

**Support to the Government of Moldova
for the Preparation of a Transport and Logistics Strategy**

TECHNICAL REPORT – GIURGIULESTI PORT

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GOVERNMENT OF MOLDOVA
Transport and Logistics Strategy Preparation



Technical Report – Giurgiulesti Port

November 2012

NOTE:

This report covers data collected and processed by the Project Team up to August 2012. The information presented herein has been compiled either from comprehensive research or from data provided by the relevant governmental and private institutions and agencies.



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LIST OF ABBREVIATIONS

AGN	European Agreement on Main Inland Waterways of International Importance
CFM	Moldovan Railway (Calea Ferată din Moldova)
DWT	Deadweight tons
EBRD	European Bank for Reconstruction and Development
EU	European Union
EUR	Euro (currency)
G-FEZ	Giurgiulesti Free Economic Zone
GIFP	Giurgiulesti International Free Port
HGV	Heavy goods vehicle
HP	Horsepower
IPTANA	Design Institute for Road, Naval and Air Transport
MD	Moldova
MoTRI	Ministry of Transport and Roads Infrastructure (Moldova)
N/A	Not available
PAX	passenger(s)
RO	Romania
Ro-Ro	Roll-on/roll-off
SWOT	Strengths, Weaknesses, Opportunities, and Threats
TEU	Twenty-foot equivalent unit
THC	Total Handling Charge
UKR	Ukraine
UNECE	United Nations Economic Commission for Europe
USD	United States dollar (currency)
VAT	Value Added Tax



PART A

1. BACKGROUND

1.1. History of the Port

After the collapse of the Soviet Union, Moldova lost access to the Black Sea through navigable waterways because the Danube was entirely on Ukrainian territory. The mouth of the Prut is situated several hundred meters away from the Ukraine – Moldova border. Similarly, Ukraine lost access by land to the town of Reni, which was only accessible via Moldovan territory. According to an agreement reached in 1998, Ukraine gave up a 430 meters strip of land near the village of Giurgiulesti and 150 hectares of land next to Basarabeasca railway station. According to the same agreement, Moldova gave Ukraine control over a 7.7 km stretch (near Palanca) of secondary road linking Izmail to Reni.

The development of the petrol terminal at Giurgiulesti port was initiated in 1996. However, the project was not completed by the initial investor, and only 50% of the works were finished. In 2006 the current investor took over the port operations.

The Government of Moldova supports the development of Giurgiulesti Port mainly because the port has the following functions:

- Moldova's access to the sea
- The basis for independence of political interests of neighboring countries;
- The strategic reserve for important cargo transshipment, e.g. oil and coal (independent of commercial aspects);
- A by-pass for Transnistria;
- A competitor to other ports on Danube (Galati, Reni) and to other transport chains and modes, implying opportunities to influence the price.

The current port operator as well as the Government of Moldova has committed substantial resources in recent years to the development of the port as well as of its hinterland connections by rail and road.

1.2. Scope of Port Study

The objective of this study is to provide a detailed picture of the role of Giurgiulesti Port for the general logistics situation in Moldova. This port constitutes Moldova's only direct access to the Danube river and thus to international sea trade. With this unique position, Giurgiulesti Port has the potential to provide important advantages regarding trade from and to Moldova. In order to determine the demand for different investments ranked by priority and effectiveness this study will provide answers to the following main questions:

Does a former demand-analysis and development strategy exist for Giurgiulesti Port?

As described in the later chapter on traffic flows, the handling volumes in the port have increased tremendously between 2007 and 2011. There are two principal reasons for this development. First, the Government has opened Giurgiulesti International Free Port (GIFP) for private operators and private investments. Second, the port operator Danube Logistics itself has made investments into the port infrastructure with a focus on market-oriented development of the port business.



The private investors who made investments into GIFP together with EBRD had a clear vision about the future potential of the port. Therefore Dornier Consulting prepared a Due Diligence Report for Giurgiulesti International Free Port in October 2006. They attested sufficient cargo potential and recommended developing Giurgiulesti as a logistics port in order to exploit the comparative advantages of Giurgiulesti in competition with the neighbor ports. The study included an analysis of transport corridors and suitable commodities as well as a cargo throughput forecast, a business concept and a risk evaluation.

The actual positive development of GIFP was enabled by the decision of the Government to cooperate with private investors and by demand-oriented business development on behalf of Danube Logistics. The whole Giurgiulesti Port Complex provides a sustainable basis for a promising further development.

Can Giurgiulesti port fulfill the function as a “game-changer” for Moldovan logistics trade?

On the one hand, the Consultant states that one single port does not have the potential for a fundamental change of the logistics situation for the whole country. First of all, the traffic flows depend on the points of origin and destination. It is a fact that the freight flows are directed via the most suitable way depending on the characteristics of different transport modes, price levels, capacities and service levels. Finally, in most cases the shortest possible transport route is chosen even if it involves additional formalities at border crossings.

On the other hand, the free choice of transport routes is a chance for Giurgiulesti Port Complex. If the profitability of the whole supply chain will be competitive, certain changes in the transport patterns can be realized. The detailed volume forecast will be analyzed in Chapter 6 of this port report.

Giurgiulesti Port Complex is not classified as a “game-changer” for Moldova’s foreign trade. One reason described above is that transport flows can always be shifted to other ports and other modes. Another reason is the share of the port handling volume in relation to Moldovan import/export and transit volume in total. In 2010 Giurgiulesti Port Complex handled 474,000 t (source: statistical data of Port Captain). In the same period the total volume of import/export and transit for Moldova amounted to 5.1 mln t (based on EU statistics in chapter 2 of report A2 - Traffic Forecast). This represents a share lower than 10% for Giurgiulesti Port Complex. Even if the forecasted growth of port handling volumes will occur, the share itself is not expected to increase significantly.

Although Giurgiulesti Port Complex will not fulfill the full function as a “game-changer” it can become a highly important success factor that may facilitate imports, exports and transit flows for Moldova. The main reason therefore is the specific competitive advantage that Moldova can participate directly in global trade via Giurgiulesti Port Complex. Compared to the other landside border crossing points, the number of to be passed borders is for many destinations much lower by using Giurgiulesti Port Complex.

Furthermore a highly effective port will incentivize the logistics performance. It will provide attractive conditions for the settlement of further companies within the Business Park.



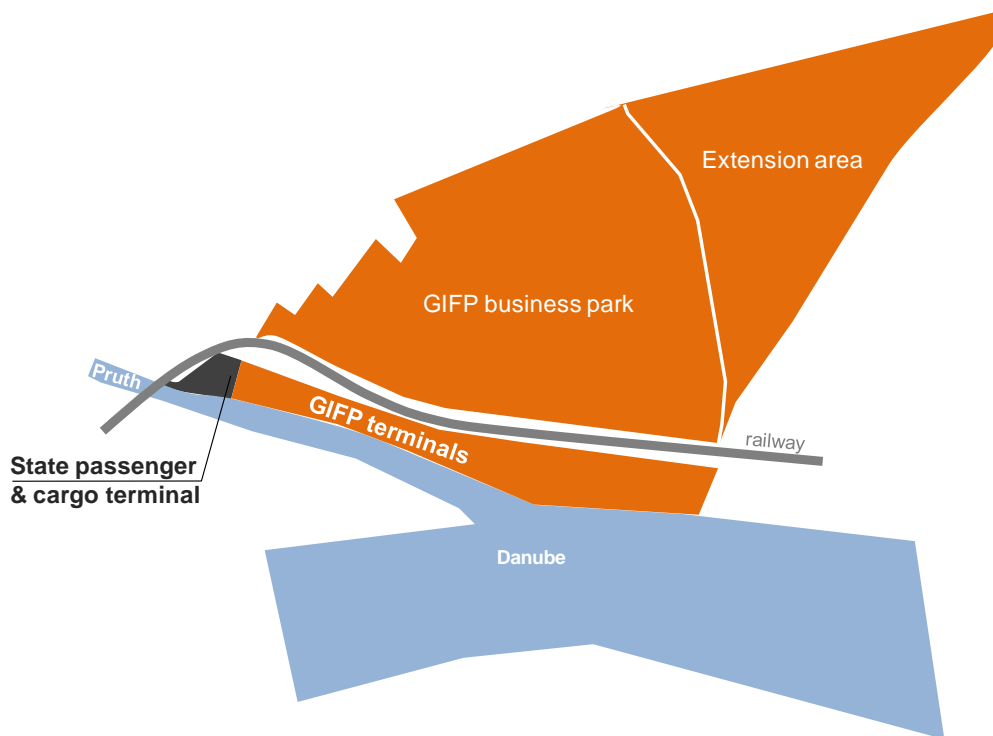
2. ORGANIZATION STRUCTRE AND LEGAL FRAMEWORK

2.1. Location

Giurgiulesti Port is located at the Southern border of Moldova. The whole Giurgiulesti Port Complex is divided into 2 main sections:

- Giurgiulesti International Free Port (GIFP), located on the rivers Danube and Prut, operated by the private investor ICS Danube Logistics SRL;
- Giurgiulesti State Passenger and Cargo Terminal, located on the river Prut, operated by the state company “Fluvial Port Ungheni”.

Figure 2.1. Separation between Private Port Area and State Terminal



Source: Danube Logistics, the Consultant

2.2. Structure of Administrative Set-up

The figure below shows the clear legal separation between the state terminal and GIFP.

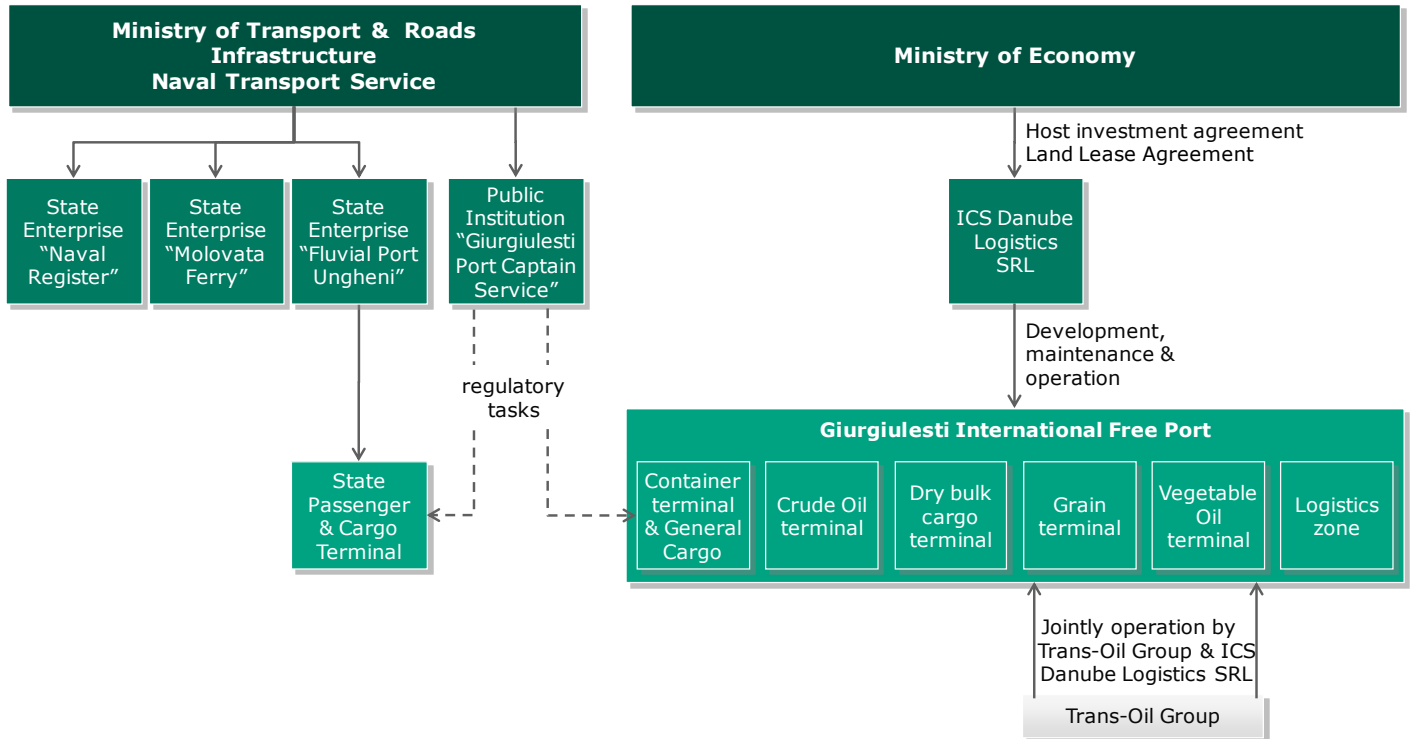
GIFP is operated by the private investor ICS Danube Logistics SRL, who has signed a host investment agreement and a land lease agreement with the Ministry of Economy.

The state passenger and cargo terminal is operated by the state enterprise Fluvial Port Ungheni under the responsibility of the Ministry of Transport and Roads Infrastructure (MoTRI).

The public institution “Harbour Master Giurgiulesti” under the guidance of the Naval Transport Service Department fulfills regulatory tasks for all inland waterways as well as for the arrival and departure of ships at/from Giurgiulesti Port Complex.



Figure 2.2. Organization Structure Naval Sector



Source: the Consultant

2.3. Legal Framework

The strategic importance of Giurgiulesti Port has been recognized. Therefore the Moldovan Government has released a special law (Nr. 8-XV on Giurgiulesti International Free Port from 17th February 2005). Its main purpose is “to accelerate the economic development” of Giurgiulesti port and the South area of Moldova, “to ensure the country’s energy and transport security and to develop international trade” (cf. §1.1).

The aim of the law was to identify a general investor who will lease the entire territory of the International Port and who will “be responsible for the development and maintenance” (§1.11) of the entire infrastructure.

ICS Danube Logistics SRL, a Moldovan limited liability company, became the general investor and operator of Giurgiulesti International Free Port. Danube Logistics’ shareholders are the Dutch company Danube Logistics Holding BV (80%) and the European Bank for Reconstruction and Development (EBRD, 20%).

A series of further incentives included in the law aimed at encouraging the business development within the port are listed below:

Generous treatment of monopole criteria:

“The provisions of legislation on competition and activity of natural monopolies shall not be applied to the activity of the General Investor, except for the actions that can affect competition on commodity markets of the Republic of Moldova” (§ 1.12).



Protection of investments:

“Investments made within Giurgiulesti Port shall be protected by the state (...)” (§ 2.3).

Exemption from port fees:

“(...) the General Investor and their customers are exempted from fees and taxes for the operation and use of port facilities, except for shipping payments (...)” (§ 4).

Exemption from customs duties (except for customs processing fees):

- a) for “goods imported to the International Port from the rest of (...) Moldova”
- b) for “goods imported to the International Port from outside (...) Moldova”
- c) for “goods originating from the International Port, exported to the rest of (...) Moldova”
- d) for “goods, including those originating from International Port, exported outside Moldova as well as to free economic zones of (...) Moldova” (§ 7.4).

Reduced income tax:

“For the first 10 years, the income tax rate is 25% of the established income tax rate, thereafter the income tax rate is 50% of the established income tax rate for 10 years” (cf. § 8.2).

No VAT:

Goods and services imported to the International Port from abroad or the rest of the customs territory of Moldova shall be exempted from value added tax (cf. § 8.6).

Exemption from social security contributions:

“Resident’s employees - foreign and stateless persons are not obliged to pay mandatory social security contributions to the state social insurance budget and mandatory health insurance contributions” (§ 10.2).

“Residents are not obliged to pay mandatory social security contributions to the state social insurance budget and mandatory health insurance contributions for their employed foreign and stateless persons” (§ 10.3).

By the special law for Giurgiulesti International Port, favorable conditions for private investment capital have been provided. Until today, the development in Giurgiulesti port can be regarded as a success story.



3. INFRASTRUCTURE

3.1. State Passenger and Cargo Terminal

The state passenger and cargo terminal was finalized in 2009 by the Moldovan Government in parallel with the establishment of a passenger line to Istanbul. It consists of a passenger terminal building and a berth with an area for loading and unloading. The passenger terminal building also houses the Port Captain office and the Customs authority and seems to be not fully used.

In 2009, about 13 PAX per week were transported between Giurgiulesti and Istanbul using ferry services. After one year of service, there is currently no scheduled passenger transport service. However, passenger and cruise ships occasionally use the existing facilities. Danube cruise operators such as Dunav Tours include Giurgiulesti port as one of their destinations. The touristic potential of the port needs to be further explored.

The terminal is also used for other purposes, e.g. for general cargo or bulk cargo services.

Figure 3.1. State Passenger Terminal Giurgiulesti



Source: the Consultant

3.2. The Giurgiulesti International Free Port (GIFP)

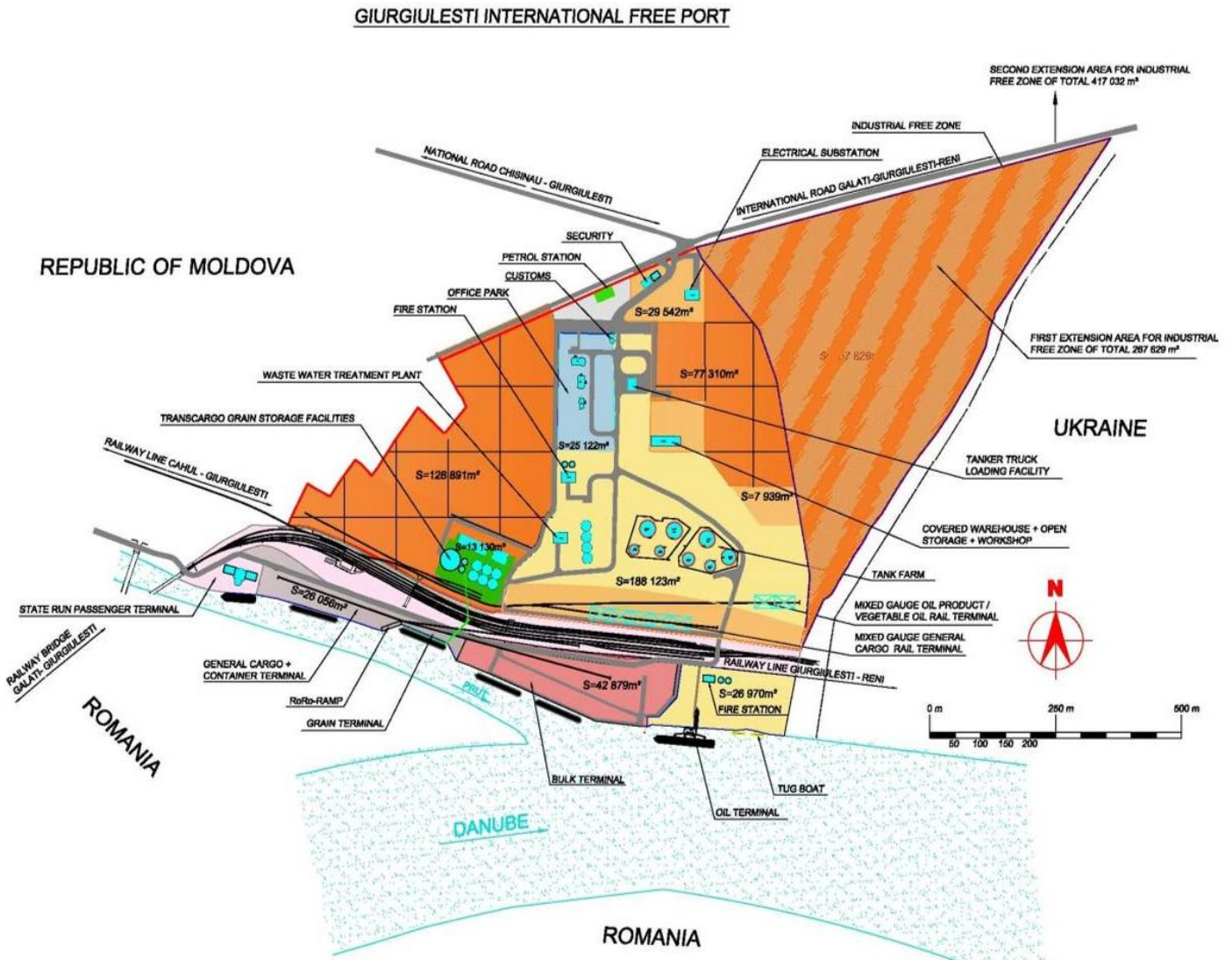
The International Free Port of Giurgiulesti comprises an area of 120 ha (leased for 99 years). The entire territory has a status of a free economic zone until 2030. Danube Logistics currently occupies an area of 55 ha, which is divided into six functional areas:

1. Refined oil terminal
2. Vegetable oil terminal
3. Grain terminal
4. Dry bulk cargo terminal
5. General cargo and container terminal
6. Business park

The expansion area for the business park comprises a total of 65 ha.



Figure 3.2. Port Map



Source: Danube Logistics

3.2.1. Oil Terminal

The refined oil terminal located in the East of the port with a berth depth of seven meters is capable of handling both sea going vessels with up to 12,000 DWT and river barges.

In addition, the terminal consists of eight tanks with a total storage capacity of 63,600 cubic meters (each with a capacity ranging from 4,200 to 12,600 cubic meters) and a truck loading facility. A mixed gauge rail terminal is currently under construction.

The annual transshipment capacity of the oil terminal exceeds 1 million tons.



Figure 3.3. Refined oil Terminal



Source: Danube Logistics

3.2.2. Vegetable Oil Terminal

In November 2011 the vegetable oil loading terminal facility has been finished and started operation. The storage capacity is 6,000 tons. The vegetable oil terminal provides a berth depth of seven meters. This terminal is dedicated to exports.

Figure 3.4. Vegetable Oil Terminal



Source: Danube Logistics

3.2.3. Grain Terminal

In 2009 the grain terminal has been installed by Trans Cargo, a subsidiary company of the Trans Oil Group. The terminal consists of a berth with a depth of five meters, which offers the possibility to load maritime vessels with a capacity up to 7,000 metric tons, with a loading rate of 300 metric tons per hour. The terminal can receive up to 3,000 metric tons of grain per day (by rail and by road).



Figure 3.5. Grain Terminal



Source: Danube Logistics

The total storage capacity comprises 50,000 metric tons of cereals while the transshipment capacity amounts to 250,000 tons per annum.

3.2.4. Dry Bulk Cargo Terminal

The terminal, which is suitable for handling typical bulk cargo, occupies around 300 meters of the river bank with a minimum depth of five meters. An open storage area of about 4 ha and a floating crane with a capacity of 16 tons are already available. Danube Logistics is currently in negotiation with Lafarge regarding a transshipment and storage agreement. A handling volume of 150,000 tons is expected in 2012.

Figure 3.6. Dry Bulk Cargo Terminal



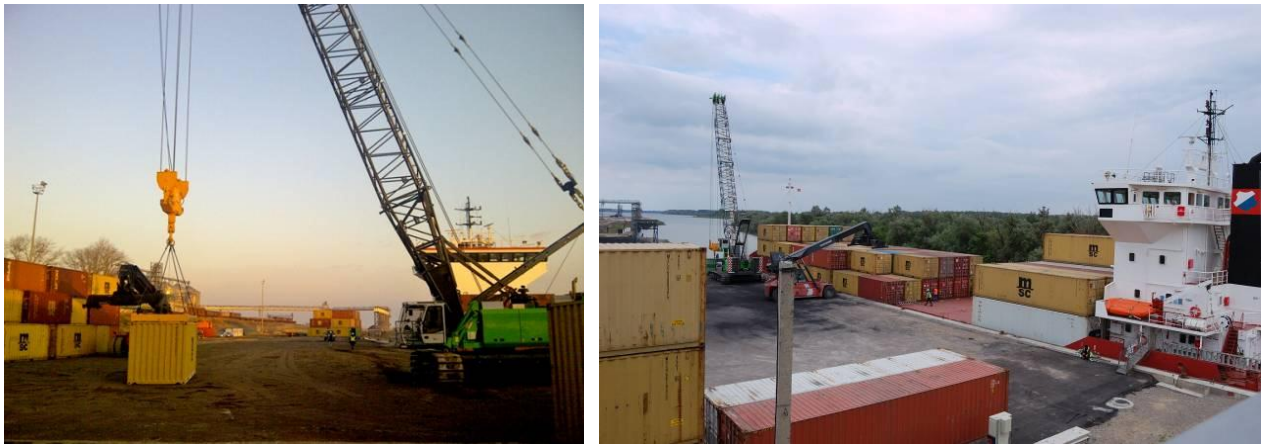
Source: ICS Danube Logistics SRL



3.2.5. General Cargo and Container Terminal

At the end of 2011, Danube Logistics finalized the construction of a container terminal, which consists of a quay wall of 160 meters. The berth with a depth of five meters can be used by river barges and small maritime vessels. The tri-modal transport infrastructure offers road access as well as wide and normal gauge railway access. The total storage capacity is about 500 TEU and 48 additional reefer plugs. One mobile crane, one reach stacker and two forklifts handle the containers within the port.

Figure 3.7. General Cargo and Container Terminal



Source: the Consultant

3.2.6. Business Park

The Industrial Free Zone within GIFP provides areas for national and international investors. It is suitable for logistics providers, for industries with a high affinity to logistics sector and for production of semi-finished and final products. Besides the existing area, there is an expansion area of 65 ha.

Figure 3.8. G-FEZ Master Plan Business Park



Source: ICS Danube Logistics SRL



3.2.7. Future Development Projects GIFP

There are several projects aimed at further supporting the positive development of the port into a major logistic center. The following further installations are either already under construction or in the planning phase:

- Mixed Gauge Rail Terminal: The rail terminal will offer the possibility to handle oil products as well as dry cargo. The estimated transshipment volume of oil products is 300,000 tons per year. About half of this amount will be transit cargo to and from Romania (export of gasoline to sea vessels and import of diesel from sea vessels or from the Russian railway system). An additional open area of 1.6 ha is suitable for temporary storage of several cargos;
- Ro-Ro Ramp;
- Grain and general cargo terminal with a minimum water depth of 7 m suitable for handling of 10,000 DWT ships and for connecting Giurgiulesti to a higher number of destination ports worldwide;
- Container Terminal – Phase II;
- Production buildings (e.g. terminal project);
- Warehouse Complex;
- Additional office buildings;
- Extension of the business park.

3.3. Port Extension Area

A potential extension area is situated on the other side of the railway bridges. This area is aligned along the river Prut and does not yet have any infrastructure like road access, pavements or quay walls. Detailed development plans for this area do not exist yet.



Figure 3.9. Possible Extension Area



Source: the Consultant

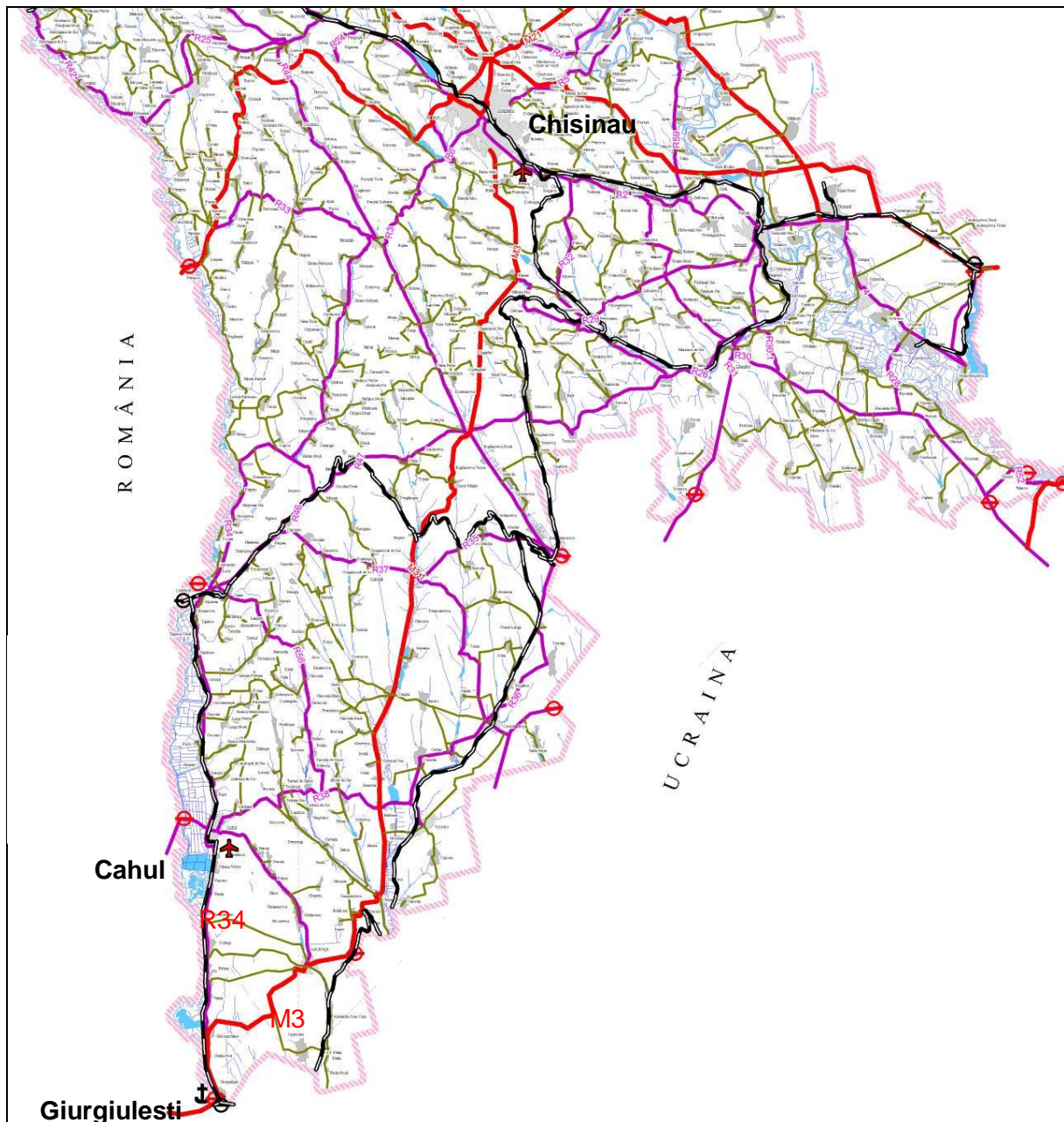


4. HINTERLAND CONNECTIONS

4.1. Road Access

The majority of road traffic from and to Giurgiulesti flows from/to Chisinau via the M3 motorway. The second road connection is the national road R34 toward Cahul as can be seen in the following map.

Figure 4.1. Road Connection Giurgiulesti Port



Source: the Consultant

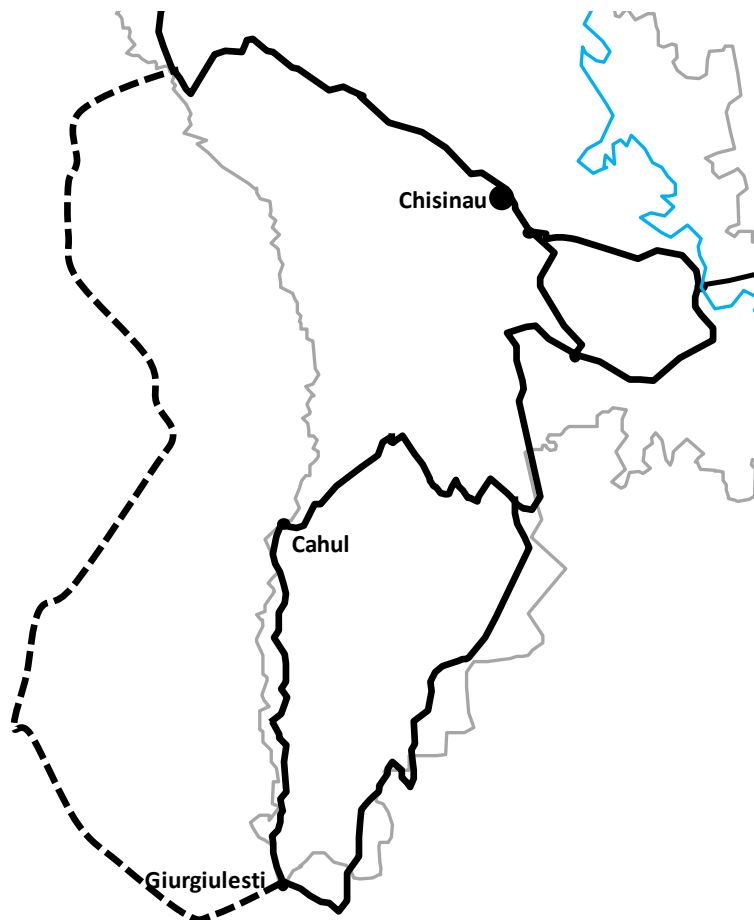


4.2. Connection to the Railway Network

There are three railway connections to Giurgiulesti:

- Eastern line crossing a small part of Ukraine heading north to Chisinau region;
- Middle railway line via Cahul linked to the existing railway line to region Chisinau;
- Western line via Galati - Iasi - Ungheni in Romania parallel to the borderline.

Figure 4.2. Three Railway lines to Giurgiulesti Port



Source: the Consultant

Eastern line Giurgiulesti – Etulia - Basarabasca corridor

This Eastern railway line is currently operational and can satisfy the current demand for freight transportation from Giurgiulesti. The railway tracks are in a better condition than the Giurgiulesti - Cahul line, the travel speed is higher and the total loading capacity is up to 3,000 tons per train, which is three times higher than on the Giurgiulesti - Cahul segment.

The disadvantage of the corridor is that several sections are situated on Ukrainian territory. The longest section (approx. 28 km) is between Giurgiulesti and Etulia. On Ukrainian territory, customs procedures are required and international transit tariffs are applied.



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Middle line Giurgiulesti – Cahul

Since the opening of this railway route in August 2008, about 385,000 tons and 143,000 passengers have been transported. Currently the Giurgiulesti – Cahul railway section is not in a good condition. CFM was always aware of some sensitive slow speed sectors of the railway line. Regular technical revisions were made to keep circulation safe, while deterioration was only a matter of time.

In June 2012 operation was temporarily stopped mainly due to some small landslides along the tracks. Subsequently, an inter-ministerial commission started to investigate the project implementation and the quality of works. Its objectives include the identification of optimal solutions for rehabilitating the lowered section.

According to the vice-minister of Transport and Road Infrastructure the following preliminary explanations for the quality problems can be given:

- The project was implemented under time pressure in only ca. 16 months (instead of 36 months actually required);
- The design was prepared simultaneously with the construction works and land registration / allocation. This led to low work quality and unforeseen risks of deterioration;
- Due to unfinished land registration, the legal status of railway sections remains still uncertain.

These deficiencies lead to consequences in daily railway operation:

- Because of shortcomings in construction, railway sections can only carry limited capacities at low speeds. Flooding and landslides constitute a risk;
- The factors listed above have an adverse impact on the safety and reliability of rolling stock transported on the Giurgiulesti – Cahul segment.

Preliminary estimates of MoTRI for rehabilitation works on the Cahul-Giurgiulesti line are 16-20 million EUR (250-300 million MDL) to fulfill the design requirements. This estimation still has to be finally confirmed by the commission.

Western line via Galati - Iasi - Ungheni in Romania parallel to the borderline

An additional bypass option is the railway corridor Giurgiulesti-Galati-Cantemir or Giurgiulesti-Galati-Iasi-Ungheni (if specific commodities need to be transported from Giurgiulesti to the Ribnita cement plant). Thus, according to CFM, the Cantemir railway border crossing is not included in the commercial border points. The “Network Statement” of the Romanian Railways (CFR) confirms this information.

Giurgiulesti-Galati-Iasi-Ungheni could be an alternative for transporting goods in the northern part of Moldova to the currently closed Giurgiulesti-Cahul segment. Using this railway line would imply paying the higher Romanian transport tariffs and extra time for changing from normal to wide gauge in Ungheni.

To summarize the comparison of the three railway corridors, the following table shows the key parameters for each line:



Table 4.1. Parameters of Railway Corridors

	Giurgiulesti – Cahul – Chisinau	Giurgiulesti – Basarabasca – Chisinau	Giurgiulesti – Iasi – Ungheni
Total length [km]	330	280	270
Length in MD [km]	330	220	-
Length in UKR [km]	-	60	-
Length in RO [km]	-	-	270
Average speed [km/h]	25	60	60
Load per train (t)	<1000	<3000	<1200
Condition	poor	fair	fair
Rehab. cost [mln EUR]		-	-
Border procedures	no	yes	yes
Geometry	curved	straight	straight
International tariffs	no	yes	yes
Terrain type	plain	plain	plain
Currently in operation	no	yes	yes

Source: the Consultant

Evaluating each criterion leads to the following ranking:

Table 4.2. Ranking Table of Railway Corridors to Giurgiulesti*

	Giurgiulesti – Cahul – Chisinau	Giurgiulesti – Basarabasca – Chisinau	Giurgiulesti – Iasi – Ungheni
Total length [km]	0	1	1
Length in MD [km]	1	1	0
Length in UKR [km]	1	0	1
Length in RO [km]	1	1	0
Average speed [km/h]	0	2	2
Load per train (t)	0	2	1
Condition	0	1	1
Rehab. cost [mln EUR]	0	1	1
Border procedures	2	0	0
Geometry	0	2	2
International tariffs	2	1	1
Terrain type	1	2	2
Need of investment	0	2	2
Evaluation	8	16	14

* evaluation system:

2: positive influence

1: neutral influence

0: negative influence

Source: the Consultant



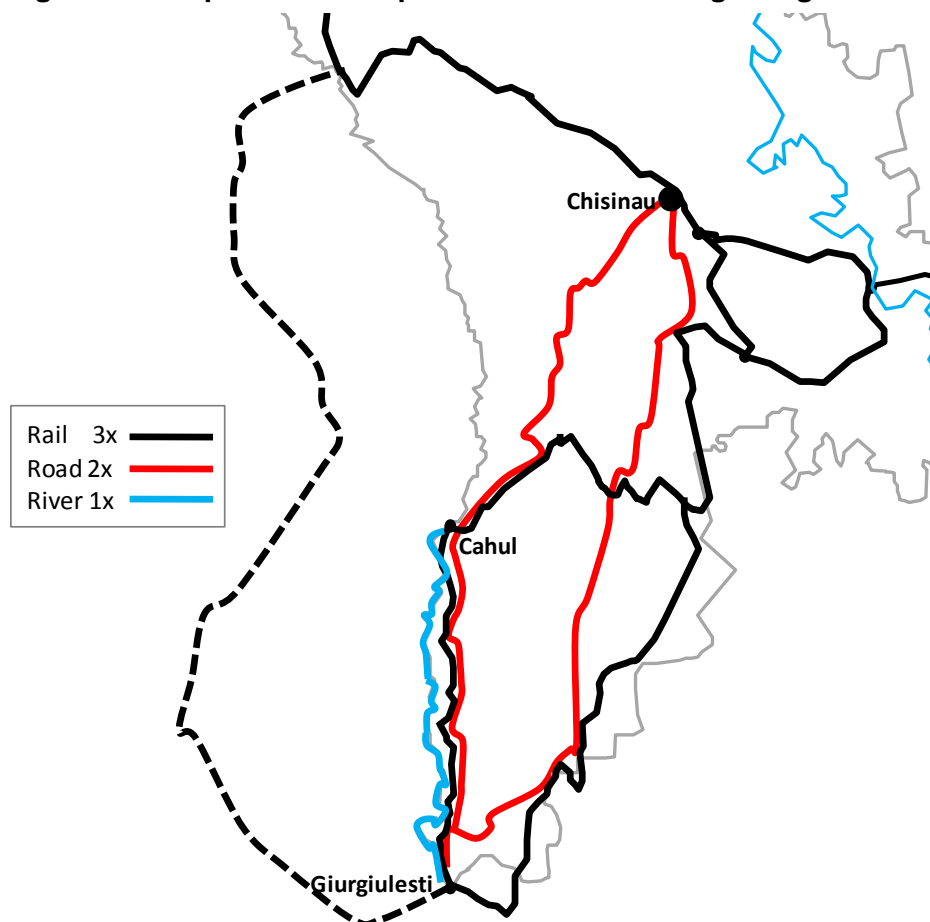
The ranking shows clearly the actual disadvantages for the rail corridor via Cahul. The line via Basarabeasca is currently a good option even if border procedures occur. The line via Romania, which shows also a good ranking, is a further alternative.

4.3. Free Capacity in Port Hinterland Connections

For the final ranking of infrastructure projects, the total utilization rate of all Giurgiulesti hinterland corridors must be considered. In total, there are six transport routes between Giurgiulesti and its hinterland:

1. Moldovan Western railway line via Cahul
2. Moldovan Eastern railway line via Ukraine
3. Romanian railway line via Galati to Ungheni
4. M3 motorway
5. Road R34 toward Cahul
6. River Prut to Cahul

Figure 4.3. Map of Six Transport Routes connecting Giurgiulesti Port to the Hinterland



Source: the Consultant

The following table shows the utilization of Giurgiulesti port hinterland capacity, both for road and rail. Firstly the capacity for both transport modes is calculated, based on the assumption that the following connections are currently in operation between Giurgiulesti and Chisinau:



- Road connection M3 motorway
- Road connection R34 via Cahul
- Rail connection via Basarabeasca (Eastern railway line)

Further, a payload of 25 t per HGV is assumed for the road capacity and 3,000 t per train. The calculation leads to a road capacity of 15 mln t per year for trucks and a rail capacity of 7.2 mln t per year for freight trains. In a next step, the current and future Giurgiulesti port handling volume is calculated in relation to the capacity. Regarding the modal split in the hinterland, a road share of 80% and a rail share of 20% are assumed.

Table 4.3. Utilization of Giurgiulesti Port Hinterland Capacity

Utilization of Giurgiulesti port hinterland capacity		
Utilization of road capacity		
Capacity calculation		
2-lane road capacity	[veh./day]	10,000
Max. HGV share	[%]	10%
HGV capacity per road	[HGV/day]	1,000
No. of road connections	[-]	2
Total HGV capacity	[HGV/day]	2,000
Freight carried per HGV	[tons]	25
Daily road capacity	[tons/day]	50,000
Operational days per year	[-]	300
Yearly road capacity	[tons/year]	15,000,000
2011 utilization (status quo)		
Port handling volume	[tons]	381,000
Road share hinterland	[%]	80%
Volume carried by truck	[tons]	304,800
Utilization of HGV capacity	[%]	2.0%
2032 utilization (forecast)		
Port handling volume	[tons]	2,300,000
Road share hinterland	[%]	80%
Volume carried by truck	[tons]	1,840,000
Utilization of HGV capacity	[%]	12.3%
Utilization of rail capacity		
Capacity calculation		
Single-way track capacity	[trains/day]	20
Max. freight train share	[%]	40%
Freight train capacity per line	[trains/day]	8
No. of rail connections	[-]	1
Total freight train capacity	[trains/day]	8
Freight carried per train	[tons]	3,000
Daily rail capacity	[tons/day]	24,000
Operational days per year	[-]	300
Yearly rail capacity	[tons/year]	7,200,000
2011 utilization (status quo)		
Port handling volume	[tons]	381,000
Rail share hinterland	[%]	20%
Volume carried by train	[tons]	76,200
Utilization of rail capacity	[%]	1.1%
2032 utilization (forecast)		
Port handling volume	[tons]	2,300,000
Rail share hinterland	[%]	20%
Volume carried by train	[tons]	460,000
Utilization of rail capacity	[%]	6.4%

Source: the Consultant

It can be seen that the road and rail capacity in the Giurgiulesti port hinterland is more than sufficient today, as the utilization rates amount to 2.0% and 1.1%, respectively. But even in the future, this fact does not really change. In the central forecast scenario, the total yearly port handling volume is estimated to increase up to 2.3 million tones in 2032. Assuming the same allocation of the transport volume to the corridors, the capacity utilization will rise to 12.3% (road) and 6.4% (rail). The free road capacity can even be improved if CFM manages to increase the rail share to more than 20%.

This means that no additional capacity is needed in the Giurgiulesti port hinterland in the medium to long term. In this regard, the investment for the reactivation of the Prut River is not absolutely necessary.



5. INLAND WATERWAY NAVIGATION

5.1. Infrastructure Status Quo

5.1.1. Existing Waterways

There are two inland waterways in Moldova, which are classified partly as category E (international importance):

- Prut with 716 km navigable waterways (category E only up to Ungheni, 407 km);
- Dniester with 640 km navigable waterway (category E only up to Bender, 228 km).

The classification as category E has been determined in the “European Agreement on Main Inland Waterways of International Importance (AGN)”, done by the United Nations Economic Commission for Europe (UNECE) in Geneva on 19 January 1996. Moldova is Contracting Party of this agreement since 1998.

The AGN provides an international legal and technical framework for the development of inland waterways. The transport issues out of this agreement fall under the responsibility of Governments and are legally binding for the States who become Contracting Parties to them.

According to paragraph 1.1, “the Contracting Parties adopt the provisions of this Agreement **as a coordinated plan** for the development and construction of a network of inland waterways, (...) which they intend to undertake within the framework of their relevant programs”.

Article 2 of this agreement states that:

“1. The network of inland waterways of international importance (...) shall conform to the characteristics set out in annex III to this Agreement **or will be brought into conformity with the provisions of this annex in future improvement work.**

2. Contracting Parties **are called upon to establish national action** plans and/or bilateral or multilateral agreements, such as international treaties, guidelines, memoranda of understanding, joint studies or any other similar arrangements, aimed at elimination of existing bottlenecks and completion of missing links in the network of E waterways crossing the territories of countries concerned.”

The mentioned annex III describes the technical characteristics of E waterways:

“The main technical characteristics of E waterways shall generally be in conformity with the classification of European inland waterways (...).

(i) The class of a waterway shall be determined by the horizontal dimensions of motor vessels, barges and pushed convoys, and primarily by the main standardized dimension, namely their beam or width;

(ii) Only waterways meeting at least the basic requirements of class IV (minimum dimensions of vessels 80 m x 9.5 m) can be considered as E waterways. Restrictions of draught (less than 2.50 m) and of minimum height under bridges (less than 5.25 m) can be accepted only for existing waterways and as an exception;




(iii) When modernizing waterways of class IV (as well as smaller regional waterways), it is recommended that the parameters of at least class Va should be met;

(iv) New E waterways should, however, meet the requirements of class Vb as a minimum. In this regard, a minimum draught of 2.80 m should be ensured.”



The parameters of the mentioned European inland waterway classes IV to Vb are shown in the table below.

Table 5.1. Parameters of European Inland Waterways (class IV to Vb)

Classes of navigable waterways	Motor vessels and barges					Pushed convoys					Minimum height under bridges ^{2/} H (m)
	Type of vessel: General characteristics					Type of convoy: General characteristics					
	Designation	Maximum length L (m)	Maximum beam B (m)	Draught ^{2/} d (m)	Tonnage T (t)		Length L (m)	Beam B (m)	Draught ^{2/} d (m)	Tonnage T (t)	
2	3	4	5	6	7	8	9	10	11	12	13
IV	Johann Welker	80-85	9.5	2.50	1,000-1,500		85	9.5 ^{2/}	2.50-2.80	1,250-1,450	5.25 or 7.00 ^{2/}
Va	Large Rhine vessels	95-110	11.4	2.50-2.80	1,500-3,000		95-110 ^{1/}	11.4	2.50-4.50	1,600-3,000	5.25 or 7.00 or 9.10 ^{2/}
Vb							172-185 ^{1/}	11.4	2.50-4.50	3,200-6,000	

Source: AGN

As shown in the table above the category E waterways shall enable barge transports with at least 1,000 t. The envisaged rehabilitation by MoTRI of River Prut for 600 t barges (as described later in chapter 5.2) would be not sufficient to reach a classification as category E waterway.

To evaluate the significance of the AGN it must be stated that this agreement provides primarily a base for an international legal and technical framework. Its intention is to motivate the participating states to establish national action plans and/or bilateral or multilateral agreements. The AGN has not the status of a Moldovan Law. Thus there is no legal obligation to invest several million EUR for river reactivation only because river Prut is classified partly as category E in the AGN.

It has to be noted that in the AGN no arguments are listed how the classification of the rivers had been compiled. There is no information about the market demands, neither an analysis of the investments nor a profitability calculation. These tasks still have to be fulfilled by the Moldovan Government before it can be decided about the reactivation of river transport.

5.1.2. Existing Ports

There are three former main inland ports:

- Ungheni on the Prut, 407 km from the junction with the Danube
- Tighina/Bender on the Dniester in Transnistria, 228 km from the estuary on the Black Sea
- Ribnita on the Dniester and in Moldovan territory, 434 km from the estuary

Cahul port, which is 85 km north of Giurgiulesti by barge on the river Prut (57 km by road or rail), is another state-owned inland port. Cahul Port was operational between 1976 and 1996 without any significant infrastructure. The port was used more intensively in former times, but there had been no maintenance for 20 years on the land adjacent to the bank. The access road and the roads within the port area are in a bad shape partly without any pavement. The area around consists of two reservoirs with several scrap barges on the ground (see map below).

There is no constructed quay wall at the natural river bank. The section of the river bank which is currently in use is overgrown with trees. The barges are loaded and unloaded by an outdated crane. The goods, mostly construction materials, are kept outside in a small free area.



Figure 5.1. Port of Cahul with Layout Sketch



Source: the Consultant

The average depth in Cahul port area is about 1.2 – 1.4 meters, which is enough to handle 500-600 tone barges. In the absence of reliable statistics, the handling volume in Cahul is assumed to be very low.

5.2. Existing Documents Inland Waterway Strategy

The Government has launched an inland waterway strategy paper in 2008. The “resolution N° 452 from 24.03.2008 for approval of the concept for development of inland water transportation in the Republic of Moldova” was launched by the Prime Minister.

It describes in general the historical development of the Moldovan Inland waterway transportation and the poor condition of the river beds and of the inland ports. The target of the inland waterway strategy is to reactivate the inland waterway navigation. As reasons are being listed the advantage of water transportation for mass products in general and the positive environmental aspects. The Ministry intends to expand the shipping market in Moldova by increasing transport volumes on the inland waterways as well as passenger transports. To achieve these objectives, the Ministry lists the following topics in its strategy paper:

1. “[Ensuring safety of navigation
 - a. Renewing inland waterways (increasing river depth and improving condition of the rivers)
 - b. Ensuring waterway maintenance



- c. Development of a navigation system
2. Modernization and expansion of the shipping fleet
 - a. Cruise ships
 - b. Cargo ships
3. Reconstruction of inland ports located on the Prut and Dniester
 - a. Improving berth conditions
 - b. Installation of handling equipment
 - c. Construction of new terminals for containers, fertilizers and chemicals
 - d. Ensuring direct access to the railway network
4. Introduction of a regulatory and monitoring authority to reduce conflicts of interests
5. Attracting private investments and international funding resources
6. Providing a legal basis for shipping
 - a. Regulating tax policies
 - b. Legal liability of third parties regarding dangerous goods transportation
 - c. Liability of any environmental damages resulting from shipping operations
7. Development of cruise ship tourism]”

This inland waterway strategy paper of the ministry describes general targets for the reactivation of Moldovan inland waterways. All ports shall be reconstructed, the whole fleet shall be modernized and cargo/passenger transportation shall be developed. It reads like an extensive list of investments which would be nice to have, but the required investments are not mentioned. There also is a lack of a detailed demand analysis. Without a volume forecast related to a profitability calculation the mentioned measures cannot be realized.

Another pre-feasibility study published by IPTANA in Romania is the monography “1953-2003, 50 de ani de proiectare pentru infrastructura transporturilor”. It analyzes the development of inland shipping on the Prut River. Three different options for river reconstruction were identified:

- “[Option 1: Horizontal riverbed curve correction and elimination of thresholds (Capacity: barges up to a maximum capacity of 300 tons and a 150 HP tug boat)
- Option 2: Increasing river depth to at least 2 m (Capacity: barges up to 600 tons)
- Option 3: Improvement of navigation conditions and establishment of about 10 diking structures with an average height of 6 m (Capacity: barges from 1,000 to 15,000 tons)]”

Obviously one major priority for the Moldovan Naval Transport Service is to realize Option N°2 in order to reactivate inland shipping from Giurgiulesti to Cahul. According to the Naval Transport Service Department, only three sections need to be revamped. The needed investment indicated for that will take approximately 1.5 – 2 mln MDL (90,000 EUR – 125,000 EUR) in total for making three sections navigable. Costs for additional works for removing trees along the riverside must be added. Furthermore a handling terminal in Cahul is planned in order to develop the cities along the Prut River. Risks caused by flooding in former times shall now be eliminated. However, reliable studies or data proving how floods shall be avoided in the future are not available.

The Naval Transport Service expects that the demand for inland waterway transportation shall increase, but no market demand analysis has been performed yet. The passenger terminal, the new western railway line and the ideas to making the Prut River navigable are examples of projects being carried out without any demand analysis, feasibility study or economic evaluation. These examples show clearly that the projects on traffic infrastructure must be prioritized.



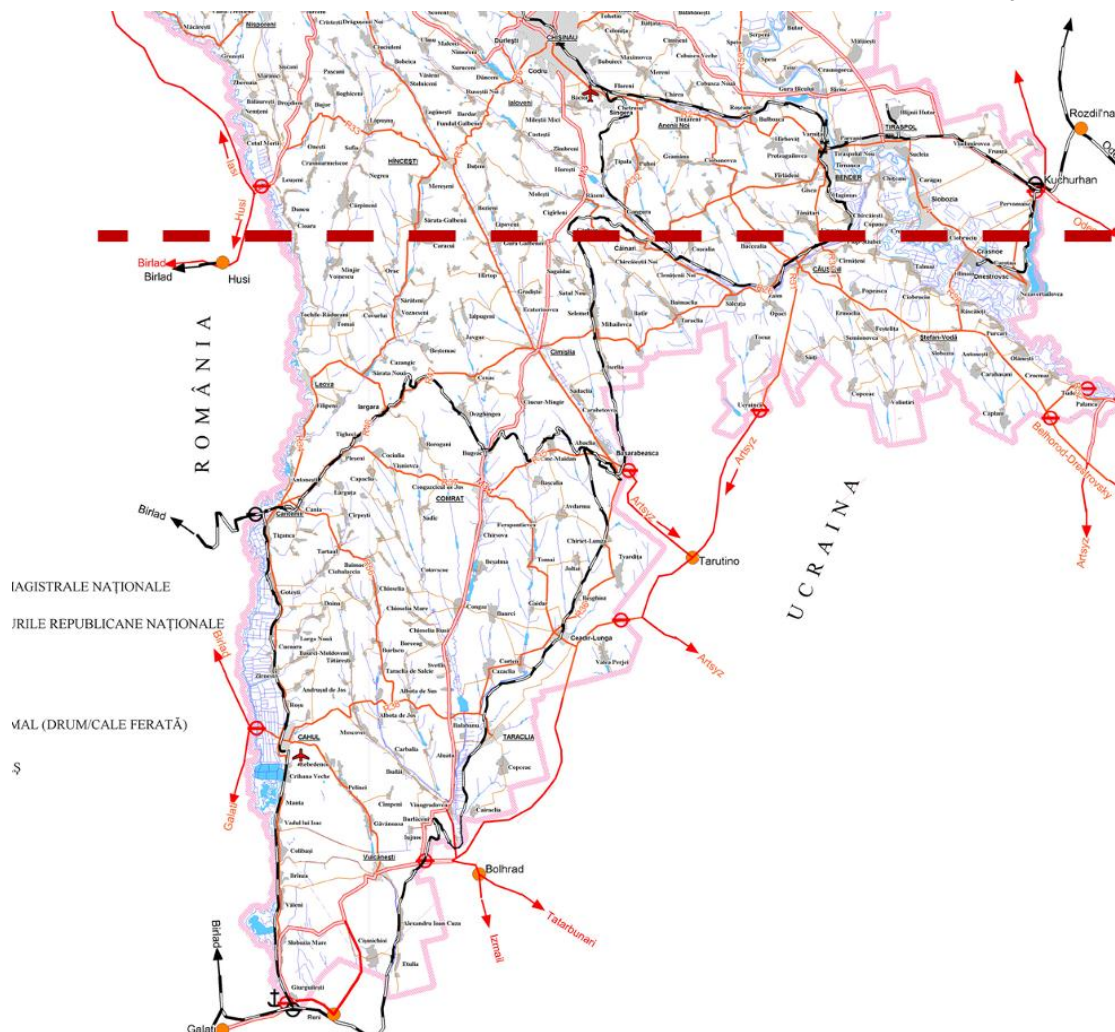
5.3. Requirements for Reactivating Navigation on the Prut River

The Moldovan Rivers had been used intensively during Soviet times mainly for transportation of bulk materials. Today there are almost no inland waterway transports at all. Generally speaking, the inland waterway network is in need of substantial rehabilitation. Detailed studies about the actual navigability do not exist; neither do feasibility studies on the projects required for reinforcement and the related investments.

MoTRI Inland waterways department stated that a minimum annual need of 300,000 tons of construction materials in the southern part of Moldova is required in order to justify opening the inland river navigation on the Prut River. It is planned to ship construction materials from quarries in Romania and to transfer them onto river barges in the port of Giurgiulesti in order to transport them to Port of Cahul for final unloading.

In order to verify this statement, the Consultant carried out a basic demand and feasibility analysis. For this, the Southern part of Moldova was roughly delimited as shown in the picture below:

Figure 5.2. Delimitation of the Southern Part of Moldova for the Demand Analysis



Source: the Consultant



The demand analysis includes road projects (rehabilitation and construction) and rail projects in the delimited southern part of Moldova over the next 10 years. Existing ratios are used for determining the required volume of gravel per road or rail-km. The table below shows the result of the analysis: 60,000 t required gravel for road projects and 25,000 t required gravel for rail projects add up to a yearly gravel demand of 85,000 t in Southern Moldova.

Figure 5.3. Calculation of Gravel Demand for Road and Rail Projects in Southern Moldova

Gravel required for road projects		
Road rehabilitation projects		
Road	Length	
M3	152	km
R3	65	km
R34	125	km
Total	342	km
<i>Required gravel volume per km rehabilitation</i>	766	m ³
Gravel required for rehabilitation projects	260,000	m³
Road construction projects		
Road	Length	
Sl.Mare bypass	20	km
Vulcanesti bypass	9	km
Cimislia bypass	35	km
Comrat bypass	18	km
Total	82	km
<i>Required gravel volume per km construction</i>	2,273	m ³
Gravel required for construction projects	190,000	m³
Total road projects		
Total volume of required gravel	450,000	m³
<i>m² per ton gravel</i>	0.75	
Total tons of required gravel	600,000	t
Construction period	10	yr.
Gravel required per year for road projects	60,000	t
Gravel required for rail projects		
Rail project-km per year	5	km
<i>Required gravel volume per km</i>	5,000	t
Gravel required per year for rail projects	25,000	t
Total gravel required per year	85,000	t

Source: the Consultant



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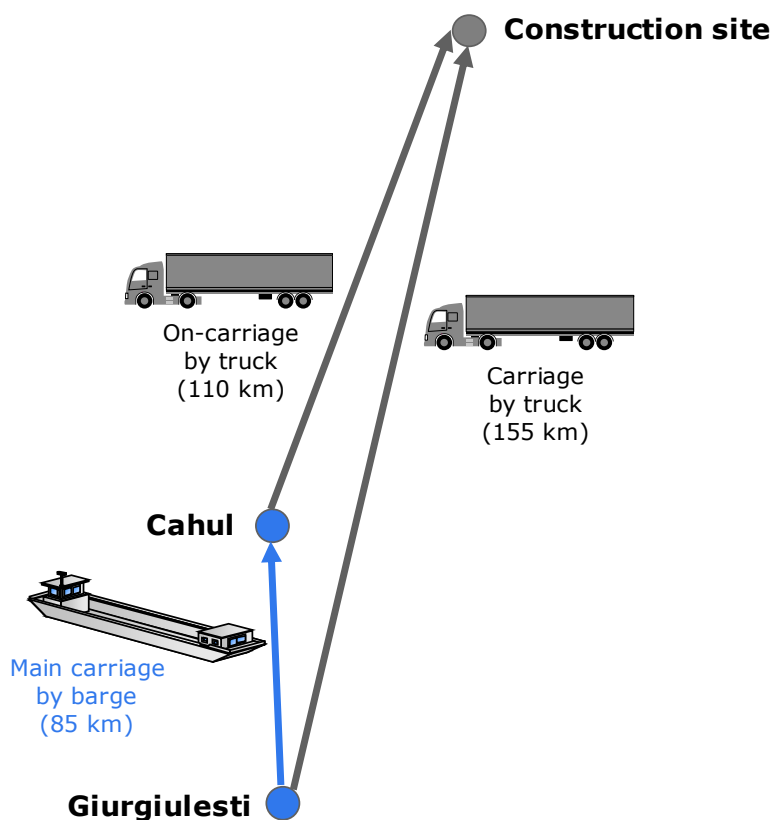
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The 85,000 t gravel demand calculated by the Consultant differs largely from the 300,000 t given by MoTRI. Thus, two scenarios are evaluated in the following section.

In both scenarios, a gravel transport from Giurgiulesti to a potential construction site located in the center of the delimited southern part of Moldova is simulated. Two alternative transport chains are compared:

- a direct carriage by truck (155 km);
- a carriage by river barge to Cahul (85 km) plus on-carriage by truck (110 km).

Figure 5.4. Examples of Gravel Transport Chains Giurgiulesti - Construction Site



Source: the Consultant

For the calculation of the different transport possibilities, several geographical, technical and operational input factors have been assumed (see next table). Barges with a maximum capacity of 600 tonnes are assumed for the navigation on the Prut River. As a potential barge service would have a rigid time schedule, a utilization rate of 80% is assumed. It is further assumed that the utilization rate for the 25 tonnes trucks is 100%. The 220 operating days per year are based on a 5-day week.

In scenario 1, the price for barge handling must amount to 4.00 EUR per ton, in order that the port operating company can work economically. Due to economies of scale, the barge handling price can be reduced to 2.00 EUR per ton in scenario 2. The truck costs are generally projected at 2.00 EUR (handling costs per ton) respectively 1.00 EUR (operational costs per km).



Figure 5.5. Input Factors for Transport Chain Comparison

Input factors					
Geographical			Operational		
Distance Giurgiulesti-Cahul by river Prut	85	km	Operating days per year	220	d
Distance Cahul to construction site	110	km	Utilization rate barge	80%	
Distance Giurgiulesti to construction site	155	km	Utilization rate truck	100%	
Technical			Barge handling costs per ton (Scen. 1)	4.00	€
Capacity per barge	600	t	Barge handling costs per ton (Scen. 2)	2.00	€
Capacity per truck	25	t	Truck handling costs per ton	2.00	€
			Truck costs per km	1.00	€

Source: the Consultant

By means of the given input factors, roundtrips are calculated both for a barge and a truck service (see next table). Assuming a rigid time schedule for the barge service with one departure per operating day, the round-trip takes 3 days including loading and unloading time, and therefore 3 barges are needed (in the first scenario). The pushers do not need to wait for loading or unloading, thus 2 pushers are sufficient for the barge service (in the first scenario). In the second scenario, the number of barges and pushers triples.

Regarding the truck service, the roundtrip is feasible in one day, for the relation between Giurgiulesti and the construction site (155 km) as well as for the relation between Cahul and the construction site (110 km). Thus, for both relations, 16 trucks are needed in the first scenario and 55 trucks in the second scenario.

Figure 5.6. Roundtrip Calculations

Scenario 1 - Roundtrip calculation			Scenario 2 - Roundtrip calculation		
Barge service			Barge service		
Annual gravel volume to be carried	85,000	t	Annual gravel volume to be carried	300,000	t
Number of roundtrips p.a.	177		Number of roundtrips p.a.	625	
Barge roundtrip duration	3	d	Barge roundtrip duration	3	d
Roundtrips per barge p.a.	59		Roundtrips per barge p.a.	69	
Required number of barges	3		Required number of barges	9	
Pusher roundtrip duration	2	d	Pusher roundtrip duration	2	d
Roundtrips per pusher p.a.	89		Roundtrips per pusher p.a.	104	
Required number of pushers	2		Required number of pushers	6	
Truck service			Truck service		
Annual gravel volume to be carried	85,000	t	Annual gravel volume to be carried	300,000	t
Truck roundtrip duration	1	d	Truck roundtrip duration	1	d
Truck roundtrips p.a.	3,520		Truck roundtrips p.a.	12,100	
Required number of trucks	16		Required number of trucks	55	

Source: the Consultant

When comparing a barge-truck transport chain to direct carriage by truck, it must be noted that a considerable investment has to be made for the establishment of a barge service, while the truck



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infrastructure does already exist. The main share of the investment for the barge service is the costs for the reactivation of the Prut River. International benchmarks have been researched to estimate the costs for river dredging/deepening (see next table). In the examples, the costs per km vary between 3.0 and 0.6 mln EUR. It is obvious that these investments depend on a range of parameters like existing depth, future depths, condition of river bed, hydrological components, environmental aspects and geographical conditions.

At this project stage, the costs for the reactivation of the Prut River can roughly be estimated at 0.3 mln EUR (4.5 mln MDL) per km, adding up to 25 mln EUR (375 mln MDL) for the whole Giurgiulesti-Cahul section. Even if this amount is much higher than the investments mentioned by MoTRI, it must be stated that this estimate is oriented at the low level of international benchmarks. Only by a detailed feasibility study including measurements of water levels the final investment can be determined.

Figure 5.7. International Benchmarks for River Deepening/Dredging

River	Section	Length	Deepening	Total costs	Costs per km
Elbe (Germany)	Hamburg - Cuxhaven	136 km	1.5 m	400 mln. € (est.)	3.0 mln. €
Delaware River (USA)	Philadelphia - estuary	165 km	1.5 m	220 mln. € (est.)	1.3 mln. €
Columbia River (USA)	Portland - Astoria	148 km	1.0 m	148 mln. €	1.0 mln. €
Main (Germany)	Bamberg - Würzburg	136 km	0.4 m	85 mln. € (est.)	0.6 mln. €

Source: the Consultant

Furthermore, the Port of Cahul has to be modernized for approximately 2.6 mln EUR (39 mln MDL) and the pushers and barges have to be purchased. The required investments are illustrated in the tables below:

Figure 5.8. Required Investment for Inauguration of Barge Service Giurgiulesti-Cahul

Scenario 1		Scenario 2	
Investment for barge service		Investment for barge service	
Price for 2 pushers	300,000 €	Price for 6 pushers	900,000 €
Price for 3 barges	60,000 €	Price for 9 barges	180,000 €
Total investment	360,000 €	Total investment	1,080,000 €

Source: the Consultant

Figure 5.9. Required Investment for Port of Cahul

Investment for Port of Cahul			
	Amount	Price per unit	Total price
Earth works [m ³]	30,000	15 €	450,000 €
Pavement [m ²]	10,000	100 €	1,000,000 €
Quay wall [m]	100	10,000 €	1,000,000 €
Excavator [no.]	1	80,000 €	80,000 €
Gate / office [lump]	1	40,000 €	40,000 €
Energy supply [lump]	1	40,000 €	40,000 €
Total investment			2,610,000 €

Source: the Consultant



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For the calculation of the annual costs of the barge-truck transport chain, only the direct costs for the barge service (pushers, barges, operational costs, handling costs) and the costs for the on-haulage by truck (including truck handling) are assumed. As already mentioned, the price for the barge handling is calculated on the economic feasibility of the port operating company.

However, the annual costs for the river dredging (maintenance, interest) are not included in the transport chain calculation. These costs, amounting to approx. 2 mln EUR (30 mln MDL) per year, have to be paid by the Moldovan taxpayer.

The direct carriage by truck requires only the truck costs (1.00 EUR per km, including road fees) and the handling costs.

Thus, the costs per carried ton differ between the barge-truck transport chain and the direct carriage by truck. The costs for the direct truck relation amount to approx. 15 EUR/t (225 MDL/t) in both scenarios, whereas the ton carried by barge-truck costs approx. 23 EUR (345 MDL) in Scenario 1 and 18 EUR (270 MDL) in Scenario 2 (see table below).

Figure 5.10. Comparison of Transport Chain Costs

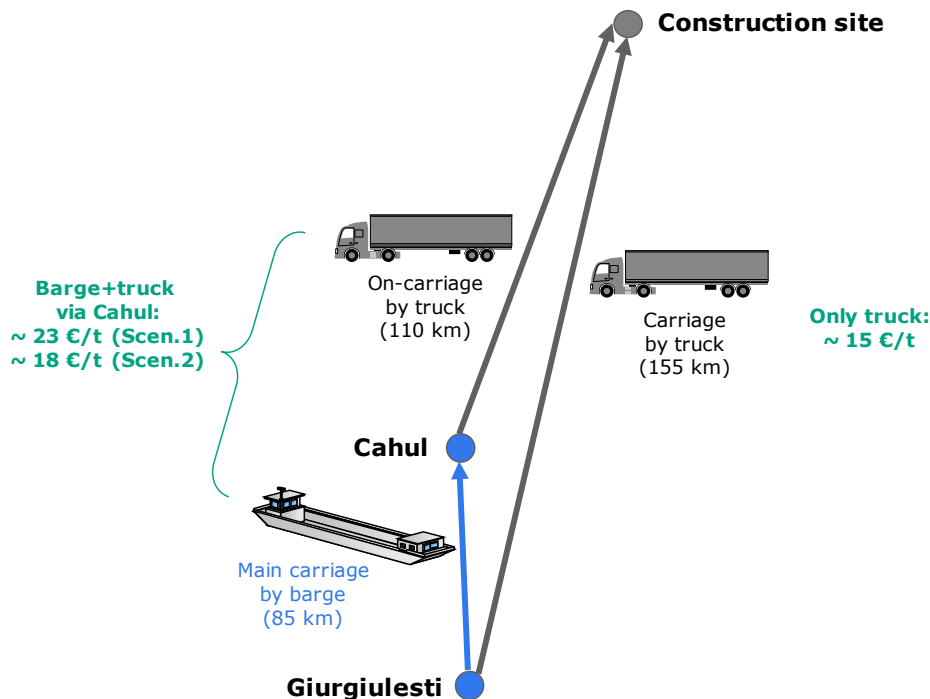
Scenario 1		Scenario 2	
Yearly costs barge+truck		Yearly costs barge+truck	
Pushers/barges: depreciation, maintenance, interest	50,400 €	Pushers/barges: depreciation, maintenance, interest	151,200 €
Operational costs for barge service	276,800 €	Operational costs for barge service	830,400 €
Barge handling costs	680,000 €	Barge handling costs	1,200,000 €
Truck handling costs	176,000 €	Truck handling costs	605,000 €
On-haulage by truck to final construction site (110 km)	774,400 €	On-haulage by truck to final construction site (110 km)	2,662,000 €
Total yearly costs	1,957,600 €	Total yearly costs	5,448,600 €
Costs per carried ton	23 €	Costs per carried ton	18 €
Yearly costs truck		Yearly costs truck	
Truck costs Giurgiulesti - construction site (155 km)	1,091,200 €	Truck costs Giurgiulesti - construction site (155 km)	3,751,000 €
Handling costs	176,000 €	Handling costs	605,000 €
Total yearly costs	1,267,200 €	Total yearly costs	4,356,000 €
Costs per carried ton	15 €	Costs per carried ton	15 €

Source: the Consultant

The next figure summarizes the analysis. A direct carriage by truck from Giurgiulesti to a construction site is economically more advantageous than a barge-truck transport chain.



Figure 5.11. Examples of Gravel Transport Chains from Giurgiulesti to a Potential Construction Site



Source: the Consultant

Although in June 2012 the Moldovan Government has announced the reactivation of transportation on the Prut River between Giurgiulesti and Cahul, the Consultant states that this project is not profitable because of the following reasons:

- High investments have to be made to establish the barge service (especially for the reactivation of the navigation on the river Prut) while the road infrastructure already exists;
- The additional annual costs for the river dredging (maintenance, interest) have to be paid by the Moldovan taxpayer;
- Compared to a direct carriage by truck, a barge-truck transport chain generates higher costs per carried ton;
- The distance Giurgiulesti-Cahul by river (85 km) is too short to take advantage of the economies of scale of the barge service;
- The annual demand of 300,000 t of gravel stated by the MoTRI Inland waterways department has not been confirmed by the Consultant's analysis. On the contrary, even the 85,000 t given by the analysis are based on a relatively large southern part of Moldova;
- There is additional capacity on the already existing hinterland connections from Giurgiulesti;
- The seasonal variations of water level can influence negatively the inland waterway transportation. It can lead to limitations of the year around navigability. Low water periods can appear in summer and during long frost periods. The Danube may freeze for a certain time in strong winters. The same can happen for the Prut. On the other hand, high water is a factor which can limit the feasibility of operations because it hinders the passage under bridges. All this factors reduce either the number of trips or lead to a reduction of ship loading volumes.



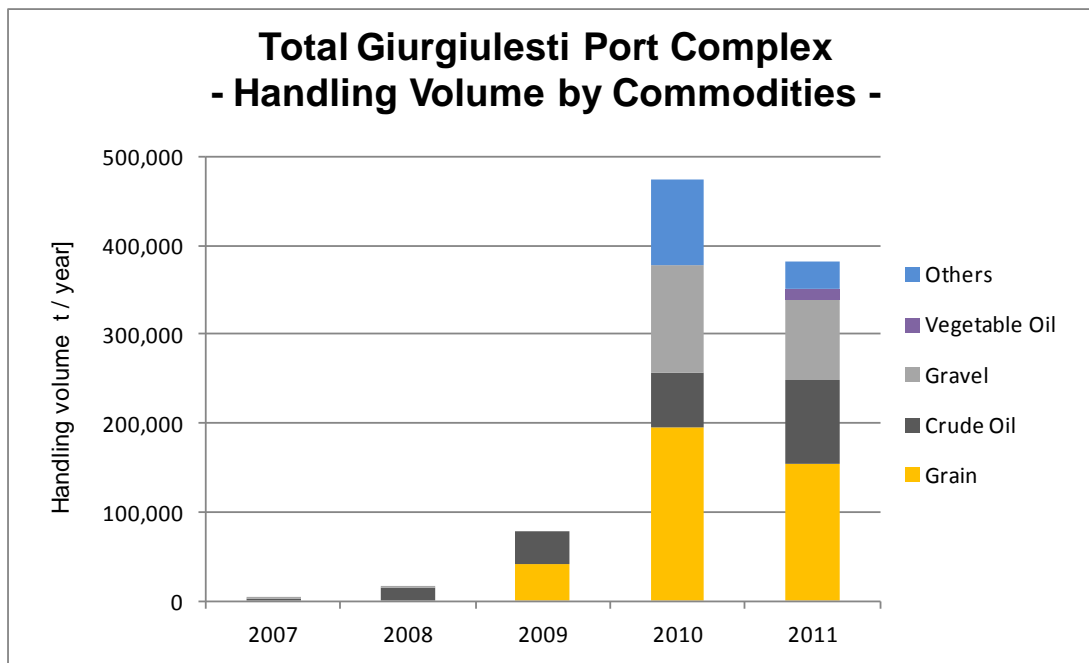
6. TRAFFIC DEMAND AND FORECAST

6.1. Past and Current Handling Volumes

Giurgiulesti International Free Port (GIFP) partly reflects the freight structure of Moldova as a whole. Export is completely dominated by grain. Import flows are actually split about 50%/50% between construction materials (such as gravel and sand) and oil.

As shown in the figure below, with the engagement of Danube Logistics the total handling volume in the whole Giurgiulesti Port Complex rose from a low level to almost 0.5 mln t in 2010. For 2011 a decrease to 0.38 mln t occurred including both Giurgiulesti International Free Port and the state passenger/freight terminal.

Figure 6.1. Freight Volumes by Commodity handled by the Giurgiulesti Port Complex, 2007 - 2011



Source: Danube Logistics, Port Captain

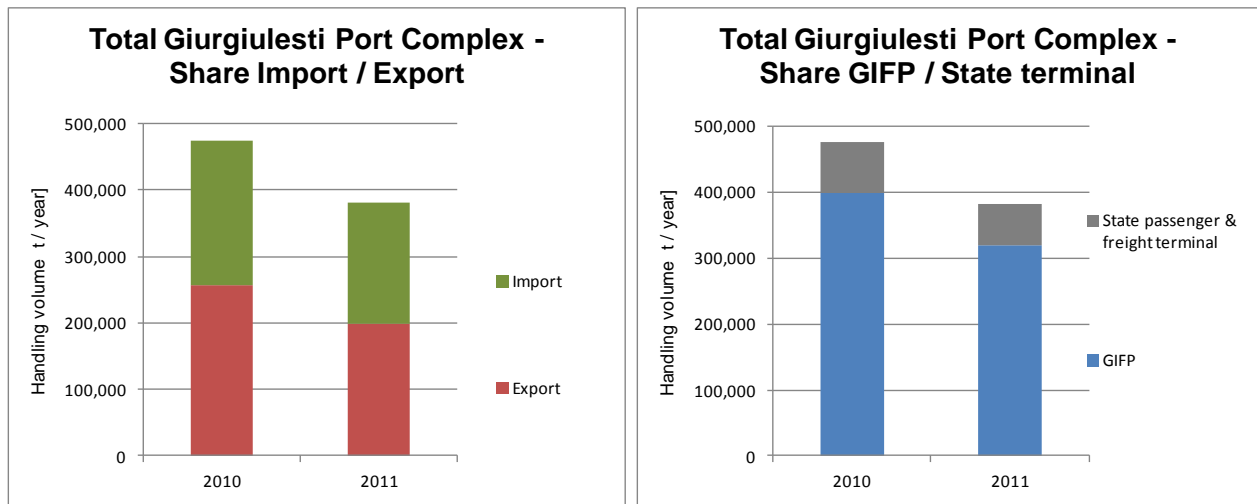
The figure above illustrates the development of crude oil volumes. Crude oil handling was established in the port in 2007 and the handled volume reached 94,000 t in 2011. The handled volume of export grain has also increased considerably, reaching a maximum of 200,000 t in 2010.

Most outbound volumes are shipped to Africa, the Mediterranean Sea and the Black Sea (total 219,000 t in 2010), while the main inbound destination is Romania (150,000 t in 2010). In 2010, no transit volumes were handled in the port of Giurgiulesti.

As shown in the figure below, the total import and export volumes are almost balanced, while the import and export volumes of any given single commodity type may differ considerably.



Figure 6.2. Import / Export Freight Volumes through Giurgiulesti Port and Split of Traffic between GIFP / State Terminal, 2010 - 2011



Source: Port Captain

Regarding the share of volumes there is a clear domination of the private GIFP with a current share of 84% of the total handling volume. The state passenger and freight terminal which handles mainly gravels has a share of 16% of the total handling volume.

6.2. Traffic Demand by Commodity

The historical development of the port handling volumes over the last 20 years and the recent increase since 2007 shows that a regression analysis based on past values does not lead to a reasonable forecast. Furthermore, a linear projection of the trend from the last four years would result in too high estimate values for future transport volumes.

In the first years after establishing the handling of new commodities like fuel and grain, growth rates were high (200% on average). It cannot be expected that growth will proceed at such high rates in the following years. The potential demand per type of cargo within the Port of Giurgiulesti depends on the following main parameters:

- Future port infrastructure (draught, ship size that can be handled, quay length, handling equipment);
- Hinterland catchment area;
- Competitive situation of other ports such as Reni (located close to Giurgiulesti on the Danube but in Ukraine), Odessa (on the Black Sea in Ukraine), Galati (located close to Giurgiulesti on the Danube but in Romania), Ismail (also on the Danube delta in Ukraine) and Constanta (on the Black Sea in Romania with access to the Danube);
- Competitive situation with other transport modes such as road and rail;
- Supply chain cost for alternative routes;
- Demand within Moldova for relevant commodities;
- Potential transit routes;
- General development within Moldova regarding population, purchasing power and type of industry.



Grain export

The recent high increase in grain handling is mainly explained by the volume shifts from the Port of Reni to the Port of Giurgiulesti. Trans-Oil as the largest trader of Moldovan grain deals with grain from local farms, but also owns small production facilities in Causeni, Tirnova and Fintinita. Regarding the total volume handled, grain is the most important commodity with a share of about 40%. Relating to the current handled grain volumes in Reni and the total production volume, there is still a reliable increase potential. With respect to the option of a new berth with a depth of 7m there is a potential to double at least the grain volumes within 5-7 years. Nevertheless, the potential yearly variations in grain production have to be considered. Poor harvests in Moldova could lead to sharp declines in export trade. In addition, bad harvests in neighboring countries like Russia could lead to a redirection of grain export via land transportation instead of via Giurgiulesti.

Oil import

Imported oil contributed a 25% share to Giurgiulesti's port handling volume in 2011. As no binding analysis of the expected fuel consumption in Moldova is available, there is no commodity related forecast for oil volumes.

Import of gravel and sand

According to existing studies about the future development in Moldova, a continuous demand for construction material is expected. These import volumes depend mainly on the prospective investment in the Moldovan road network as a future backbone for logistics performance. Import by ship is highly suitable for these bulk products and increased up to 90,000 tons in 2011. For the central case, import volumes for this commodity are forecasted to develop at least equal with the average GDP growth rate.

Container import and export

Even if containers cannot be classified as a separate commodity, this transportation unit is used for certain kinds of cargo like consumer products, electronics, food products or semi-finished products. All of these goods are comparatively high value goods in contrast to bulk commodities. MSC Moldova established a container shuttle between Istanbul and Giurgiulesti in the second half of 2011. This represents a very important milestone for increasing the depth of value added logistics services in Moldova. Even if the total container handling volume will not reach a share of more than about 30% of the total port handling volume, this kind of business has several positive effects regarding the general economic development, some of which are listed below:

- Increase of handling revenue (Total Handling Charge (THC) of at least 160 EUR per container);
- Indirect effect on additional services (container storage, maintenance);
- Possibility to import high value semi-finished products linked with follow-up services like assembling and finishing.

A functioning container supply chain is at least one necessary prerequisite for the gradual transformation of the Republic of Moldova from an agriculture-driven structure towards a more industrialized economy.

In fully industrialized countries, the ratio of the population size to the total container volume is about 10 inhabitants per TEU. Assuming an increase of the industrialization rate for Moldova, an estimate of future container volumes looks like this:



Table 6.1. Forecast Container Volumes through the Port of Giurgiulesti

	2012	2022	2032
Population [mln. people]	3.5	3.5	3.5
Max. ratio inhabitants / TEU	10	10	10
Degree of industrialization	20%	40%	65%
Total TEU in Moldova	70,000	140,000	227,500
Max. share Giurgiulesti	20%	40%	40%
Max. TEU Giurgiulesti	14,000	56,000	91,000

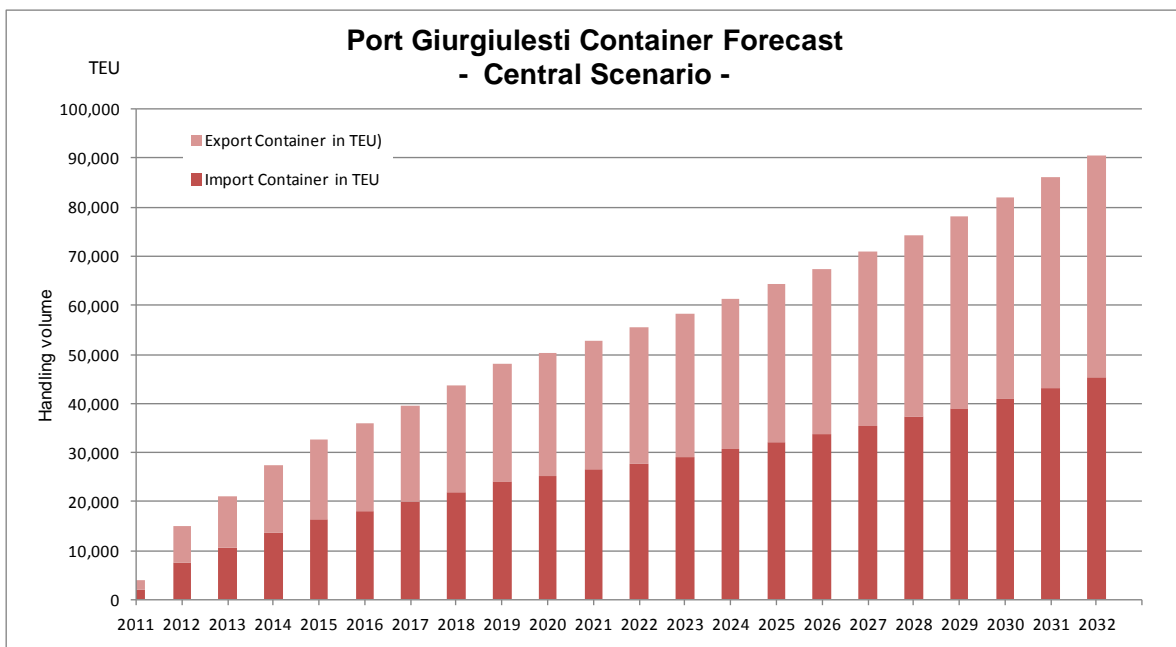
Source: Port Captain, the Consultant

About 230,000 TEU may be transported in Moldova as a whole in 2032 (excluding transit volumes). Sea ports naturally play a very important role in container handling. For that reason, the share of Giurgiulesti could rise to up to 40%, corresponding to 91,000 TEU, in 2032.

The container business is in general highly affine to sea ports. As Giurgiulesti Port Complex is the only Moldovan port with access to the sea it is reasonable that a share higher than the average can be achieved. According to interviews with market players and with the operator of GIFP, the target is to handle 30,000 - 40,000 TEU in 2017.

In combination with the ratio factor inhabitants/TEU, this leads to the following container forecast:

Figure 6.3. Forecast Container Volumes through the Port of Giurgiulesti



Source: the Consultant

It should be noted that the container statistics always include a share of empty containers, especially for export containers. To reduce this imbalance, a fraction of the grain exported today is shipped in containers protected by special inlays.



6.3. Forecast of Total Port Handling Volumes

To complement the analysis by commodity, a forecast of total port handling volumes was done at an aggregate level. The overall growth rate is assumed to depend on the expected increase of GDP. Taking into consideration that Giurgiulesti Port complex has a high chance to attract transport volumes, even for the central case a higher growth than the GDP growth rate is calculated. This is based on the reliable business model of GIFP and the opportunity to attract more cargo by encouraging the establishment of companies in the adjacent Business Park. Starting with a growth rate of 11.5% in the first decade, a second phase with growth rates below 10% is predicted to follow due to the slight decline of the GDP growth rate after 2022.

The high scenario differs from the central scenario by 30% based on the assumption of a stronger performance of the Moldovan economy. In this scenario, the port of Giurgiulesti plays an even more important role leading to a total forecast volume of 2.9 mln t in 2032. Equally the low scenario differs from the central scenario by -30%. The considerable difference between the scenarios is mainly due to the long forecast period of 20 years on the one hand and to the high number of influencing factors on the other hand.

For example, the mere assumption of a container volume of up to 90,000 TEU corresponds to a handling volume of about 700,000 t. The assumed growth rates and the estimated volumes are shown below for each scenario.

Table 6.2. Port Volumes and Growth Rates per Scenario

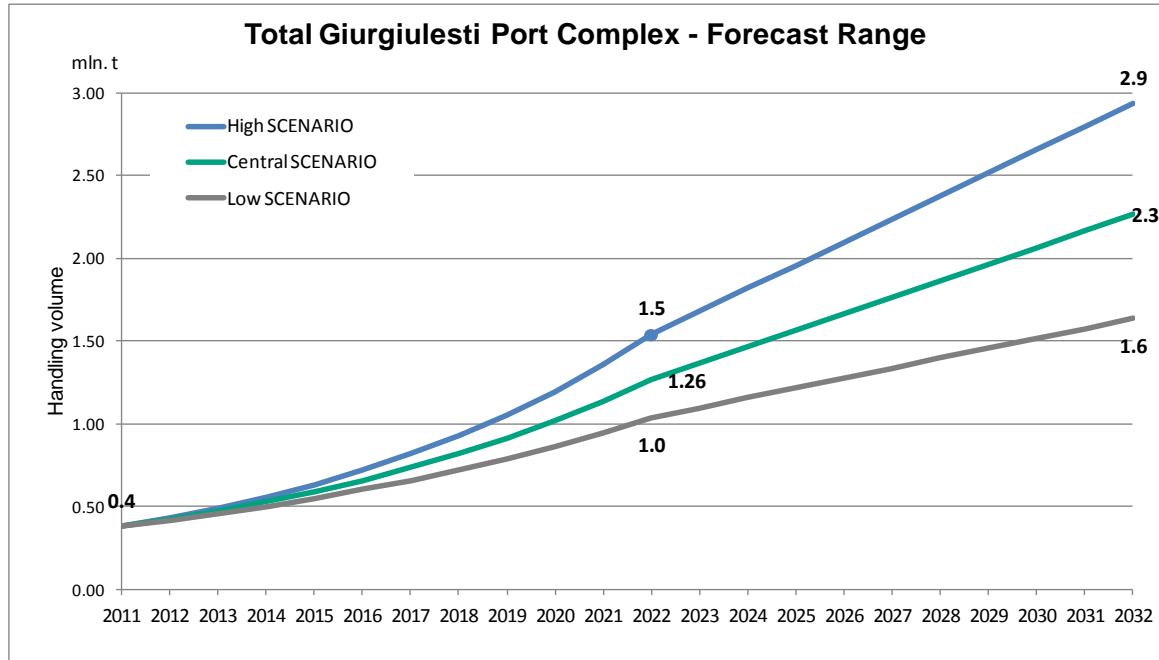
Low SCENARIO	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Handling Volumes	381,227	417,444	457,101	500,525	548,075	600,142	657,156	719,586	787,946	862,801	944,767
Growth rate		9.50%	9.50%	9.50%	9.50%	9.50%	9.50%	9.50%	9.50%	9.50%	9.50%
Low SCENARIO	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Handling Volumes	1,034,520	1,094,520	1,154,520	1,214,520	1,274,520	1,334,520	1,394,520	1,454,520	1,514,520	1,574,520	1,634,520
Growth rate	9.50%	5.80%	5.48%	5.20%	4.94%	4.71%	4.50%	4.30%	4.13%	3.96%	3.81%
Central SCENARIO	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Handling Volumes	381,227	425,068	473,951	528,455	589,228	656,989	732,543	816,785	910,715	1,015,447	1,132,224
Growth rate		11.50%	11.50%	11.50%	11.50%	11.50%	11.50%	11.50%	11.50%	11.50%	11.50%
Central SCENARIO	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Handling Volumes	1,262,430	1,362,430	1,462,430	1,562,430	1,662,430	1,762,430	1,862,430	1,962,430	2,062,430	2,162,430	2,262,430
Growth rate	11.50%	7.92%	7.34%	6.84%	6.40%	6.02%	5.67%	5.37%	5.10%	4.85%	4.62%
High SCENARIO	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Handling Volumes	381,227	432,693	491,106	557,405	632,655	718,064	815,002	925,028	1,049,906	1,191,644	1,352,516
Growth rate		13.50%	13.50%	13.50%	13.50%	13.50%	13.50%	13.50%	13.50%	13.50%	13.50%
High SCENARIO	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Handling Volumes	1,535,105	1,675,105	1,815,105	1,955,105	2,095,105	2,235,105	2,375,105	2,515,105	2,655,105	2,795,105	2,935,105
Growth rate	13.50%	9.12%	8.36%	7.71%	7.16%	6.68%	6.26%	5.89%	5.57%	5.27%	5.01%

Source: the Consultant

The graphic below shows the overview for the low, central and high scenarios. The estimated decline in growth rates after 2022 can be seen clearly. According to interviews with market players, a target of 1 - 1.5 mln t within 10 years seems realistic. This expectation is reflected in the central scenario with a handling volume of 1.26 mln t in 2022. This means that the handling volume will be tripled within 10 years, which is a realistic estimation with respect to the ongoing professional marketing activities and provision of high service levels at reasonable tariffs.



Figure 6.4. Overview of Volumes Handled by the Port of Giurgiulesti by Scenario



Source: the Consultant



7. COMPETITIVE ANALYSIS

7.1. Analysis of Danubian Competitor Ports

Three other Danubian ports have been identified as competitor ports for Giurgiulesti:

- Port of Galati in Romania
- Port of Reni in Ukraine
- Port of Izmail in Ukraine

All of them are located on the Danube banks and are classified as sea ports. In this area, the Danube is accessible for sea-river vessels up to the limit of 10,000 DWT. Galati and Reni are in direct neighborhood to Giurgiulesti, less than 10 kilometers away. The distance between Giurgiulesti and Izmail is about 70 km. The following tables compare the Danubian competitor ports regarding their main parameters. The first table shows quantitative parameters.

Table 7.1. Quantitative Analysis of Danubian Competitor Ports

Port	Giurgiulesti	Galati	Reni	Izmail
Cargo turnover (2010)	0.47 mln. t (0.38 mln. t in 2011)	6.4 mln. t	1.6 mln. t	6.6 mln. t
Capacity (2010)	1 - 1.5 mln. t	17.1 mln. t	14.5 mln. t	8.5 mln. t
Free capacity (2010)	80 %	63 %	89 %	22 %
Share (2010):	2010:	2009:	2010:	2010:
- Import	- 40.7 %	- Inbound	- 0 %	- 0.9 %
- Export	- 59.3 %	- 40.1 %	- 20 %	- 79.4 %
- Transit	- 0 %	- Outbound	- 80 %	- 18.7 %
- Domestic	- 0 %	- 59.9 %	- 0 %	- 1.0 %
Commodities (2010)	- Refined Oil - Grain - General cargo - Gravel and sand - Container	- Ore - Steel - Passenger	- Petroleum (37.6 %) - Ore (23.7 %) - Grain (21.4 %) - Metals (4.5 %) - Coal (1.2 %) - Container (1.4 %)	- Ore (61.2 %) - Coal (26.6 %) - Metals (3.7 %) - Coke (3.0 %) - Building materials (1.4 %)
Min. depth at berth	7.30 m (oil terminal Danube) 5.00 m Prut terminal	7.30 m	7.50 m	7.50 m
Acceptable ship size	7,000 DWT (for grain, bulk, general cargo)	10,000 DWT	10,000 DWT	10,000 DWT
Port area	120.0 ha	86.4 ha	94.0 ha	107.5 ha
Storage area	5.0 ha	54.6 ha	22.5 ha	22.1 ha
Total berth length	1,000 m	7,065 m	3,927 m	2,619 m
Parking places for trucks	10	45	0	0

Source: Magazine Ports of Ukraine plus Feb 2011 (N° 103), Maritime Danube Ports Administration, Port Captain MoTRI, the Consultant



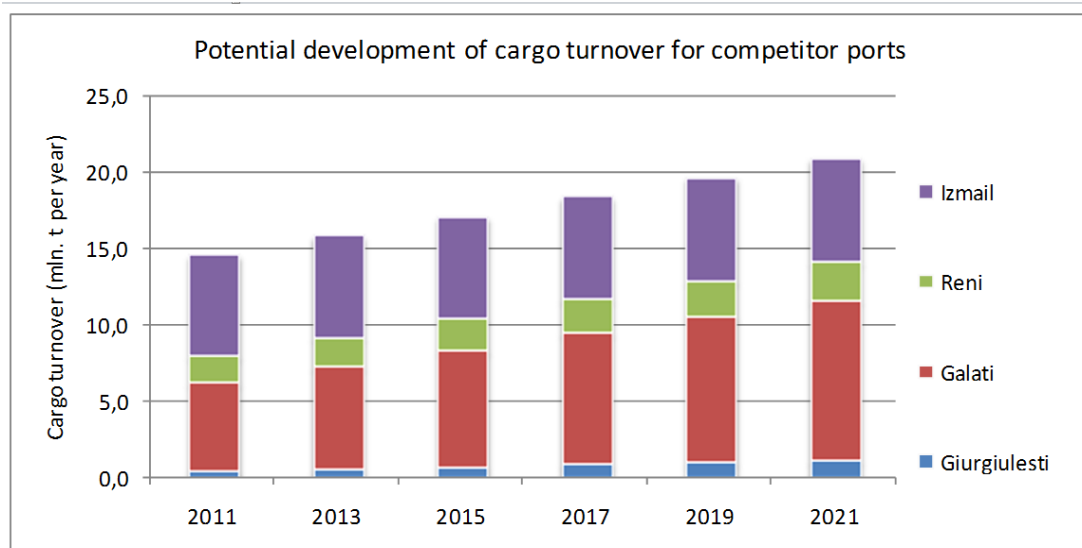
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As can be seen in the table above, Izmail and Galati are in the leading position regarding the total volume. Reni, which once was the main Danube port for the former Soviet Republic, has fallen far behind its former performance. Obviously all four ports have additional capacities for volume increases. Reni has by far the highest transit share of 80% which is mostly transit via Moldova. All four ports handle bulk products such as coal, iron ore and construction material. Refined oil and grain represent another significant share.

The forecast of handling volumes for each competitor port would extend the scope of this study. To estimate the future role of Giurgiulesti within this port range it can be estimated that the ports will manage to reach again their peak volumes before the financial crisis 2008-2009 within 10 years. Even if Giurgiulesti port would achieve more than 1 mln tons, it would represent a total share of 5% compared to Izmail, Reni and Galati. This takes already into account that Giurgiulesti will be able to gain a fraction of the volumes Reni port. The following figure shows a potential development until 2021.

Figure 7.1. Quantitative Analysis of Danubian Competitor Ports



Source: Magazine Ports of Ukraine plus Feb 2011(N° 103), the Consultant

The volume forecast depends not only on the technical conditions but also on soft factors. As can be seen in the following matrix, the four ports are compared in a qualitative way.

Table 7.2. Qualitative Analysis of Danubian Competitor Ports

Port	Giurgiulesti	Galati	Reni	Izmail
Multimodality	+	+	+	+
Rail connection to Moldova	++	--	+	-
Road connection to Moldova	++	-	+	-
Free capacity (2009)	++	+	++	+
Depth at berth	-	+	+	+
Acceptable ship size	-	+	+	+
Existing storage area	+	++	+	+
Storage area extension possibility	++	++	+	+



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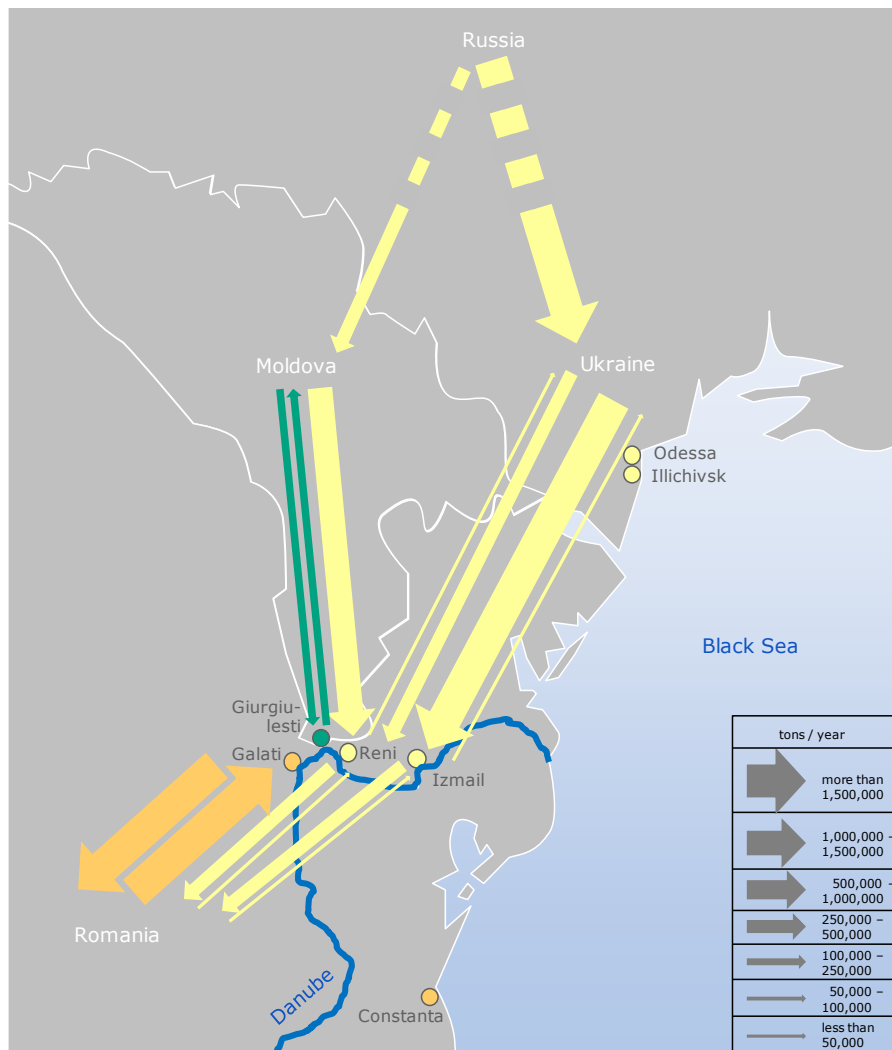
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Port	Giurgiulesti	Galati	Reni	Izmail
Free trade zone	+	+	+	-
Parking places for trucks	+	++	-	-
Winter harbor	-	+	+	-
Customs procedure for Moldovan transports	++	--	--	--

Source: Magazine Ports of Ukraine plus Feb 2011 (N° 103), the Consultant

One of the main advantages of Giurgiulesti Port Complex is that cargo landed here has to pass only Moldovan customs. In contrast, cargo shipped to any of the competitor ports destined for Moldova must first pass through Romanian or Ukrainian customs, and then again Moldovan customs. Two further main factors are obvious. First, Giurgiulesti has a competitive disadvantage because of the limited depth and the limited acceptable ship size compared to the neighbor ports. Second, it can be seen that Reni is the main competitor regarding the Moldovan hinterland area. To visualize the interaction in the port hinterland regions, the Consultant has developed the following map of transport flows.

Figure 7.2. Hinterland Flows Danubian Competitor Ports



Source: Handbook Ukrainian ports 2011, the Consultant



It shows the export excess for Izmil and Reni. Izmil has a 79.4% export share and the exports in Reni are 20%. The remaining volume of 80% in Reni is classified as transit volume mainly because the railway access for Reni is routed via Moldova. In consequence, even Russian transport volumes are partly routed via Moldova as transit cargo to Reni.

It is not expected that Giurgiulesti can handle relevant transit volumes from Ukraine or Russia because of the geographical detour. However, the Moldovan export volumes which are now routed via Reni are potential transport flows to be shifted to Giurgiulesti. In addition, imports and exports for Romania could be partly routed via Giurgiulesti Port Complex.

7.2. Analysis of Relevant Black Sea Ports

Regarding the loading and unloading of seagoing vessels, the Black Sea ports of Odessa, Iliciovsk and Constanta cannot be classified as direct competitors to the Danubian ports because they have direct access to the Black Sea and can serve bigger ship sizes up to Panamax size, ship size being limited mainly by the Bosphorus Strait. However, the Black Sea ports serve as hubs for feeder services to Reni, Giurgiulesti and Galati. Thus, the Danubian ports compete for the hinterland transports with the Black Sea Ports due to the same hinterland coverage. The following table compares the relevant Black Sea ports in their main parameters.

Table 7.3. Qualitative Analysis of Black Sea Ports

Port	Odessa	Iliciovsk	Constanta
Classification	Sea port	Sea port	Sea port
Cargo turnover (2010)	24.7 mln. t	15.0 mln. t	47.5 mln. t
Capacity (2010)	46 mln. t	32 mln. t	100 mln. t
Free capacity (2010)	46 %	53 %	52.5 %
TEU volume (2010)	351,568 TEU	301,508 TEU	556,694 TEU
Share (2010):			
- Import	- 18.4 %	- 25.1 %	- 32.3 %
- Export	- 40.1 %	- 46.7 %	- 34.1 %
- Transit	- 41.1 %	- 28.2 %	- 24.1 %
- Domestic	- 0.4 %	- 0.0 %	- 9.5 %
Major commodities (2010)	- Liquid oil / petroleum products (46.7 %) - Metals (16.2 %) - Containers (15.8 %) - Grain (9.7 %) - Ore (7.1 %) - Raw sugar (2.2 %)	- Petroleum products (9.6 %) - Ore (20.2 %) - Cereals (13.0 %) - Ferrous metals (17.2 %) - Trucks (1.2 %) - Containers (18.2 %)	- Cereals (25.4 %) - Oil products (23.9 %) - Metal products (5.4 %) - Coal, coke (6.3 %) - Ore / scrap (16.6 %) - Containers (12.4 %)
Min. depth at berth	11.50 m	7.50 m	8.00 m
Port area	141 ha	N/A	1,313 ha
Storage area	48.5 ha	60.3 ha	N/A
Free trade zone	Yes	No	Yes
Total berth length	8 km	6 km	30 km

Source: Magazine Ports of Ukraine plus Feb 2011 (N° 103), Constanta Port, the Consultant



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As can be seen above, the three investigated Black Sea ports taken together handle a volume 6 times higher than the volume of the ports of Galati, Reni, Giurgiulesti and Izmil. Besides the usual bulk commodities, all three Black Sea ports have successfully developed their container business.

7.3. SWOT Analysis

Beside the traffic forecast and the competitor analysis, the advantages and disadvantages for Giurgiulesti are summarized related to the following topics:

- Hinterland area for import/export
- Potential for transit flows
- Depth of port basin
- Extension possibilities
- Capacity
- Commodities
- Supply chain costs for feeder services
- Connection to railway network

Hinterland area for import/export:

Regarding the Moldovan hinterland area, Galati port does currently not compete with Giurgiulesti port. Even though Galati is located near to the Moldovan border and a wide gauge access exists in the port, the connection to Moldova is rather poor, both for rail and road. Furthermore there are extensive border procedures as Romania is an EU member country. Furthermore, no goods are transported to the Moldovan hinterland area from Izmil because Izmil is farther away from Moldova than Reni or Galati and the connection via road and rail is poor.

Regarding the Romanian and Ukrainian hinterland area there is no clear advantage to choose Giurgiulesti for serving Romania or Ukraine. These countries can thus be covered in the same manner via Izmil or Galati. This means that the strategy for Giurgiulesti must be to mainly concentrate on transports from and to the Moldovan hinterland.

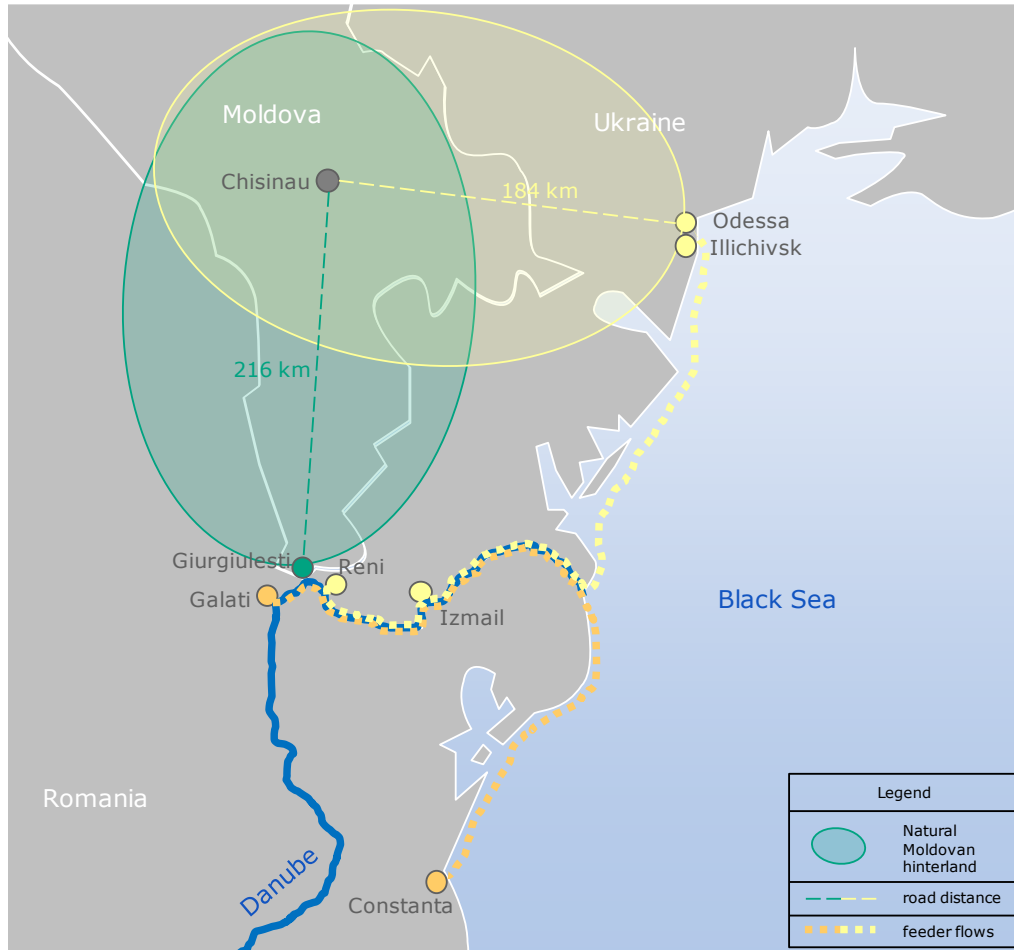
At present, only the port of Reni partly covers the Moldovan hinterland. This is reasonable as Reni is located directly at the Moldovan border and the customs examinations are easier than at the Romanian-Moldovan border. Another reason is that the railway line from Reni to the Ukrainian hinterland passes anyway through Moldova. In summary, Reni is a competitor for Giurgiulesti especially for grain handling, so the strategic target for Giurgiulesti must be to take over this share from Reni.

The ports of Odessa and Iliciovsk do not only serve as hubs for the Danubian ports, but they are also well located to serve the Ukrainian and Moldovan hinterland directly. As can be seen in the map below, the straight distance between Odessa and Chisinau is even shorter than the distance between Giurgiulesti and Chisinau.

In the SWOT analysis of the following chapter, it will be shown that not only the distance, but also other factors have to be considered, as for instance the price level, service quality and the available capacity.



Figure 7.3. Situation of Giurgiulesti in the Hinterland of the Relevant Black Sea Ports



Source: the Consultant

Potential for transit flows:

Regarding the geographical distances for transports, using the port of Giurgiulesti for transit transport via Moldova, e.g. to Ukraine or Romania or Russia does not constitute a clear benefit. The ports of Galati, Reni and also Odessa are located in a better position for handling these transit flows.

Giurgiulesti Port Complex could be able to import and export cargo for Romania as transit flow through Moldova. In this case Giurgiulesti would compete directly with Galati including the disadvantage of additional border procedures. Beside the potential for transit flows, the core business of Giurgiulesti Port Complex will be imports and exports for Moldova itself.

Depth of port basin:

The most obvious competitive disadvantage of Giurgiulesti is the lower depth of only 5 m at the general cargo, bulk and grain terminals. This limits the ship size to maximum 7,000 DWT. All competitor ports are able to handle sea-river vessels of 10,000 DWT. Especially for competitive feeder services to Black Sea ports, seagoing vessels are needed.



Danube Logistics has the possibility to increase the port frontage by 300 m with a depth of 7 m suitable for handling dry bulk and general cargo ships. The implementation of this terminal would enable GIFF to handle 10,000 DWT ships and thus to get connected to a higher league of ports. Especially for grain trading, much more opportunities would appear if bigger ports worldwide could be reached.

Extension possibilities:

The Giurgiulesti storage area directly at the quay wall is limited, but it still has capacity left. It must be stated that the current landscape profile is difficult to handle because of the slight slope towards the hills close to the berth area. However, a big advantage is the large free space in the Business Park of more than 55 ha. In this area, Giurgiulesti can provide long-term storage and other value added logistics services. This constitutes a unique selling point and a competitive advantage compared to the other Danube ports.

Capacity:

In the Ukrainian-Romanian-Moldovan border area, the 2009 economic crisis had more extensive impacts than in other European regions. The transport sector recovers slowly and will need a long time to achieve the pre-crisis level. Consequently, in relation to the total handling volume forecast for this region, the handling capacity is not expected to become a limiting factor in the next years. This means that Giurgiulesti Port must compete by other criteria (e.g. service quality, transparency, tariff level, value added services like customs procedures etc.).

Commodities:

Besides oil, grain, gravel and sand, suitable cargo types for Giurgiulesti include cement, bricks, fertilizers or frozen cargo. On the other hand, commodities like coal or scrap are less suitable for the port of Giurgiulesti depending on the expected market demand for these branches.

A natural risk of a port linked with Moldova is the limited number of different cargo types. Thus, the port of Giurgiulesti directly depends on a few branches. This implies that if one sector struggles it would be difficult to compensate the handling volumes by other types of goods.

Actually there is no reliable forecast for passenger demand available. The competitor ports have partly established services for river cruise ships. The service for passengers by ferry, or more realistically by cruise ships, could become a niche for Giurgiulesti state port.

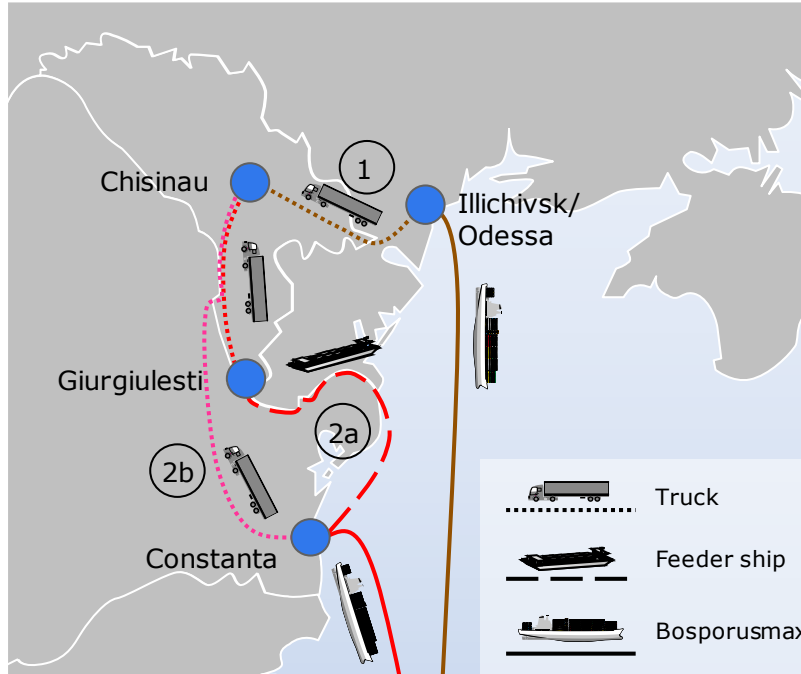
Comparison of supply chain costs for feeder services

In the middle of 2012, a new container feeder service has been established between Giurgiulesti and Constanta.

The market position of this feeder service is evaluated by considering a 20' container arriving in the Black Sea from the Far East and destined for Chisinau. A transport chain via Giurgiulesti (no. 2a) is in competition with a direct on-carriage by truck from Constanta (no. 2b) or Odessa/Iliciovsk (no. 1) to Chisinau. The different possible transport chains are illustrated in the figure below.



Figure 7.4. Overview of Transport Chains from Far East to Chisinau



Source: the Consultant

Odessa and Illiciovsk have the same natural (Moldovan) hinterland as Giurgiulesti. For example, the road distance between Odessa and Chisinau (184 km) is shorter than Giurgiulesti – Chisinau (216 km). Furthermore, there is a convenient infrastructure both for road and rail between Odessa/Illiciovsk and Moldova. Anyhow, the problematic border procedures are a critical factor. Moreover, the THC is higher in Odessa and additional charges must be added like a port-forwarding fee. Thus, Giurgiulesti can serve as a bypass alternative to avoid transports through Transnistria and higher handling costs.

The handling in Constanta is less expensive than in Odessa, but the on-haulage distance by truck to Chisinau is longer (approx. 450 km) and costs about 800 EUR/TEU to 1,000 EUR/TEU. However, the costs for the feeder service and for the additional handling in Giurgiulesti are economized. When comparing the costs, it is obvious that all transport chains are almost in the same price range (see next table). Slight market fluctuations and the quality of the service can turn the balance in favor of one transport chain or another.

Table 7.4. Comparison of Transport Chain Costs

Supply chain no.	THC seaport	Feeder service	THC Giurgiulesti	On-carriage by truck	Total costs
1 	Odessa: 200 EUR/TEU	-	-	700-900 EUR/TEU	900-1,100 EUR/TEU (13,500-16,500 MDL/TEU)
2a 	Constanta: 160 EUR/TEU	160-250 EUR/TEU	160 EUR/TEU	400-500 EUR/TEU	880-1,070 EUR /TEU (13,200-16,050 MDL/TEU)
2b 	Constanta: 160 EUR/TEU	-	-	800-1.000 EUR/TEU	960-1,160 EUR /TEU (14,400-17,400 MDL/TEU)

Source: the Consultant



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From the end of 2011 until the middle of 2012, another feeder service between Giurgiulesti and Istanbul was available. This service had to be abandoned because of developments on the global container market. Due to high demand Istanbul became such a favored destination that the shipping companies charged premium rates. Hence, a transport chain from the Far East via Istanbul and Giurgiulesti to Chisinau became much more expensive than a transport via Constanta or Odessa. Thus, the Giurgiulesti feeder service did not compete with truck services from Istanbul, but with the Bosphorusmax container vessels navigating on the Black Sea and calling at Constanta or Odessa.

This case study shows impressively the changes within the container transport flows. The market price depends on factors related to international container trade, and most of them cannot be influenced by Giurgiulesti port management at all.

Other potential feeder destinations can be the Georgian ports of Batumi and Poti. Georgia can fulfill an important position as transit country for Armenia and Azerbaijan. Also the industrial development of Georgia itself will lead to an increase of container volumes.

Connection to railway network

Many inland ports all over Europe have been developed as tri-modal transshipment hubs. The river-side handlings often represent only a small part in the modal split. Instead, river ports become important hubs in rail/rail or rail/road transshipment.

For example, in the German Danube port of Regensburg, the rail share is 28.7% compared to a barge share of 19.7%. Austrian Danube ports also transship more volume via the railway than the river. Accordingly, the Port of Giurgiulesti can gain additional volumes by developing the rail connections.

Concerning railway operation, another advantage of Giurgiulesti Port Complex is the fact that the port is located at the border between the standard gauge and the wide gauge rail network. Although Giurgiulesti Port cannot be compared to large gauge change facilities on the EU-external border crossings, the objective must be to connect all port areas to both gauge systems. Therefore some last railway sections have to be completed by the state, both for standard and wide gauge. This will be a unique feature in the region – only Galati is connected to both gauge systems, while Reni and Izmail do not have a mixed-gauge railway line.

By offering access for both railway gauges, Giurgiulesti can attract more transit volumes from and to Romania and other EU countries. Furthermore, rail transportation can become more important for import and export flows between Moldova and Western Europe.

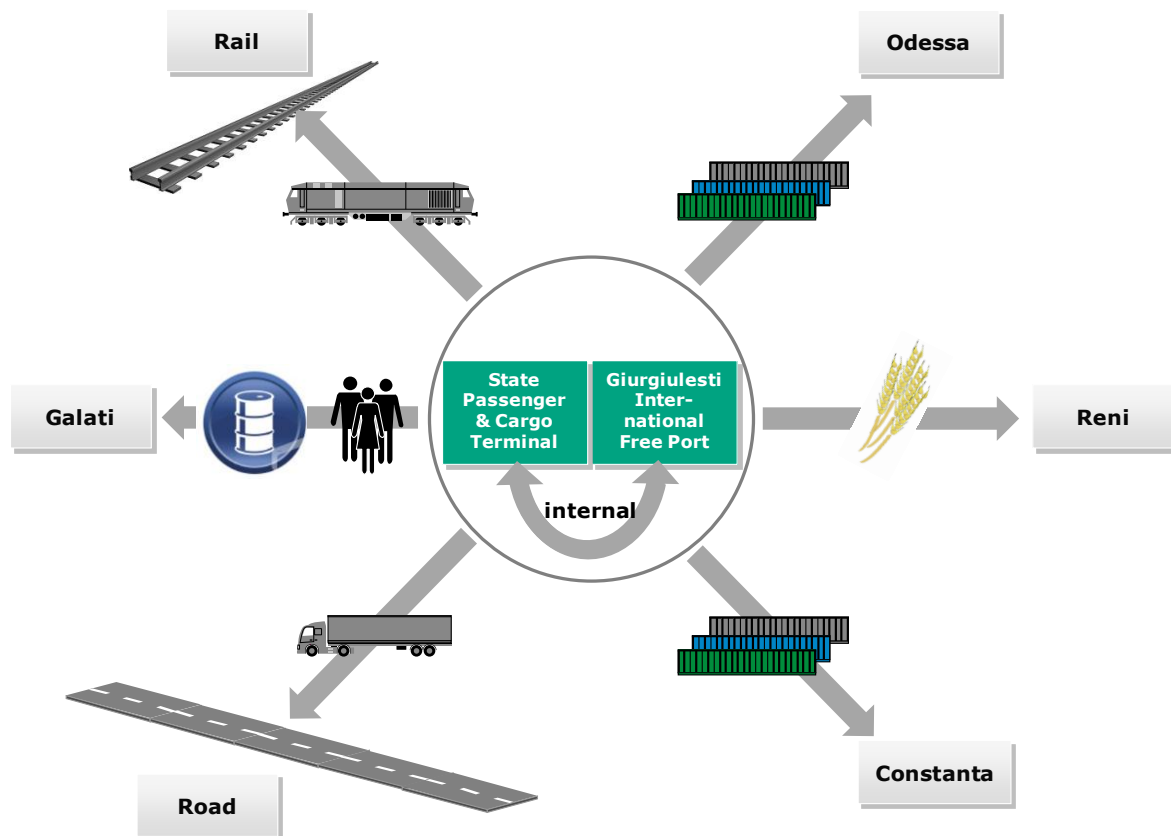
Weaknesses, Threats:

The previous analysis about the competitor ports and different aspects of supply chain reveals the range of interactions for Giurgiulesti Port Complex. For gaining handling volumes the port is not only in competition with other ports like Reni but also with other transport modes like truck on-haulage from Constanta. The type of competition differs by commodity as for example Reni is the biggest competitor regarding grain volumes.

The different aspects in competition are illustrated in the graph below.



Figure 7.5. Giurgiulesti Port Complex in Competition to other Ports and other Transport Modes



Source: the Consultant

Strengths and Opportunities:

The Naval Transport Service and the private port management of the port must get the highest possible benefit out of Giurgiulesti Port Complex by exploiting its main advantages:

- Private port management enables the following advantages
 - a higher service level;
 - high level know-how management;
 - more flexibility in strategic decisions;
 - faster reaction times.
- Cross selling potentials
 - Besides the handling services in the port, other business activities like gasoline distribution for Moldova are linked to the development of the port. This provides, among other factors, a long term perspective for turnover.
- Bypass alternative for Transnistria
 - Instead of using e.g. rail or road transport between the Odessa region and Chisinau, Giurgiulesti port offers a barrier-free green corridor avoiding time-consuming border formalities.
- Transit country



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- Even if it is not obvious at first glance, there is a chance for gaining some transit flows e.g. towards Romania. It will not become the main share in the future, but Giurgiulesti Port Complex can certainly cover parts of this transit volume to complete its portfolio.
- Comparatively low labor costs
 - As one additional advantage the personnel costs in Moldova are below the salary level in the competitor ports Galati and Reni. Compared to the Chisinau region, the labor costs in Giurgiulesti are even below the average level within Moldova.
- Railway connection to normal gauge
 - The upcoming normal gauge connection will be a key strength and opportunity (Reni and Ismail do not have it a mixed-gauge railway line). Building on this feature, Giurgiulesti Port Complex can be developed towards an important regional tri-modal logistic center.
- Direct access to international trade network
 - Giurgiulesti Port Complex can become a highly important success factor that may facilitate imports, exports and transit flows for Moldova. The main reason therefore is the specific competitive advantage that Moldova can participate directly in global trade via Giurgiulesti Port Complex. Compared to the other landside border crossing points, the number of to be passed borders is for many destinations much lower when using Giurgiulesti Port Complex.



PART B - STRATEGIC RECOMMENDATIONS

8. FORMULATION OF STRATEGIC APPROACH

After investigating all aspects such as the legal framework, infrastructure conditions, the competitive situation and market demand, the general logistics strategy for the port sector is recommended in the following sections:

- General strategy for port and maritime sector;
- Strategy for improvement and maintenance of hinterland infrastructure;
- Strategy for inland waterway transportation;
- Strategy for state passenger and freight terminal;
- Strategy of Moldovan state for Giurgiulesti International Free Port (GIFP);
- Strategy for avoiding monopolies;
- Recommendation for maintenance dredging;
- Strategy of GIFP private operator ICS Danube Logistics SRL;
- Strategy for network of logistics zones.

General strategy for port and maritime sector:

The main task of the state is to provide and to maintain the infrastructure required for access to the Giurgiulesti Port Complex and to guarantee transport capacity to the hinterland. In order to enable private port operators to perform their operation in a successful way, the Moldovan Government shall be responsible for providing the most optimal framework by establishing efficient procedures for import and export via Giurgiulesti Port Complex. The Moldovan state shall concentrate on its regulatory role, which includes the following tasks:

- Controlling of ship navigation;
- Providing customs services;
- Enabling import/export procedures on an international level;
- Guaranteeing security standards;
- Ensuring maintenance dredging or port access;
- Efficient entry and exit of vessels and crew members.

Strategy for improvement and maintenance of hinterland infrastructure:

It is recommended to concentrate first on the road and rail network and to fulfill all state tasks for improvement and maintenance of the needed hinterland infrastructure.

- Construction of normal gauge and wide gauge rail connections to GIFP;
- Maintenance of railway lines between Giurgiulesti and Chisinau and normal gauge connection to Romanian border;
- Project for rehabilitation of M3 road;
- Establishment of the infrastructure required for emergency services.

Strategy for inland waterway transportation:

Although the inland waterway strategy paper of MoTRI describes general targets for the reactivation of the Moldovan inland waterways, there is a lack of a detailed demand analysis. In addition, the required investments are not shown.



Without the volume forecast related to a profitability calculation the mentioned measures cannot be realized. Although river transportation is the appropriate mode for bulk cargo, there is a need to prove that any investment in the rehabilitation of the Prut river makes sense with regard to the six existing transport routes between Giurgiulesti and the regions of Cahul and Chisinau (2 Moldovan railway lines, 1 Romanian railway, 2 roads and one river).

Due to the lack of existing studies about the actual navigability, the measures required for reinforcement and the related investments, the Consultant performed a basic demand and feasibility analysis (chapter 5.3). The preliminary result shows that the demand is not sufficient and the profitability is too low to compete with other transport modes. Reactivating navigation on the Prut River can thus not be recommended at this stage. A feasibility study and an environmental study are a prerequisite for making decisions about investments for changes to the river bed, for the purchase of barges and for inland port infrastructure.

Similarly, a feasibility study and an environmental study need to be done for the Dniester River before deciding about investments. As currently the Government of Moldova has no jurisdiction over the major part of the Dniester River, no strategic recommendations can be given at the moment. The legal circumstances have to be clarified before and the political situation must be stable before any investment for the Dniester River can be made.

Strategy state passenger and freight terminal:

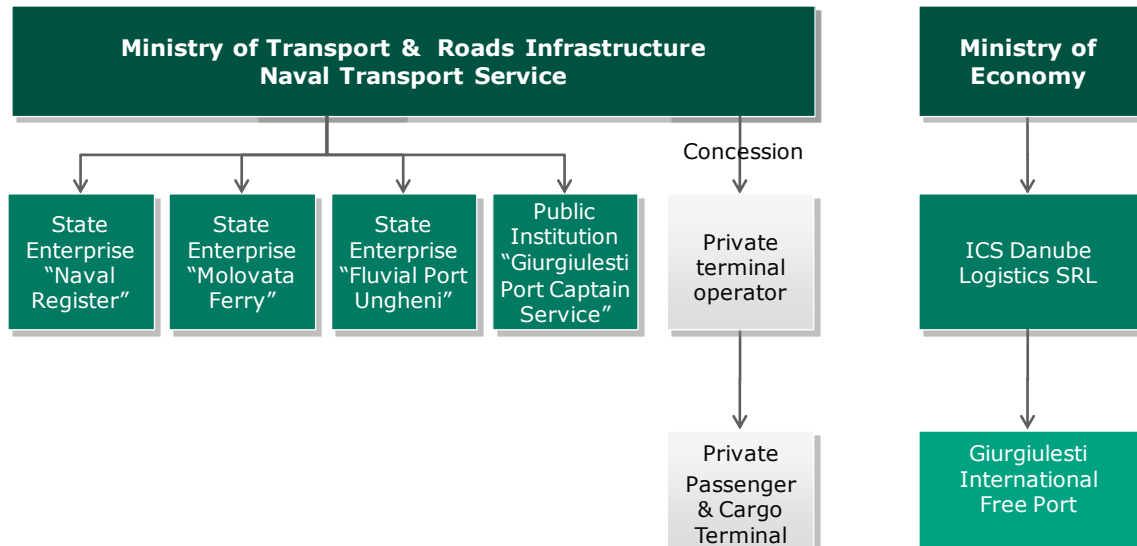
The parallel operation of the passenger/cargo terminal by a state-owned company and the private operation of the other terminals constitute a structural weakness. The state company competes with the General Investor, mostly because it also handles bulk and general cargo on the passenger terminal. In general, competition is highly needed not only between other ports but also within Giurgiulesti Port, but the question must be raised if the Moldovan state itself shall really engage in terminal operation business.

Alternatively the state can tender a concession for the operation of the current state passenger/cargo terminal. This would lead to internal competition within the port among the different private operators. The service for passengers by ferry, or, more realistically, by cruise ships, could become a small niche for Giurgiulesti state port. The demand must be analyzed by a market research study including the competitive situation e.g. with Galati port.

The state itself shall concentrate on its landlord function providing the terminal infrastructure. It must be clearly stated that this alternative concession model is only suggested for the current state passenger/cargo terminal. The existing agreement with Danube Logistics for GIFP will certainly not be influenced by this alternative at all.



Figure 8.1. Alternative Organization Model Port Sector - Suggestion by Consultant



Strategy of the Moldovan state for Giurgiulesti International Free Port (GIFP):

The legal conditions for GIFP are regulated in the special law N° 8-XV from 17.02.2005 as well as in the host agreement with the private investor. In order to facilitate the successful development of Giurgiulesti Port Complex, the Moldovan state needs to fulfill its outstanding commitments:

- Leasing of the remaining 65 ha of land to develop the planned logistic center and business park;
- Completion of additional wide gauge rail connection to port area of GIFP;
- Completion of normal gauge rail connection which allows the private investor to finish the mixed gauge rail terminal;
- Maintenance of Prut fairway up to Giurgiulesti state passenger and freight terminal;
- Maintenance of networks for electricity, gas and telecommunication at Giurgiulesti Port Complex.

Strategy for avoiding monopolies:

It is of utmost importance to avoid any investment which could support monopolies. In this context it is emphasized again that every logistics activity at Giurgiulesti Port Complex is in competition with other transport modes and with other ports outside Moldova as described in detail in the competitive analysis and the SWOT Analysis.

The special law Nr. 8-XV on Giurgiulesti International Free Port from 17th February 2005 provides a list of preferential treatments regarding customs, tax regulation and exemption from certain fees. These regulations had been absolutely necessary to attract foreign investments and to provide the basis for the positive development of Giurgiulesti Port Complex.

The conditions offered by the Government to the General Investor must be regarded as useful incentives for the start-up phase. By this the main target to attract foreign investment had been achieved. Furthermore the implementation of special law Nr. 8-XV has led to creation of jobs at Giurgiulesti Port. Other targets of the conditions offered by the Government are the development of infrastructure facilities and the overall increase in economic activity.



The Consultant evaluates the offered conditions as a positive instrument during the development phase. The limitation of the free economic zone status until 2030 is necessary. One disadvantage of this status can be that resistance about stopping the protections could occur in later years.

The model of Free Trade Zones has shown worldwide to be beneficial both for the importers and exporters, as these zones are developed to reduce labor cost and tax related expenditures. The idea of free trade zone is not really favored within the European Union because there is a certain danger that free trade regulation could lead to protective measures. But there exist trade between EU-countries and other countries worldwide which established also free trade zones.

Regarding the avoiding of monopoly situation it has to be noted that the incentives are not only restricted to the General Investor but also apply to any other company being settled in the business park or handling goods in GIFP. As can be seen there are already different terminal operators, e.g. Trans-Oil Group acting in GIFP beside the General Investor. Every shipping agency is free to approach Giurgiulesti Port Complex and the tariffs are officially published.

GIFP acting as a Port Authority has a high interest to attract third party terminal operators and private companies to settle in the business park. Additionally clients can use the service of the state passenger and freight terminal as another alternative. Open competition within the port is thus guaranteed in addition to the existing competition with other ports.

One crucial point for successful port development is the hinterland connection, especially the modal split of railway transportation. In the past, there have been several examples of too high and in-transparent railway tariffs, e.g. higher transit tariffs had been charged for national transports. To avoid a monopoly in the distribution chain, the Government of Moldova has the obligation to push the urgently needed railway reform. A railway tariff policy is required to ensure transparent and non-discriminatory tariffs in port hinterland transportation (details are described in railway report A4 and B4).

Recommendation for maintenance dredging:

A very common practice for the responsibility of maintenance dredging in ports worldwide is based on a diversification by different sections:

1. Fairway and port access is usually under the responsibility of the state or the Naval Transport Service Department. One reason is that the port access is public and can be used by different companies for entering and leaving the port. Another reason is that the port access can cover a long distance (e.g. 130 km in the Port of Hamburg) resulting in high dredging costs. The Naval Transport Service Department is free to commission a third party with carrying out the dredging works;
2. The port basin maintenance itself is a typical task of the port authority. The reason for this is again that all terminal operators within the port use the port area. If every terminal operator dredged only in front of their own berth, this would be a waste of resources. It is operationally more feasible to keep this work in the responsibility of one company. To cover the costs for maintenance dredging in the harbor basin, the Port Authority can either receive subsidies from the state or can charge certain fees from the terminal operators in the port.

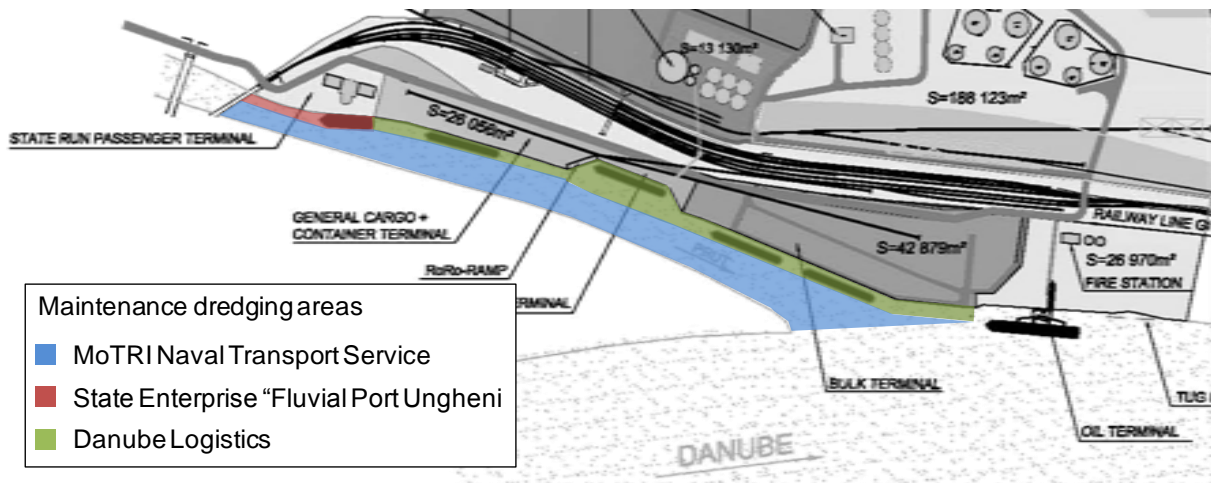


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In the case of Giurgiulesti Port Complex the different sections are very close to each other. This makes it difficult to differentiate between the sections, but it does not change the general responsibilities described above. Danube Logistics is acting as a Port Authority for the Giurgiulesti International Free Port and is responsible for the maintenance of the berth area but only in this section. It is not the task of GIFP port authority to maintain the access for the state passenger and freight terminal. The figure below shows the different sections and responsibilities:

Figure 8.2. Sections for Maintenance of River Bed and Port Area



Source: the Consultant

The Consultant recommends that the state fulfills its duties for maintenance dredging of the port access and the river bed up to the state passenger and freight terminal. The Naval Transport Service Department shall order this service by Danube Logistics. By this, Danube Logistics can take care of all the dredging works in the Port area but they shall receive a certain fee from the Naval Transport Service Department and from the operator or the state passenger and freight terminal. The fee must be calculated by a fair formula, e.g. per berth meter of each party.

Strategy of GIFP private operator ICS Danube Logistics SRL:

To continue the positive development into a major logistic center, further installations are either already under construction or in the planning phase:

- Mixed Gauge Rail Terminal;
- The rail terminal will offer the possibility to handle oil products as well as dry cargo. The estimated transshipment volume of oil products amounts to more than 120,000 tons per annum. Mobile cranes, wheel-loaders, forklifts and reach stackers enable the handling of bulk, general cargo and containers. An additional open area of 1.6 ha is suitable for temporary storage of several cargos;
- Ro-Ro Ramp;
- Grain and general cargo terminal with a minimum water depth of 7 m enabling the port to handle 10,000 DWT ships and to connect a higher number of destination ports worldwide;
- Container Terminal – Phase II;
- Production buildings (e.g. terminal project);
- Warehouse Complex;
- Additional office buildings;
- Extension of the Business Park.



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The private operator is targeting a handling volume of 1 - 1.5 mln t in the next ten years. The prospective development shall be preceded by the settlement of logistics providers and industrial clients. The started container business shall be kept stable in order to further increase this high value logistics business and to develop the Black Sea container feeders.

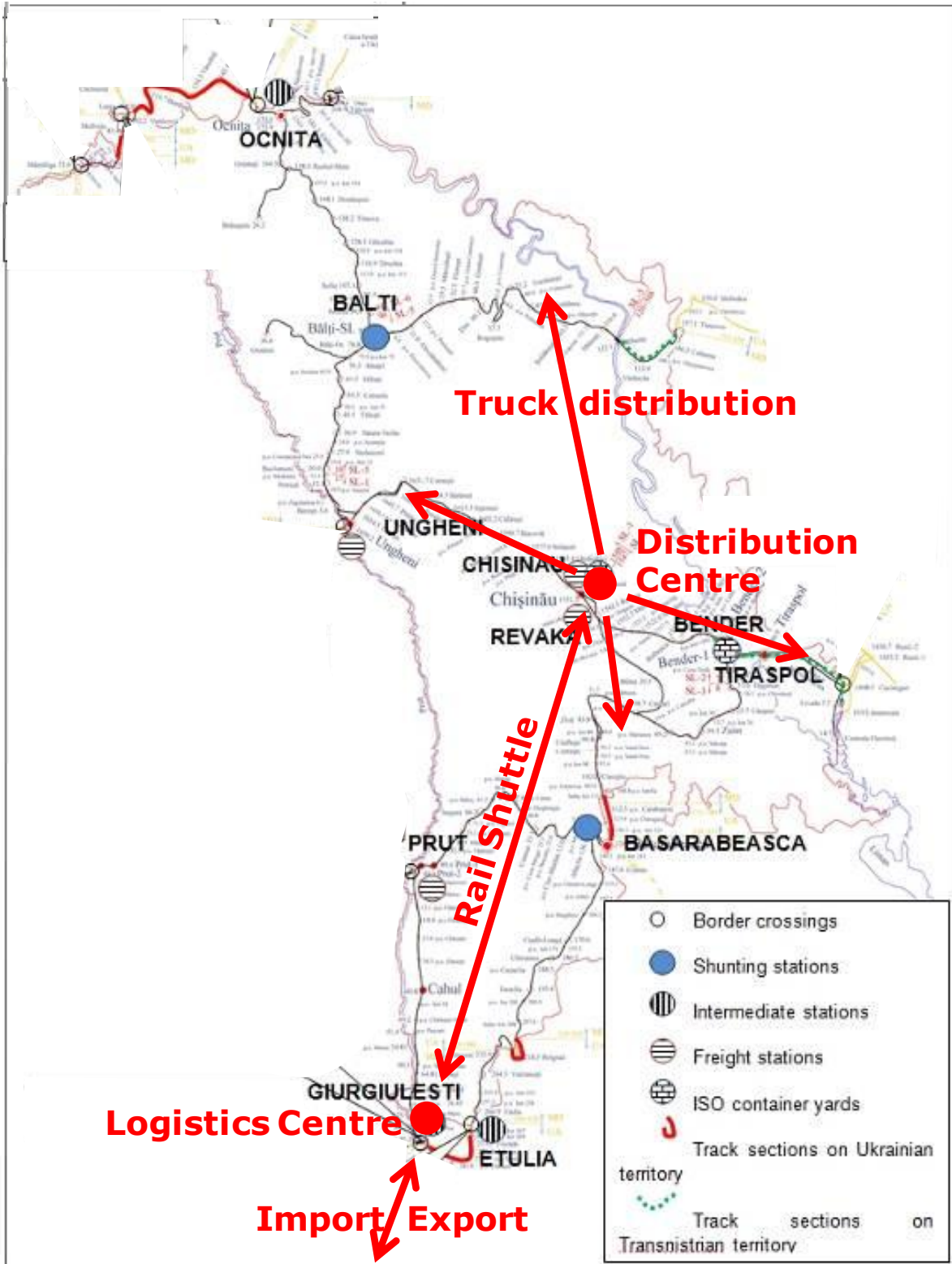
Strategy for network of logistics zones:

As described in the A2 Rail report, the target of the logistics strategy shall be to establish a container rail shuttle between Giurgiulesti and Chisinau in the medium term. One requirement for this is the implementation of the railway structural reform to guarantee transparent tariffs (see A2 Rail report).

The logistics zone in Giurgiulesti is an important factor for stimulating the handling volumes for the port, especially for increasing the share of container volumes including industrialized goods. To establish a cost effective national supply chain, the Consultant recommends implementing a second logistics center close to Chisinau. It should be dedicated to distribution purposes (mainly by trucks) and could also serve as a City Logistics Center. The following map illustrates the scheme of logistics centers:



Figure 8.3. Rail Shuttle between Logistics Centers Giurgiuilesti - Chisinau



Source: the Consultant



9. IDENTIFICATION OF REQUIRED INVESTMENT PROJECTS

Based on the previous analysis and the formulated strategic approach a list of projects to be done is identified. These projects can contain construction of new infrastructure, modernization or maintenance of existing infrastructure, but also improvements of management structures or the implementation of safety and environmental measures. The suggested investments are divided into two groups:

- Investments into maritime and port sector;
- Investments into other sectors related to maritime sector.

9.1. Investments into Maritime and Port Sector

Priority	Projects / Investments for Maritime/Port Sector
high	The Government needs to complete the wide gauge connection leading to the terminals on the Danube and Prut. So far there is only a wide gauge rail connection to the business park, which is insufficient for the development of GIFP.
high	The Government also has to complete the overdue normal gauge rail connection to GIFP's business park, which will be critical for the attraction of transit volume to and from the EU, Moldova's largest trading partner.
high	Completion of normal gauge rail connection to enable the private investor to realize the construction of a mixed-gauge rail terminal.
high	Ensuring maintenance dredging for port access up to Giurgiulesti state passenger and freight terminal based on the existing agreements.
medium	Organizing an international tender for a concession to operate state passenger and cargo terminal by a private company.
medium	Leasing of remaining 65 ha of land to develop the planned logistic center and business park.
low	Launch a feasibility study for reactivation inland waterway transport on River Prut.
low	Launch a feasibility study for reactivation inland waterway transport on River Dniester.
low	Launch market research study demand for passengers cruise ships services in Giurgiulesti and competition with Danubian ports.



Each investment project is characterized in detail in the following:

Project Title	Completion of normal and wide gauge connections to GIFP business park and port terminals
Situation	Completion of railway connections is agreed but not yet realized by the Government
Main goals of the project	Enable private investor to finish mixed gauge rail terminal
Scope of work	<ul style="list-style-type: none">Complete the wide gauge connection leading to the terminals on the Danube and PrutComplete the overdue normal gauge rail connection to GIFP's business parkCompletion of normal gauge rail connection to the mixed gauge terminal
Business structure	No special business units should be set up
Functional units	The project must be undertaken by the responsibility of MoTRI
Pre-conditions of realization	No specific pre-conditions, the agreements for realization do already exist
Implementation period	The projects shall be implemented in the short term
Implementation location	Port of Giurgiulesti
Estimated investment value	> 200,000 EUR
Priority	High

Project Title	Ensuring maintenance dredging for port access up to Giurgiulesti state passenger and freight terminal based on the existing agreements
Situation	Responsibilities for maintenance dredging are actually not fulfilled completely by MoTRI
Main goals of the project	Enable permanent access to GIFP and to state passenger and freight terminal
Scope of work	<ul style="list-style-type: none">Ongoing dredging of river bed up to state passenger and freight terminal
Business structure	No special business units should be set up
Functional units	The project must be undertaken by the responsibility of MoTRI
Pre-conditions of realization	No specific pre-conditions, the agreements for realization do already exist.
Implementation period	The projects shall be implemented in the long term
Implementation location	Port of Giurgiulesti
Estimated investment value	Annual costs for maintenance dredging depending on depth and fluvial stream
Priority	High



Project Title	Launch Feasibility Studies for reactivation of inland waterway transportation
Situation	The actual plans for reactivation are too general and are not based on a demand analysis or on an investment calculation.
Main goals of the project	Provide the decision basis for the Government and the Donors about the feasibility and profitability of reactivating the river navigation. Definition of preferred sections and inland ports.
Scope of work	<ul style="list-style-type: none"> • Feasibility study for reactivation of inland waterway transport on Prut river • Launch a feasibility study for reactivation of inland waterway transport on Dniester river • Tender a market research study demand for passengers cruise ships services in Giurgiulesti and competition with Danubian ports
Business structure	No special business units should be set up
Functional units	The project must be undertaken by the responsibility of MoTRI
Pre-conditions of realization	Preparation of the scope for the studies and provision of the needed budget.
Implementation period	The projects shall be implemented in the short term
Implementation location	Prut and Dniester rivers
Estimated investment value	The investment depends on the result of the tender process, estimation is < 500,000 EUR
Priority	Low

Project Title	Organizing an international tender for a concession to operate state passenger and cargo terminal by a private company
Situation	The state is involved in the terminal handling business via its 100% affiliate company
Main goals of the project	Enable private company to operate the passenger and freight terminal in order to guarantee free competition within Giurgiulesti Port Complex
Scope of work	<ul style="list-style-type: none"> • Analyze the actual agreement between State and terminal operator • Define TOR for tendering the concession • Launch international tender and perform negotiation process with bidders
Business structure	No special business units should be set up
Functional units	The project must be undertaken by the responsibility of MoTRI
Pre-conditions of realization	Analysis of existing legal agreement
Implementation period	The projects shall be implemented in the short term
Implementation location	Port of Giurgiulesti
Estimated investment value	No investments for infrastructure needed for the privatization tender.
Priority	Medium



9.2 Investments into Other Sectors Related to the Maritime Sector

Project Title	Maintenance of railway lines between Giurgiulesti and Chisinau and normal gauge connection to Romanian border
Situation	For detailed description see chapter rail strategy
Priority	high

Project Title	Maintenance of networks for electricity, gas and telecommunication to Giurgiulesti Port Complex
Situation	No further analysis done within this report
Priority	high

Project Title	Rehabilitation of railway line Giurgiulesti – Cahul;
Situation	For detailed description see chapter rail strategy
Priority	medium

Project Title	Implementation of distribution logistics center close to Chisinau
Situation	For detailed description see chapter rail strategy
Priority	medium

Project Title	Project for rehabilitation of M3 road
Situation	For detailed description see chapter road strategy
Priority	medium