	1	0	4					0	5	8
Number of quay cranes of lifting capacity Q > 50 tons		0	0					1	1	0
Total number of quay cranes		18	13					2	31	33