



ЕВРОПЕЙСКИ СЪЮЗ  
ЕВРОПЕЙСКИ ФОНД ЗА РЕГИОНАЛНО РАЗВИТИЕ  
ИНВЕСТИРАМЕ ВЪВ ВАШЕТО БЪДЕЩЕ!



РУМЪНСКО ПРАВИТЕЛСТВО



БЪЛГАРСКО ПРАВИТЕЛСТВО



# **JOINT STRATEGY FOR IMPROVEMENT OF NAVIGATION SAFETY ON THE LOWER DANUBE FOR THE PERIOD 2019 – 2025**

**May 2018**

---

**[www.interregrobg.eu](http://www.interregrobg.eu)**

The content of this material does not necessarily reflect the official position of the European Union.

# Contents

<b>INTRODUCTION .....</b>	<b>9</b>
<b><u>1. ASSESSMENT OF THE STATE OF WATERWAY TRANSPORT INFRASTRUCTURE ON THE DANUBE RIVER IN THE ROMANIA-BULGARIA CROSS-BORDER REGION.....</u></b>	<b><u>10</u></b>
1.1. LEGAL FRAMEWORK .....	10
1.1.1. LEGAL FRAMEWORK IN BULGARIA.....	10
1.1.1. LEGAL FRAMEWORK IN ROMANIA.....	11
1.2. GENERAL CHARACTERISTICS AND USE OF WATERWAY TRANSPORT INFRASTRUCTURE ON THE DANUBE RIVER IN THE ROMANIA-BULGARIA CROSS-BORDER REGION .....	12
1.3. STATE OF PORT INFRASTRUCTURE IN THE CROSS-BORDER REGION .....	20
1.4. CONNECTIVITY OF THE REGION THROUGH LAND TRANSPORT INFRASTRUCTURE .....	21
1.4.1. BORDER INFRASTRUCTURE BETWEEN BULGARIA AND ROMANIA .....	24
1.4.2. BORDER-CROSSING INFRASTRUCTURE ON THE BULGARIA-ROMANIA BORDER .....	26
1.5. STATE OF THE WATERWAYS AND TRANSPORT ON THE DANUBE RIVER IN ROMANIA AND BULGARIA .....	34
1.5.1. LEGAL AND ORGANISATIONAL FRAMEWORK FOR MAINTENANCE OF THE NAVIGATION ON THE DANUBE RIVER .....	37
1.5.2. WATERWAY DIMENSIONS .....	39
1.5.3. CHARACTERISTICS OF THE NAVIGATION CONDITIONS .....	40
1.5.4. PROBLEMS IN THE CONSTRUCTION AND MAINTENANCE OF WATERWAY TRANSPORT INFRASTRUCTURE .....	45
1.5.5. SOURCES FOR FINANCING THE CONSTRUCTURE OF WATERWAY TRANSPORT INFRASTRUCTURE IN THE CROSS-BORDER REGION .....	47
1.5.6. FUNDING OF PORT INFRASTRUCTURE THROUGH CEF .....	67
<b><u>2. STATE OF THE NAVIGATION SYSTEM IN THE ROMANIA-BULGARIA CROSS-BORDER REGION ..</u></b>	<b><u>72</u></b>
2.1. INFRASTRUCTURE FOR PROVISION OF RIVER INFORMATION SERVICES IN BULGARIA .....	73
2.2. ESTABLISHMENT OF RIVER INFORMATION SYSTEM IN ROMANIA .....	78
2.3. INSTITUTIONS RESPONSIBLE FOR PROVIDING NAVIGATION SAFETY IN BULGARIA .....	87
2.4. INSTITUTIONS RESPONSIBLE FOR IMPROVEMENT OF NAVIGATION SAFETY IN ROMANIA .....	91
<b><u>3. NAVIGATION SAFETY IN THE CROSS-BORDER REGION ROMANIA-BULGARIA .....</u></b>	<b><u>94</u></b>
3.1. NAVIGATION SAFETY PROBLEMS IN THE ROMANIA-BULGARIA CROSS-BORDER REGION AND THEIR OVERCOMING THROUGH THE JOINT EFFORTS OF THE TWO COUNTRIES .....	94
3.2. RIVER TRANSPORT ACCIDENTS IN THE CROSS-BORDER REGION .....	96
3.3. NAVIGATION RISK ASSESSMENT .....	98

<b>4. SWOT ANALYSIS OF WATERWAY TRANSPORT INFRASTRUCTURE IN THE CROSS-BORDER REGION .....</b>	<b>106</b>
<b>5. VISION, MISSIONS AND STRATEGIC GOALS, INVESTMENT PRIORITIES AND OPERATIONAL OBJECTIVES.....</b>	<b>108</b>
<b>6. ACTION PLAN .....</b>	<b>110</b>
6.1. ACTIVITIES AND EXPECTED RESULTS	110
6.2. INDICATIVE FINANCIAL FRAMEWORK	113
6.3. RISK MANAGEMENT MEASURES	115
6.4. MEASURES TO INCLUDE THE RESPONSIBLE AUTHORITIES	120
6.5. MEASURES FOR OPTIMISATION OF WATERWAYS IN THE CROSS-BORDER AREA	121
6.6. PERFORMANCE MONITORING AND EVALUATION MECHANISM	121
<b>7. RECOMMENDATIONS .....</b>	<b>125</b>
<b>REFERENCE LIST .....</b>	<b>126</b>

## LIST OF ABBREVIATIONS

<b>AGN</b>	Agreement on Main Inland Waterways of International Importance
<b>CN APDF SA Giurgiu</b>	National Company “Administration of the Danube River Ports” – S.A. Giurgiu
<b>CN APDM SA Galați</b>	National Company “Administration of the Danube River Ports” – S.A. Galați
<b>ERI</b>	Electronic ship reporting
<b>EUSDR</b>	The EU Strategy for the Danube Region
<b>INEA</b>	The Innovation and Networks Executive Agency created by the European Commission
<b>Inland ECDIS</b>	Visualisation of electronic charts
<b>LNWL</b>	low navigable water level
<b>NRDMS</b>	National Reference Data Management System
<b>NtS</b>	Notices to Skippers
<b>NtSNtS</b>	Notices to Skippers
<b>RIS</b>	River Information Services
<b>RoRIS</b>	Romanian River Information System
<b>SWOT analysis</b>	Strengths, weaknesses, opportunities and threats analysis
<b>TEN-T</b>	Trans-European Transport Network
<b>Viadonau</b>	Donau-Österreichische Wasserstraßen-Gesellschaft MBH
<b>VTMIS</b>	Vessel Traffic Management Information System
<b>VTT</b>	Vessel Tracking and Tracing system
<b>WAMS</b>	Waterway Asset Management System
<b>WMMS</b>	Waterway maintenance management system Wasserstraßen Management System
<b>AIS</b>	Automatic Identification System
<b>MIGA</b>	Multilateral Investment Guarantee Agency
<b>GNI</b>	Gross National Income

<b>BULRIS</b>	Telecommunication infrastructure of the river information system in the Bulgarian part of the Danube River
<b>SEPI</b>	State Enterprise “Port Infrastructure”
<b>EIB</b>	European Investment Bank
<b>ESIF</b>	European Structural and Investment Funds
<b>EFSI</b>	European Fund for Strategic Investment
<b>MSIWPARB</b>	Maritime Space, Inland Waterways and Ports Act of the Republic of Bulgaria
<b>EAMA</b>	Executive Agency “Maritime Administration”
<b>IDA</b>	International Development Association
<b>IBRD</b>	International Bank for Reconstruction and Development
<b>CEF</b>	Connecting Europe Facility
<b>SMEs</b>	Small and medium enterprises
<b>MTITC</b>	Ministry of Transport, Information Technology and Communications
<b>IFC</b>	International Finance Corporation
<b>ICSID</b>	International Centre for Settlement of Investment Disputes
<b>PMA</b> s	Port management authorities
<b>OSC</b>	Operational Suitability Certificate
<b>OSC</b>	Operational Suitability Certificate
<b>PHARE CBC</b>	PHARE Cross-border Cooperation

## LIST OF TABLES

Table 1. Number and carrying capacity of vessels in Bulgaria and Romania _____	14
Table 2. Modal split of freight transport by land, % of tkm for 2015 _____	17
Table 3. Loaded and unloaded cargo in Bulgarian river ports by destination, thousand tonnes _____	19
Table 4. Infrastructure border crossing facilities between Bulgaria and Romania _____	26
Table 5. Parameters of the main categories of inland waterways, suitable for navigation _____	42
Table 6. Results of the participation of port management authorities as candidates under the CEF calls for 2014-2017 _____	68
Table 7. Distribution of the funds, allocated to port infrastructure management authorities by countries, in euro _____	70
Table 8. Number of successful projects by countries _____	71
Table 9. Number of inland waterway accidents in EU countries during 2008-2017 _____	97
Table 10. Risk factors of navigation in the cross-border region _____	104
Table 11. Results of navigation risk assessment _____	105
Table 12. Strengths, weaknesses, opportunities and threats analysis _____	107
Table 13. Activities and expected results of the Action Plan _____	111
Table 14. Indicative financial framework of the Action Plan _____	113
Table 15. A system of indicators for implementation of the Action Plan _____	123

## LIST OF DIAGRAMS

Diagram 1. Distribution of trade flow, transported on the Danube River in 2016 by countries,thousand tonnes	16
Diagram 2. Accessibility and connectivity of the Romania-Bulgaria cross-border region	23
Diagram 3. Map of Danube Bridge "Ruse-Giurgiu"	29
Diagram 4. Map of Danube Bridge 2, "Vidin-Calafat"	30
Diagram 5. Route Bulgaria-Romania via ferry connection "Oryahovo - Becket"	32
Diagram 6. Route Bulgaria-Romania via ferry connection "Svishtov-Zimnicea"	34
Diagram 7. Danube River navigable waterway	41
Diagram 8. Vessel traffic visualisation	77
Diagram 9. Strategic and main bottlenecks along the Danube River	102
Diagram 10. Risk assessment matrix	105
Diagram 11. Strategic framework	109

## LIST OF FIGURES

Figure 1. Distribution of the tugs and pushers, used in Romania, by year of production	15
Figure 2. Gradient curve of the Upper, Central and Lower Danube	36
Figure 3. Location of the countries along the Danube River	<b>Error! Bookmark not defined.</b>
Figure 4. Volume of the transported payload and fairway depth	43
Figure 5. Vessel movement speed (knots)	44
Figure 6. Assessment of port infrastructure quality in the EU (2015-2016)	46
Figure 7. Dynamics of the port infrastructure quality index in Bulgaria and Romania	46
Figure 8. Amount of external costs for different modes of transport	97

## LIST OF CHARTS

Chart 1. Goods transported by river rtransport in Bulgaria and Romania	16
Chart 2. Types of goods transported along the Danube River	18
Chart 3. Vessel draft restrictions in the Bulgarian section of the Danube River	100



## Introduction

The preparation of a final version of Joint strategy for improvement of navigation safety on the Lower Danube was carried out as a result of the implementation of Activity 4 of public procurement with subject *“Elaboration of Joint strategy for improvement of navigation safety on the Lower Danube”*. It was launched in relation to the implementation of project of Ruse Municipality and Giurgiu Municipality for *“Development of the River Danube for better connectivity of the Euroregion Ruse-Giurgiu with Pan-European transport corridor №7”*, financed under the INTERREG V-A Romania-Bulgaria Programme.

The main objective of the project is to elaborate a Joint strategy for improvement of navigation safety in the Romania-Bulgaria cross-border region on the Lower Danube.

The implementation of this activity is a logical continuation and a summary of the results from the previous three project activities. In this way and in accordance with the procurement terms of reference, the first part, which consists of items 1, 2, 3 and 4, presents in summary form what has been done in the analytical part of the elaboration.

The strategic part, which covers the next items of the material structure, is built on this basis. It starts with defining the vision, mission, strategic goals, investment priorities and operational objectives. To achieve what has been set out in this strategic framework, an action plan is developed and presented, together with risk management measures, measures for involvement of the responsible authorities and measures for waterway optimisation.

The last final part is dedicated to drawing up recommendations for the implementation of the developed action plan. Their purpose is to facilitate the plan management and implementation. They are entirely directed at the management of the responsible authorities and institutions.

# **1. Assessment of the state of waterway transport infrastructure on the Danube River in the Romania-Bulgaria cross-border region**

## **1.1. Legal framework**

### **1.1.1. Legal framework in Bulgaria**

The legal regime of the maritime space, inland waterways and ports of is established by the Maritime Space, Inland Waterways and Ports Act of the Republic of Bulgaria (MSIWPARB). Ports include water, territory and infrastructure on the Black Sea coast and the Danube River bank, islands and channels, located on the territory of one or more municipalities and comprise natural, artificial and organisational conditions for safe berthing, stay, and handling of vessels. The control over all ports (except the military ones) is exercised by the Minister of Transport, Information Technology and Communications. The port infrastructure and other fixed assets of the public transport ports of national importance are managed by State Enterprise “Port Infrastructure” (SEPI). Under the MSIWPARB the Management Board of SEPI adopts the annual program of the State Enterprise for construction, reconstruction, rehabilitation and maintenance of the public transport ports of national importance and offers it for approval by the Minister of Transport, Information Technology and Communications.

Under the MSIWPARB the terms and procedure for registration of ports, port terminals and specialised port facilities are established in Ordinance No 19 of 9 December 2004 on the Registration of the Ports of the Republic of Bulgaria with created Public Register of the Ports of the Republic of Bulgaria, which is administered by Executive Agency “Maritime Administration” and is published on the website of the institution<sup>1</sup>. Ports, port terminals and specialised port facilities shall be entered in the port register after the Ministry of Transport and Information Technology has issued an operational suitability certificate (OSC), with the inspections for issuing the certificate being conducted by the “Maritime administration” directorates in Burgas, Varna, Lom and Ruse. The OSC issuance regime is established in

---

<sup>1</sup> <http://www.marad.bg/page.php?category=53>

Ordinance № 9 of 17 October 2013 requirements for operational suitability of ports and specialised port facilities (OROSPSPF).

The territory and infrastructure of the ports can be owned by the state, municipalities, natural and legal persons.

MSIWPARB also defines port services such as commercial services provided in ports for public transport and by carried out by port operators.

Port services fall into the following categories:

- Marine technical services - pilotage, tugging (pulling or pushing), mooring, supplying ships with water, providing telephone and electricity; reception and treatment of waste - the result of shipping activity and others;
- Cargo and mail processing - loading, unloading, stacking, storing, repackaging of different types of cargo, inland (terminal) cargo and mail transport and other;
- Passenger services.

The right granted to port operators to provide services in public transport ports is defined as access to the port services market. The access to the port services market under Art. 116, para. 3, item 2 of public transport ports of national importance is granted by a concession – in cases under Art. 117 of the MSIWPARB.

#### **1.1.1. Legal framework in Romania**

The construction and maintenance of port infrastructure on the Danube River in Romania is carried out and controlled by the Ministry of Transport and Infrastructure through specially created state companies performing the function of a port authority. These are CN APDF SA Giurgiu<sup>2</sup> created by Government Decision № 520 of 24 August 1998 on the establishment of the National Company “Administration of the Danube Ports” – S.A. Giurgiu and CN APDM SA Galați<sup>3</sup> created by Decision No 518 of August 24, 1998, establishing the National Company "Maritime Administration of the Danube Ports" – S.A. Galați.

---

<sup>2</sup> <http://www.apdf.ro>

<sup>3</sup> [http://www.romanian-ports.ro/html\\_nou/index.php](http://www.romanian-ports.ro/html_nou/index.php)

The two companies, acting as port authorities, implement the policies of the Ministry of Transport and Infrastructure for developing and maintaining ports and port infrastructure and programmes for waterways development. They ensure the fulfilment of the obligations assumed by the State in the international agreements and conventions under which Romania is a party. The management is carried out both directly by performing port services, as well as by concession, rent and other contractual forms of separate territories, assets and parts of the port infrastructure.

In its activity, the two state-owned companies comply with the requirements of Order No 946/2005 of the Minister of Finance for the approval of “Internal control/management code, including standards for internal control/public companies management and for development of internal control systems”, subsequently amended and supplemented.

The port infrastructure managed by CN APDF SA Giurgiu and CN APDM SA Galați is part of the public ownership of national interest.

CN APDF SA Giurgiu manages 11 ports from Baziaș, Socol commune in Caraș-Severin County, Banat to Cernavodă, except the ports of Zimnicea and Turnu Măgurele, which are under the management of the local authorities. CN APDM SA Galați manages the port infrastructure, situated on the sea coast of the Danube River, relevant free port and ship anchorages, from km 12,5 to km 17,5 and from km 251 to km 255, including Galați, Braila, Tulcea, Harsova, Isaccea, Mahmudia and branches of Măcin, Chilia and Sfântu Gheorghe.

### **1.2. General characteristics and use of waterway transport infrastructure on the Danube River in the Romania-Bulgaria cross-border region**

Data on the waterway infrastructure on the Danube River in the Romania-Bulgaria cross-border region and its use can be received from several key sources such as Eurostat, national statistical institutes in both countries, state institutions responsible for river shipping, international organisations, publications of scientists, research organisations and consulting firms.

The navigable section of the Danube River, which borders with and is used by Bulgaria is 470 km, while in Romania it is 1075 km. Together with the tributaries of the Danube River, the total river road in Romania is 1647 km. In addition, 132 km of channels are also available in

Romania, which are also used for navigation. Thus, the total length of the waterway in Romania is 1779 km, which is 3.8 times more than Bulgaria.

The wharf front of the river ports for public transport of national importance in Bulgaria has a total length of 9 080 m, along which there are created 44 cargo, 5 ro-ro transport, 14 passenger and 3 service berths.

The wharf front of the river ports for public transport of regional importance in Bulgaria has a total length of 4 964 m, along which there are created 30 cargo, 2 ro-ro transport, 3 passenger and 12 service berths.

The transfer capacity under existing conditions, technical means and operating technologies in the river ports is estimated at about 22.5 million tons. In terms of capacity, the largest share belongs to the ports in the Ruse region – 50%, due to the presence to a large number of passenger ports and ferry terminals.

There are 29 ports in the Romanian part of the Danube, the largest of which are the ports in Galați, Braila and Tulcea, which are located in the sea section of the river. They are part of the TEN-T network, along with ports in Giurgiu, Oltenita and Drobeta-Turnu Severin.

The ports in Galați, Brăila and Tulcea, situated at the intersection of the sea and river Danube, are the largest inland ports (Galați – with an area of 864 131 sq. m, 56 berths, Brăila – with an area of 389 630 sq. m, 25 berths; Tulcea – with an area of 82 764 sq. m and 41 berths) and have a processing capacity of about 34 million tonnes per year, out of a total of 52 million tonnes per year in Romania.

The total number of self-propelled and non-self-propelled vessels in Bulgaria is constantly decreasing. From 157 vessels in 2007, they are 110 in 2016. Their capacity also drops - from nearly 245,000 tonnes in 2007 to 186,5 thousand tonnes in 2016.

A similar trend, but with lower rates of decline is also observed in Romania. There, the number of self-propelled and non-self-propelled vessels decreases from 1199 in 2007 to 1134 in 2016. The capacity of these vessels is reduced by 46 thousand tonnes in the period 2007-2015 to 1468 thousand tonnes. On the other hand, this reduction increases the average capacity of a ship. In Bulgaria it is 1,69 thousand tonnes in 2016 with 1,56 thousand

tonnes in 2007 and in Romania the respective figures are 1,29 thousand tonnes in 2015 and 1,25 thousand tonnes in 2010.

The age structure of river vessels in Bulgaria is extremely unfavourable. A predominant share of 35% in it is made by vessels manufactured in the period 1981-1990, i.e. 28-38 years ago. About 21% of the vessels were put into operation 40-50 years ago, and only 4% of them are new, i.e. they have been produced in the last 20 years.<sup>4</sup>

Romanian statistics provide information on the age structure only to tugs and pushers (including boats that do not carry passengers), which in total are 294 in 2016. The main contingent of these was produced in the period 1980-1989 and is more than 28 years old. More than a quarter of these vessels were produced in 1950-1969, ages 49-68. After 1990, 14% of tugs and pushers in Romania.

**Table 1. Number and carrying capacity of vessels in Bulgaria and Romania**

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
<b>Self-propelled and non-self propelled dry cargo vessels, number</b>										
Bulgaria	157	159	158	151	149	141	127	117	114	110
Romania	1199	1221	1232	1208	1097	1131	1152	1137	1134	:
<b>Carrying capacity, thousand tonnes</b>										
Bulgaria	244.8	250.5	253.8	247	246.6	236.6	216.9	197.7	193.4	186.5
Romania	:	:	:	1514	1450	1470	1475	1468	1468	:

: - lack of data.

Source: Eurostat, 2018.

---

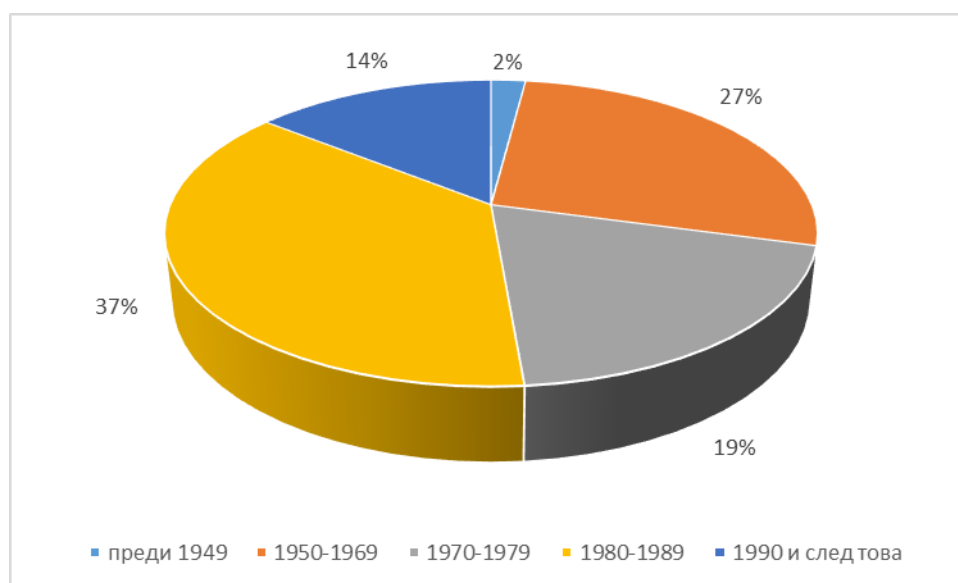
<sup>4</sup> Korolova P. Specifics of the Danube Fleet Management, Economic Studies, 6, 2017, pp. 118-152.

This age structure requires for the operators of vessels in both countries to constantly incur high maintenance costs in order to keep them in good condition, which reduces their competitiveness.

Romanian river transport provides transport average annual of about 30 000 thousand tonnes of goods for the period 2006-2016. Except for a more severe decline in the 2009 crisis, the volume of goods transported, in tonnes, is almost constant.

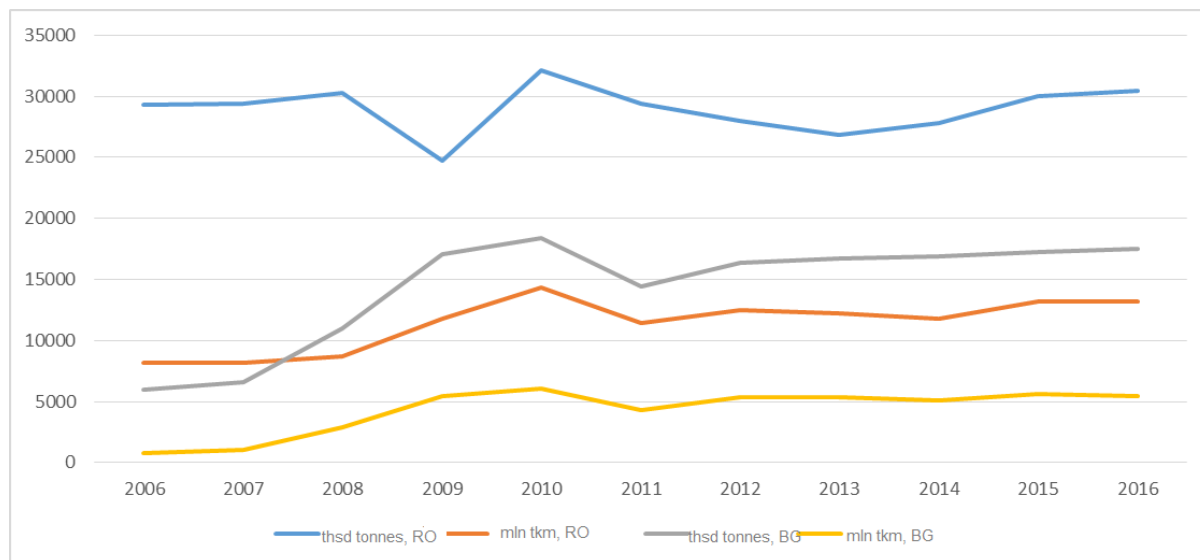
In contrast to Romania, the volume of goods transported in tonnes for the same period, increases significantly - from 5 950 thousand tonnes in 2006 to 17 467 thousand tonnes at the end of the analysed period. This represents a growth of nearly 3 times. Interestingly, during the country's 2009-2010 crisis, average annual growth is higher than in the years after the crisis, which indicates increased interest and restructuring of cargo flows in favour of cheap river transport.

**Figure 1. Distribution of the tugs and pushers, used in Romania, by year of production**



Source: Institutul Național de Statistică. Mijloace de transport existente, la sfârșitul anului 2016, 2017.

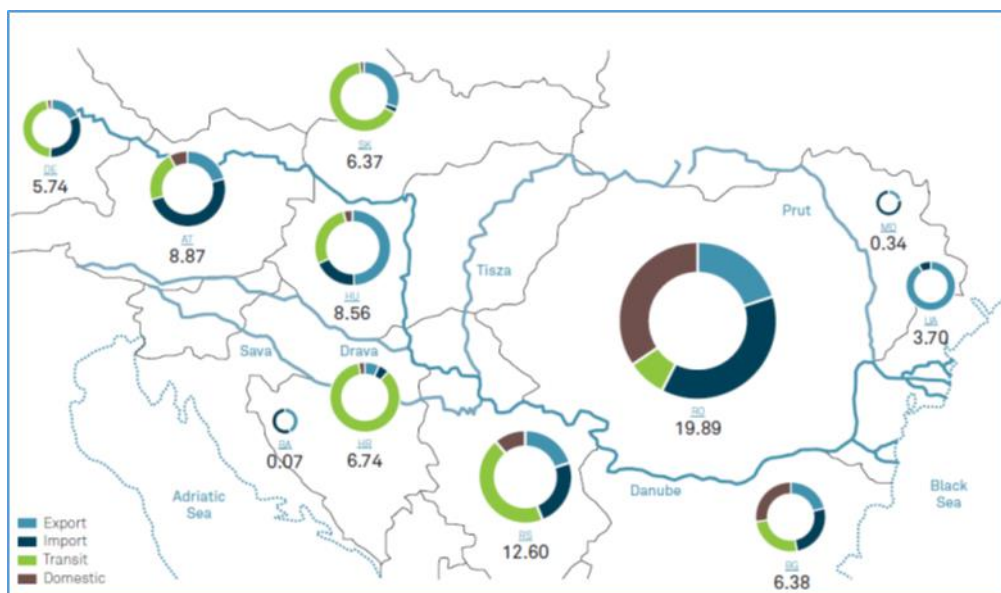
**Chart 1. Goods transported by river transport in Bulgaria and Romania**



Source: based on Eurostat data.

With these volumes of transported cargo, Romania ranks first among the other Danube countries, while Bulgaria together with Slovakia ranks 5-6.

**Diagram 1. Distribution of trade flow, transported on the Danube River in 2016 by countries, thousand tonnes**





Source: viadonau, Annual Report on Danube Navigation in Austria 2016.

A more accurate indicator of river transport performance measures the distance travelled and the weight of the cargo carried. By this index, the curves of the dynamics have almost the same variation. It can be noted that here the dynamics of transport in Bulgaria is higher than in Romania, due to the exceptionally low start base - 786 million tkm in 2006.

The modal distribution of transported goods carried shows that river transport services more than a quarter of the goods in Bulgaria, while in Romania this accounts for nearly 30% of the goods. Compared to the EU, this share is significantly higher, indicating the important position of river transport in the economy of both countries.

**Table 2. Modal split of freight transport by land, % of tkm for 2015**

Type of transport	road	rail	river	pipelines
EU	71,1	17,4	6,1	4,8
Bulgaria	53,0	17,3	26,6	3,1
Romania	37,1	30,8	29,7	2,3

Source: EC, EU Transport In Figures – Statistical Pocketbook 2017.

The structure of goods transported by Romanian river transport is dominated by two categories - ore, cast iron and steel, as well as processed and unprocessed mineral raw materials and construction materials. According to a study published in 2007, agricultural production and mineral fuels have a much lower and complementary share.

A major change is noticed 10 years later. The main goods transported in Romania in 2017 are agricultural goods - 28.7%, followed by minerals by 27.7% and construction materials - 20.7%. Coal with a share of 6,3% and petroleum products with a share of 4,6% are complementary.<sup>5</sup>

The structure of Bulgarian goods transported along the Danube River was more evenly distributed in 2007. The largest share of it belongs to processed and unprocessed mineral

---

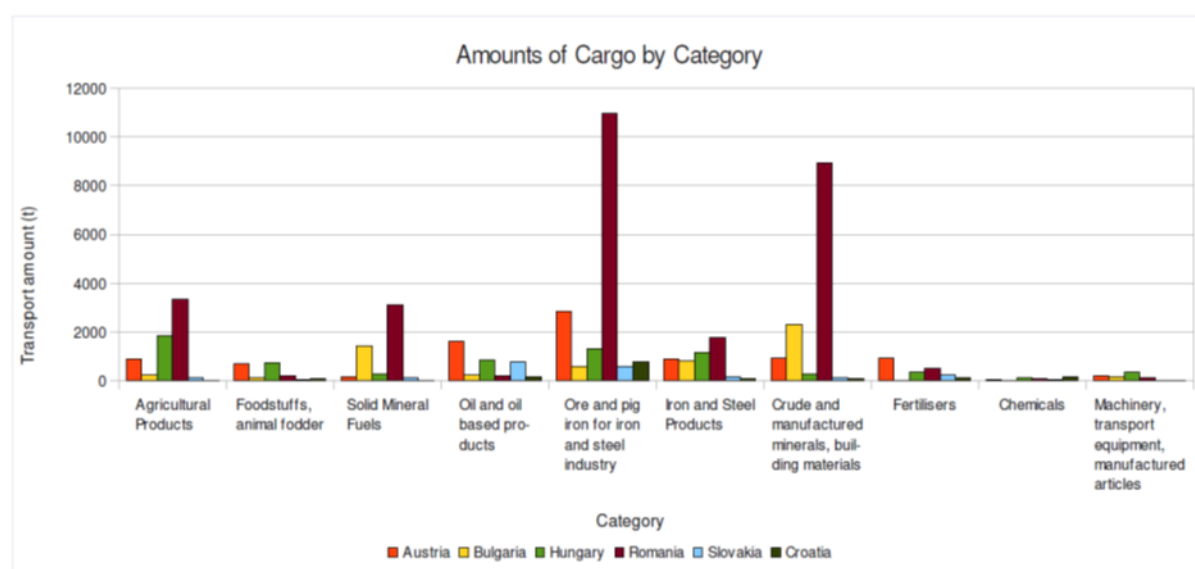
<sup>5</sup> Institutul Național de Statistică Transportul portuar maritim de mărfuri și pasageri 2017, 2018.

raw materials and building materials, followed by mineral fuels. Cast iron and steel castings, ores and agricultural products are then ranked. The similarity between the goods transported in both countries is that they are mainly raw materials and goods with low added value.

After 10 years there are also significant changes in the structure of the goods transported by the Bulgarian river transport. The largest share in it belongs to agricultural production – 40% of transported cargo by volume and 39,9% by tkm. The most important place in this group belongs to grain foods with 35% of cargo by volume and 37,1% by tkm.<sup>6</sup>

The volume of work carried out in ports is measured by the mass of the cargo handled. The total mass of these goods in Bulgaria in 2012-2016 fluctuates between 3,831 and 4,568 thousand tons. In structural terms, the changes during this period are in the decrease of the imports and the coastal flows at the expense of a serious increase in the export of goods. These volumes, however, are at times lower than the capacity of all ports in the Bulgarian navigable part of the Danube, indicating the existence of unused available capacity.

**Chart 2. Types of goods transported along the Danube River**



Source: ZKR Market observations, 2007.

<sup>6</sup> Based on Eurostat data.

**Table 3. Loaded and unloaded cargo in Bulgarian river ports by destination, thousand tonnes**

	2012	2013	2014	2015	2016
<b>Total</b>	<b>3894</b>	<b>3831</b>	<b>4529</b>	<b>4568</b>	<b>3993</b>
Import - unloaded	1682	1529	1688	1708	1312
Export - loaded	805	1112	1410	1165	1459
Inshore	1407	1190	1431	1695	1222

Source: NSI, 2018

Passenger transport along the Danube is of secondary importance in transport activities. After 2013, our country has only one passenger ship with 243 seats. The total number of passengers transported has a decreasing trend, reaching 94,000 people in 2016, compared to 175,000 people in 2012. The average passenger transport distance is only 1 km. It should be noted that the dynamics of this indicator is influenced by the commissioning of Danube Bridge 2, as well as by other socio-economic factors.

The decreasing number of transported passengers leads to a decrease in the number of passengers passing through the Bulgarian ports. Since 2008, this figure has been shrinking continuously, falling by 2.5 times in 2015 compared to 2008.<sup>7</sup>

In Romania, statistics show 156,000 passengers transported within the national borders in 2016.<sup>8</sup>

The number of enterprises the activity of which is related to inland waterway transport and goods handling and transport of passengers on the Danube River in Bulgaria is 31 and in Romania –126 in 2014.<sup>9</sup> They employ 900-person staff in Bulgaria and 2000 people in

---

<sup>7</sup> MTITC. Integrated transport strategy in the period up to 2030,S., 2017.

<sup>8</sup> SC FIP CONSULTING SRL. Study on Waterways Planning in CBC Region, 2018.

<sup>9</sup> Based on EU data, EU Transport In Figures – Statistical Pocketbook 2017.

Romania, with a turnover of 42 million euro in Bulgaria and 102 million euro in Romania in 2015.<sup>10</sup>

### **1.3. State of port infrastructure in the cross-border region**

River ports are considered to be complex dynamic systems that have a particular purpose, perform certain functions, they are composed of complex elements and are related to other modes of transport.<sup>11</sup> For these systems to work successfully, their constituent components need to function in synergy.

Each port performs certain basic and auxiliary functions. The main ones are the reception, handling and conveying of the delivered goods; storage and distribution of accepted goods; customs control and process monitoring; checking and handling of transport documentation accompanying cargo, etc. The auxiliary includes the provision of various types of services such as refuelling of ships, water and supplies (bunkering), maintenance and repair of vessels and transport units; cleaning of ships (waste, bilge water, etc.), etc.

An important condition for the quality performance of the functions of the river port is that its constituent elements meet certain technical, technological and organisational requirements. The technical elements include the different types of equipment, cargo storage areas and berths. These include the number of berths, the depth of the riverside, the number of loading and unloading devices, the dimensions of open and closed storage areas, etc. The technological components determine the purpose and specialisation of the port. Of importance are the technical means for handling, unloading and conveying different kinds of goods (bulk, volume, liquid, oversized loads and containers). The organisational elements are directly related to the status of the port - a public state enterprise or the ownership of a private person.

The main currently operating port quay mechanisation includes electric portal jib cranes, which are old (30-50 years old). There are very few purchased modern cranes. Even for handling containerships, the cranes, which are mainly used, are jib port cranes, instead of

---

<sup>10</sup> Same source.

<sup>11</sup> PINE, Prospects for Inland Navigation within Enlarged Europe, full final report, 2004, p. 150.

specialised gantry cranes. In many ports, new quay mechanisation has not been purchased for many years.

The main objectives and tasks that need to be fulfilled in the development of future design solutions for the development of transport schemes and technologies in port terminals should be directed towards providing technological equipment at modern technical level, meeting the conditions and volume of the work, which in turn ensures high reliability and safety for the personnel and the environment as well as preserving the commercial and consumer quality of the goods during their handling.

It is necessary to carry out constant monitoring of the state of the port infrastructure and the ways of its operation - the loading of stored materials and the mechanisation of the individual storage and reloading areas should not exceed the maximum admissible, as well as the taking of rapid and adequate measures in the detection of violations would provide a secure transport infrastructure to ensure the safety and security of the transport process. Furthermore, undoubtedly, a better strategically managed national port network has the potential to save time for cargo and passenger handling, also contributing to greater economic efficiency of investments (timely investment and as a result overall optimisation of the network usage).<sup>12</sup>

#### **1.4. Connectivity of the region through land transport infrastructure**

Inland ports make it easier to combine modes of transport - inland waterways, roads and railways operating as multimodal logistics chains. Rail and road transport act as partners of waterway transport for cargo and passenger transport before and after ports serving as primary interface. Over the last few decades, the Danube ports have undergone a major transformation from conventional inland ports to modern logistics centres. In addition to their core function of transshipment centres and storage sites, today's ports offer a wide range of logistics services, including commissioning, distribution and logistics of projects. Due to the fact that they serve as production sites as well as collection and distribution centres, they are extremely well integrated into the regional economies and contribute significantly to economic growth and job creation. The three most important port areas in

---

<sup>12</sup> *Integrated transport strategy in the period up to 2030*

terms of transshipment volumes of the Danube River are Izmail (Ukraine), Linz (Austria) and Galați (Romania). The port of Constanța in Romania occupies a special place. It is connected to the Danube via the Danube-Black Sea Canal and plays an important role as a freight forwarding portal for the Black Sea, thus facilitating trade with Asia, the Middle East and the Black Sea region.

The Romania-Bulgaria cross-border region is accessible thanks to the Danube floating river, which is part of the 7<sup>th</sup> pan-European transport corridor, which connects the Constanța port with the industrial centres in Western Europe and the port of Rotterdam via the Black Sea canal. For its part, it crosses two TEN-T corridors linking Central and Northern Europe to the southeast of the continent and the Middle East. The Danube River is, on the other hand, a tight boundary between the two countries due to the lack of infrastructure for crossing the river, which hinders cross-border cooperation and the socio-economic integration of the territory.

Diagram 2. Accessibility and connectivity of the Romania-Bulgaria cross-border region <sup>13</sup>



The total length of roads in the cooperation area is 16 511 km, including the regional and municipal roads. The total public road density is 22.95 km/100 sq.km, which is very small compared to the EU25 average of 110 km/100 sq.km. The density of roads along the Danube River is far below the national level. The secondary and tertiary network is underdeveloped throughout the area and is poorly maintained, with a high risk of accidents. In addition, certain roads are predisposed to floods, to a greater extent those on the Romanian side of the Danube. Many roads have insufficient capacity, resulting in

<sup>13</sup> Common Strategy for Sustainable Territorial Development of Romania-Bulgaria Cross-Border Region, 2015

overloading and, accordingly, increases the travel time, vehicle operating costs, accidents and environmental damage.

The density of the functioning rail network is approximately 46.1 km per 1000 square km in Romania and 38.9 km per 1000 square kilometres in Bulgaria, which is below the average of the EU countries (65 km/1000 sq.km) and this ranks them in the last two places among the networks in the European Union. The main rail link between Romania and Bulgaria crosses the Danube River on the Giurgiu-Ruse Bridge, while the other railway line between Negru Vodă and Kardam shows reduced traffic (freight and passenger trains only).

From the analysis of the quality of road and rail infrastructure and of transport services in both countries, it is clear that they are further behind in the European ranking, although land transport has the largest share in both Romania and Bulgaria.

The region is served by 3 international airports in Romania: “Constanța” (important during the summer season when taking flights from Paris, Strasbourg, Luxembourg, Bergamo, Pisa), “Craiova” (flights from London, Cologne/Bonn, Bergamo) and “Bucharest-Otopeni”, closest to the border. In Bulgaria, the nearest airports are in Sofia and Varna, but a large part of the population in the Bulgarian border region often regularly uses the airport in Bucharest.

The available transport network does not provide good connectivity between the two countries, nor easy access of the border areas to the TEN-T corridors and major national corridors. In fact, only one highway “Bucharest-Constanța” highway (220 km) passes through the cross-border area. This hinders the development of intermodal nodes that are vital to exploiting the potential of the Danube River for shipping and the economic development of the area.

#### **1.4.1. Border infrastructure between Bulgaria and Romania**

The border between the two countries is 610 km long, out of which 470 km is the water border along the Danube River. The border between Romania and Bulgaria is located between Pristol (Mehedinti County, Romania) in the west and Constanța County, in the east, at a distance of 631.3 km.

*The river border* is the inland waterway along the 470 km stretch of the Danube River (from kilometre 845,650 to kilometre 374,100), bounded between the right bank of the river and



the demarcation line of the border between the Republic of Bulgaria and Romania, defined in accordance with the Convention for the delimitation of the river border on the Danube, between Bulgaria and Romania from 1908. The border is between the towns of Vidin (Bulgaria) and Silistra (Bulgaria), respectively Calafat and Calarasi (Romania). The Danube River creates great opportunities for the development of water transport. It is the largest international river road through which Bulgaria is connected with the countries of Western and Eastern Europe. This creates conditions for lively commercial connections with these countries, great opportunities for tourism, as well as other economic activities. The important for the economic development corridor Bucharest-Giurgiu-Ruse-Veliko Tarnovo is located in the surveyed region, and it should be used. There are also pairs of towns on both sides of the Danube River: Vidin - Calafat, Bechet - Oryahovo, Turnu Magurele - Nikopol, Calarasi - Silistra, which can significantly contribute through their cooperation to the achievement of the regional development goals following the established example of cooperation between Giurgiu and Ruse. Additional benefits for the region can also be derived from its cultural and territorial diversity. The cross-border region Romania-Bulgaria is accessible mainly through the navigable Danube River, forming part of the 7th Pan-European Transport Corridor, which through the Black Sea channel connects the port of Constanța with the industrial centres in Western Europe and with the port of Rotterdam. For its part, it crosses two TEN-T corridors linking Central and Northern Europe to the southeast of the continent and the Middle East. The Danube River is, on the other hand, a tight border between the two countries, Bulgaria and Romania, due to insufficient infrastructure for crossing the river, which hinders cross-border cooperation and the socio-economic integration of the territory.

*The land border* is 139.1 km long, passing through Dobrudja, between Calarasi - Silistra and the Black Sea, separating Constanța County (Romania) from the districts of Silistra and Dobrich (Bulgaria) between the Danube and the Black Sea. It starts from the town of Silistra and ends with the Romanian village of Vama veche, situated on the Black Sea coast. The flat terrain of Dobroudja allows for road and rail roads. This border is crossed by the railway line "Razdelna – Kardam – Medgidia – Ungheni" /the shortest road between Bulgaria and CIS/ and road "Istanbul – Burgas – Varna – Constanța". An electrical interconnector from Ukraine and a gas pipeline from Russia pass through here.

*The sea border* is 22.2 km long and covers a strip of coastline with a width of 20 km. The development of the sea border is also associated with a number of problems. First of all, this is the severe ecological status of the Black Sea caused by the big rivers Danube, Dniro, Dniester and others. Coastal sewage also contributes significantly pollution. Due to the limited self-cleaning ability of the sea, fish wealth has greatly reduced, and the changes in biocoenosis are taking alarming proportions. In addition, there are insufficient transport links in the Bulgarian part with the interior of the region, which leads to under-utilisation of the coastal lands.

#### **1.4.2. Border-crossing infrastructure on the Bulgaria-Romania border**

There are three types of infrastructure to cross the border: river, road and air.

A serious barrier on the way of cooperation is the absence of border crossing points. Along these 470 km of the Danube River there are two bridges, both road and rail, and more ferry crossing points.

**Table 4. Infrastructure border crossing facilities between Bulgaria and Romania**

<b>Link</b>	<b>Type of transport</b>
Vidin - Calafat	Bridge (road and rail)
Lom – Rast	Ferryboat
Oryahovo – Bechet	Ferryboat
Nikopol/Somovit – Turnu Măgurele	Ferryboat
Svishtov - Zimnicea	Ferryboat
Ruse - Giurgiu	Bridge (road and rail)
Tutrakan - Oltenița	Ferryboat
Silistra - Călărași	Ferryboat

Link	Type of transport
Kardam – Negru Vodă	Land crossing points are located along the Black Sea coast
Durankulak - Vama Veche, as well as south of the Danube, between Silistra and Ostrov.	
Constanța, “Mihail Kogălniceanu” International Airport	Air transport
Craiova, international airport	Air transport
Gorna Oryahovitsa, international airport	Air transport
Ruse, municipal airport	Air transport

In addition to the two international airports on the Romanian side, good prospects for regional development is the Tulcea Airport in Constanța County. There is a potential for development at both airports operating in the Bulgarian part of the cross-border region - Gorna Oryahovitsa and Ruse.

Passenger traffic data and crossing frequency at checkpoints report moderate levels, with less than 61% of those crossing the border being of Romanian or Bulgarian origin. The exceptions are the “Ruse-Giurgiu” bridge and the “Vidin-Calafat” bridge over the Danube River, which are the most used points for crossing the border by the Romanian, Bulgarian and international traffic.

During the pre-accession period, improvements have been made to border crossing facilities with the support of the Phare CBC funds (1999-2004). Rehabilitation of the railway infrastructure and activities related to the safety of the infrastructure of the “Giurgiu-Ruse” bridge were carried out. Two mirror projects on both sides of the border have been implemented to improve connectivity through ferry connections and border crossing points Nikopol (Bulgaria) - Turnu Magurele (Romania) and Silistra (Bulgaria) - Calarasi (Romania).

During the 2007-2013 programming period, joint Romanian-Bulgarian projects have been implemented to improve mobility and accessibility in the region. As a result of the implementation of Cross-Border Cooperation Programme Romania-Bulgaria 2007-2013, there is increased mobility and interconnection in the cross-border region - 169 km built/modernised roads serving about 500 000 people.<sup>14</sup> An example of such a project is “SMART” – “Sustainability, mobility, accessibility in the cross-border region Constanța - Dobrich - transport infrastructure”. The activities are focused on the renovation of road sections in Dobrich and the supply of road equipment in Constanța. Dobrich Municipality implements full reconstruction of important road sections, which have a role as a transport entrance-exit of the city in the direction of Constanta.

Although the Danube has the function of a major artery of the European transport system, it has less importance than expected in the economy and transport in the cross-border region. At present, only 10-15% of its transport capacity is used. Important for the development of the Rhine/Maas-Maine-Danube river transport axis (TEN-T Priority Axis), which is the main cargo route linking the Rotterdam port from the North Sea to the Black Sea (especially Constanta and the Bulgarian ports ), as well as with the river ports located on the inland waterway.

The main problem is the crossing capacity of the border checkpoints between Bulgaria and Romania, especially at Danube Bridge “Ruse-Giurgiu”, most often for the outgoing and incoming cargo traffic from and to the Republic of Bulgaria, and often for passenger vehicles traffic.<sup>15</sup> According to a document by the Bulgarian-Romanian Chamber of Commerce and Industry (BRCCI), it is necessary to take measures to expand the border checkpoint at Ruse and to open a new checkpoint on the Bulgarian side of the bridge. There are possibilities that need to be analysed to find new ferry lines that could partially take away the traffic from the Danube Bridge at Ruse-Giurgiu. The BRCCI has information on existing interest and willingness on the part of investors, but coordination is needed to investigate the possibilities and organise the crossing checkpoints.

---

<sup>14</sup> *Interim report on the closure of the programmes co-financed by the European Union and the countries of the European Economic Area for the 2007-2013 programming period as well as the progress made under the programmes for programming period 2014-2020 (based on data as of June 30, 2016)*

<sup>15</sup> <http://www.brcci.eu/problemi-pri-preminavane-na-gkpp-bulgaria-romania>

## State of the transport links for land transport (road and rail)

Transport link	Ruse - Giurgiu
Type of transport	Bridge (road and rail)

**Diagram 3. Map of Danube bridge  
“Ruse-Giurgiu”<sup>16</sup>**



Danube bridge “Ruse-Giurgiu” (for rail and road transport) was built almost 60 years ago and provides connection with the countries of Western, Central and Eastern Europe, Greece, Turkey and the Middle East. The rail and road transport traffic is extremely intensive. As a result of the long exploitation, the road infrastructure next to the “Danube Bridge” Border checkpoint is in extremely poor condition and is need of

renovation, as well as of complete reorganisation of the traffic, aestheticisation of the surrounding areas, construction of parking lots, placing of horizontal and vertical marking and signalisation. The bridge itself needs a major overhaul of the road section and modernisation of the lighting.

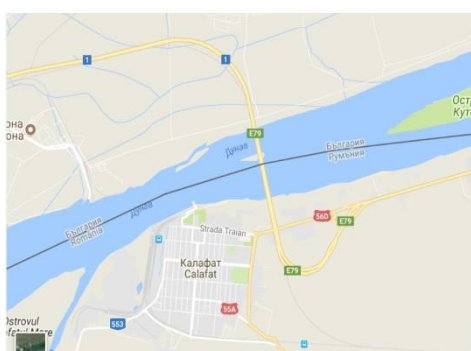
### *Connecting infrastructure:*

**Bulgaria:** first class road I-5 (E85: Ruse - Veliko Tarnovo), first-class road I-2 (E70: Ruse - Varna), second-class road II-21 Ruse - Silistra, third-class road III-501 (Ruse - Dve Mogili - Byala), which are an entrance and an exit in the Republic of Bulgaria through the “Danube Bridge” Border checkpoint.

<sup>16</sup> Regional strategy for development of Ruse Region 2014-2020

Transport link	Vidin - Calafat
Type of transport	Bridge (road and rail)

**Diagram 4. Map of Danube bridge 2, “Vidin-Calafat”<sup>17</sup>**



The bridge was opened in 2013. The bridge has a length of 1 971 m, and it has two lanes in each direction, a single electrified railway line and a bicycle lane. Infrastructure works include the construction of a new freight train station and 7 km of a new railway line, reconstruction of the existing passenger station and construction of four road junctions with two levels.

#### *Connecting infrastructure:*

**Bulgaria:** The first-class Republican road I-1 from Vidin to Botevgrad connects the bridge with “Hemus” highway. A shorter way to Sofia is possible through Petrohanski passage, which is picturesque but also more difficult to pass. There is a planned extension of the road from Vidin to Botevgrad to become a speedway.

**Romania:** The shorter route to Hungary via Drobeta-Turnu Severin is fully rehabilitated and of good quality but it passes through settlements.

Danube Bridge “Vidin-Calafat” is of key importance not only for the future development of the Trans-European Transport Corridor IV but also for the whole south-eastern transport axis of Europe and the Trans-European Transport Network with the opportunities to be found for combined transport and for the transfer of certain traffic volumes from road to rail.

<sup>17</sup> <http://www.vidincalafatbridge.bg/bg/page/115>

The railway connection between Bulgaria and Romania is made through:

- Railway border crossing “Ruse – Giurgiu-North” with common border station for freight trains Ruse rail yard and for passenger trains Ruse, and with border station “Giurgiu-North”;
- Railway border crossing “Kardam–Negru Vodă” with exchange border station “Negru Vodă” and border station “Kardam”;
- Railway border crossing “Vidin-Calafat” with common border stations “Vidin passenger” for passenger trains and “Vidin freight” for freight trains, on the territory of the Republic of Bulgaria and border station “Golenci”, on Romanian territory.

The road network connecting Bulgaria and Romania consists of the following roads:

- First-class road I-7 (Border Romania – m.r. Silistra – m.r. Dulovo – m.r. Shumen – m.r. Preslav – Varbitsa – Beronovo – Marasha – m.r. Yambol – m.r. Elhovo – Granitovo – Melnitsa – Lesovo – border Turkey);
- First-class road I-9 (Border Romania – Durankulak – Shabla – m.r. Kavarna – Balchik – Obrochishte – Kranevo – Zlatni pyasatsi – Sveti Konstantin – Varna – Staro Oryahovo – Obzor – m.r. Slantchev bryag – Burgas – Marinka – Zvezdets – Malko Tarnovo – border Turkey);
- Second-class road II-29 section of E70 (Dobrich – General Toshevo - Kardam – border with Romania);
- Third-class road III-293 (Aleksandria – Koriten – Severnyak, which is entirely on the territory of Dobrich region and crosses the border with Romania).

### **State of the transport links for water transport**

The main Danube ports on the Romanian-Bulgarian border are: “Calafat”, “Turnu Măgurele”, “Giurgiu”, “Oltenița”, “Călărași” in Romania and “Vidin”, “Lom”, “Oryahovo”, “Svishtov”, “Ruse”, “Silistra” in Bulgaria. They are important for the cargo transport, as well as for the tourists, arriving in Giurgiu and Oltenița (for one-day visits to Bucharest, Ruse,

Svishtov, Veliko Tarnovo, etc.), however the existing port infrastructure needs development. Also, year-round Danube navigation throughout the year (including during periods of drought or harsh winter) is another issue that requires attention and both countries have agreed on this with a memorandum signed in 2012.

The currently functioning ferry connections are “Oryahovo – Bechet”, “Nikopol - Turnu Măgurele” and “Svishtov – Zimnicea”.

Transport link	Oryahovo – Bechet
Type of transport	Ferryboat

**Diagram 5. Route Bulgaria–Romania through ferryboat link “Oryahovo-Bechet”<sup>18</sup>**



Ferryboat complex “Oryahovo” was opened in 1994 and it is an important transport link with Romania and Europe. The ferryboat link connects the towns of Oryahovo and Bechet. The potential of the Oryahovo Border checkpoint and the two ferryboats – Romanian and Bulgarian, allows handling 200 outgoing and 200 incoming heavy trucks for 24 hours. The improvement of the border connections, by modernising the ports and expanding the infrastructure at the transport nodes,

will facilitate cross-border cooperation activities with the Danubian regions in the Danube River basin.

#### *Connecting infrastructure:*

**Bulgaria:** second-class roads II-15 (Vratsa - Miziya – Oryahovo) and II-11 (Vidin – Lom – Oryahovo - Gulyantsi – Nikopol).

<sup>18</sup> <http://www.ferry.bg/>



An important infrastructure project for the Pleven region is the rehabilitation of the Pleven - Knezha - Oryahovo transport link through which the axis may be “unlocked” to the north with access to the “Oryahovo-Bechet” ferryboat.

Transport link	Nikopol - Turnu Măgurele
Type of transport	Ferryboat



The “Nikopol-Turnu Măgurele” ferryboat has been functioning since 2010. The distance between the two banks is 800 m, using the smallest length between the two sides. The crossing of the river by the Romanian ferry takes 8 minutes, and by the Bulgarian one - about 15 minutes. The Romanian platform has a capacity of 6 TIR trucks.

#### *Connecting infrastructure:*

*Bulgaria:* second-class road II-52 (Nikopol – Svishtov – Byala (Ruse – Veliko Tarnovo), serving the northern river areas of the Pleven region, which is part of the Danube panorama road and second-class road II-34 (Nikopol - Pleven) - connection of the regional town of Pleven with the port of Nikopol.

Transport link	Svishtov – Zimnicea
Type of transport	Ferryboat

**Diagram 6. Route Bulgaria–Romania through ferryboat link “Svishtov-Zimnicea”<sup>19</sup>**



The ro-ro ferry crossing the Danube between Svishtov (Bulgaria) and Zimnicea (Romania) provides the shortest connection between Bulgaria - Romania - Central and Western Europe, as well as for Sofia, Central and Southern Bulgaria and Turkey and the Middle East. The ferry is served by two ships and it takes 15 minutes to cross the river.

#### *Connecting infrastructure:*

**Bulgaria:** Diversions along the road to the “Svishtov – Zimnicea” ferry include: the town of Polski Trambesh to Svishtov; “Byala” station through Tsenovo to Svishtov; on main road “Sofia – Ruse” at the village of Balgarene to Svishtov.

**Romania:** The route diversion is at Aleksandria or Roşiori de Vede to Zimnicea.

### **1.5. State of the waterways and transport on the Danube River in Romania and Bulgaria**

The most important inland waterway in Romania and Bulgaria is the Danube River, Pan-European Corridor VII, in terms of water potential. With a length of 2,845 kilometres, the Danube is the second longest river in Europe after the Volga. In one of its first hydrographic publications, the European Commission for the Danube, established in 1856, states that the Danube originates from the merger of its two major streams, Bregge and Brigach, at

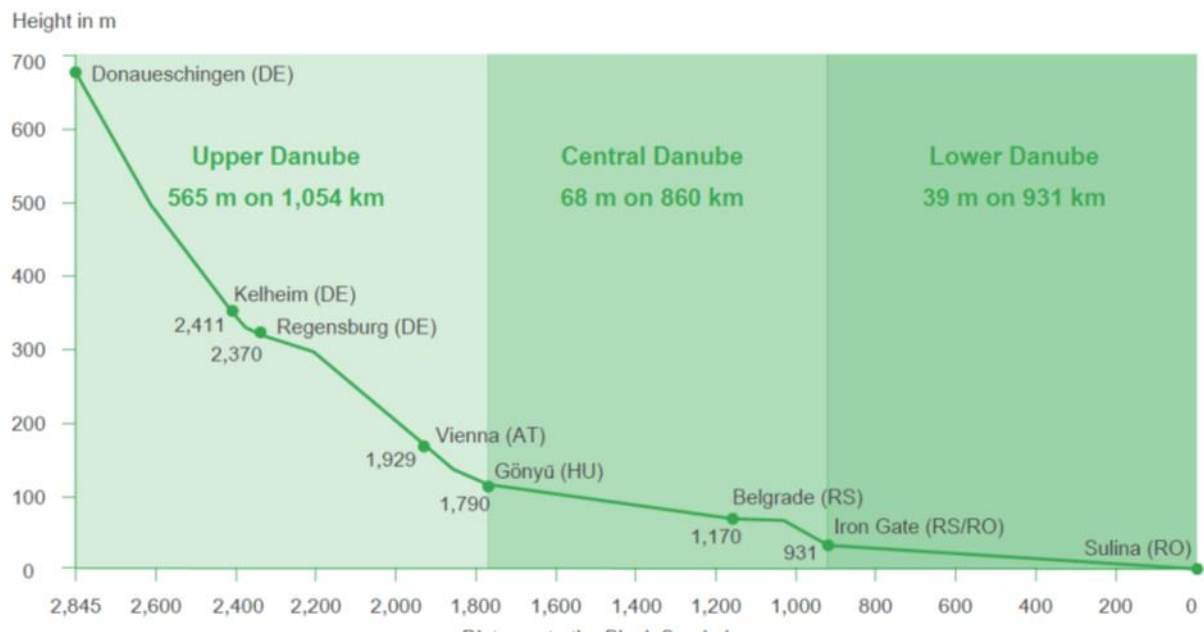
<sup>19</sup> <http://www.ferry.bg/>

Donaueschingen in Schwarzwald in Germany (this city was adopted as the starting point of the Danube River), and this river merger has a length of 2,845 kilometres (measured to its mouth in the Black Sea at km 0 at the Sulina River at the average distributor of the Danube Delta). When measuring the distance from the origin of the longest of the two outlines, Breg, in Furtwangen to the Black Sea along the Sulina River, the total length is 2,888 kilometres. The Danube River can be divided into three main parts - upper, middle and lower parts of the section.

Due to the high gradient in the first third of the course (over 1,055 kilometres), the upper Danube has the characteristics of a mountain river. For this reason, almost all river power plants are taking advantage of the water flow gradient in this part of the Danube. Only after the gradient change in Gönyű in the northern part of Hungary (river-km 1 790) the river gradually turns into a low river.

While the Upper Danube has an average height difference of just over 0.5 metres per kilometres, the average difference in height of the Lower Danube is just over 4 centimetres per kilometre. The following illustration shows the curve of the Danube River gradient from its source in Donaueschingen to its mouth in the Black Sea.

**Figure 2. Gradient curve of the Upper, Central and Lower Danube**



Source: via dunau.

The Danube River originates in Schwarzwald in Germany and drains into the Black Sea in Romania and Ukraine. The river has a length of 2,845 kilometres, of which 2,250 kilometres are navigable, connecting ten rivers. From an early history, the Danube is a major trade route in Europe. It is an important source of energy and drinking water, as well as a unique wildlife habitat and recreation area.

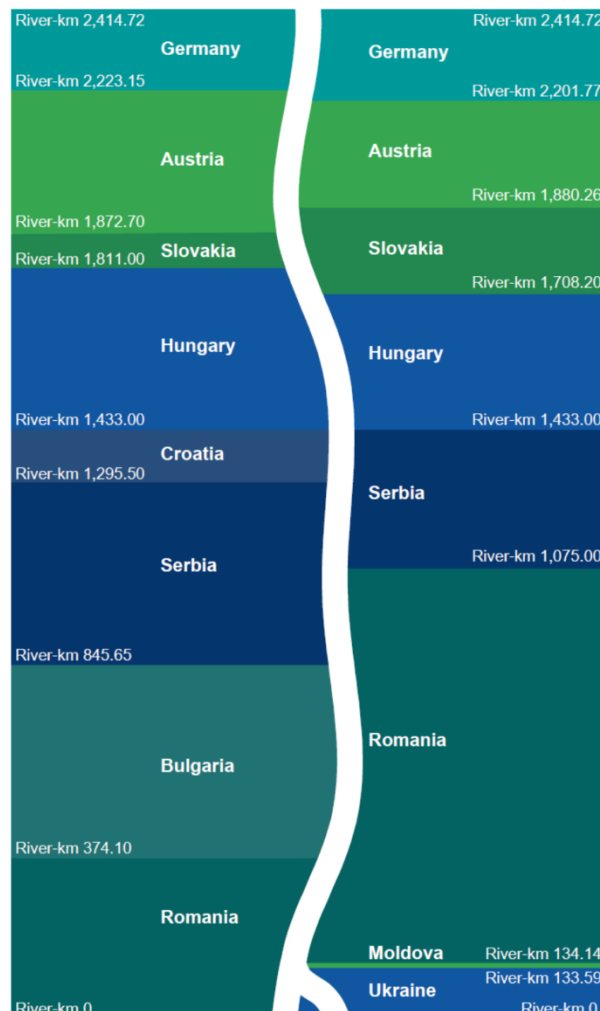
The area of the river basin is the area of the land where all the water from land surfaces, streams and groundwater sources flow into the river. The Danube River basin covers 801 463 km<sup>2</sup>. It is located to the west of the Black Sea in Central and Southeast Europe. In terms of the average inflow, the five main tributaries of the Danube River are Sava (1,564 m<sup>3</sup> / sec), Tisa / Tisza / Tysa (794 m<sup>3</sup> / sec), Inn (735 m<sup>3</sup> / sec), Drava / Drau (577 m<sup>3</sup> / sec) and Siret (240 m<sup>3</sup> / sec).

The longest tributary of the Danube River is Tisa /Tisza/Tysa with length of 966 kilometres, followed by Prut (950 kilometres), Drava/Drau (893 kilometres), Sava (861 kilometres) and Olt (615 kilometres).

The length of the navigable waterways in the Danube basin (the Danube, including all navigable distributaries and side arms, canals and tributaries) reaches approximately 6,300

kilometres. 58% or 3600 kilometres of these are waterways of international importance, ie. waterways with UNECE Class IV or higher.

**Figure 3. Location of the countries along the Danube River**



Source: via dunau.

### **1.5.1. Legal and organisational framework for maintenance of the navigation on the Danube River**

The main objective regarding the maintenance and optimisation of the waterway infrastructure by the riparian Danube countries is the creation and the year-round provision of internationally harmonised parameters of the fairway.

The recommended minimum fairway parameters for European waterways of international importance - including the Danube - are listed in the European Agreement on Main Inland Waterways of International Importance – AGN/ (United Nations Economic Commission for Europe 2010). With regard to the fairway depth to be provided by the waterway administrations, AGN makes the following provisions: For waterways with variable water values, the minimum vessel load value of 2.5 metres shall be reached or exceeded on average 240 days a year. For the northern stretches of natural rivers characterised by frequent water levels due to weather conditions (for example in the Upper Danube), it is recommended to refer to a period of at least 300 days on average per year.

Based on the Convention regarding the regime of navigation on the Danube River, signed in Belgrade on August 18, 1948 (the Belgrade Convention), the Danube Commission recommended the following parameters of the Danube waterway fairway: 2.5 m minimum depth of the fairway ), respectively 2.5 m minimum vessel load (2013) below low navigable water level (LNWL), i.e. an average of 343 days per year) on free flowing stretches and a minimum fairway width of 100 to 180 metres, depending on the specific characteristics of the the relevant river section (the Danube Commission 1988 or the Danube Commission 2011).

On June 7, 2012, transport ministers of the riparian Danube countries met for the first time during the EU's Council of transport ministers in Luxembourg, to agree on a Declaration on effective waterway infrastructure maintenance on the Danube and its navigable tributaries. The declaration appeared as a reaction to the low drainage of the Danube in the autumn of 2011, which revealed the shortcomings of some countries in maintaining the waterway infrastructure. The riverside countries are committed to maintaining adequate fairway parameters for good navigation status under the provisions of the “Belgrade Convention” and for countries that have ratified the European Agreement on Main Inland Waterways of International Importance - AGN. The Danube transport ministers will meet once a year to follow up on the conclusions of this meeting and to coordinate their actions for the implementation of the objectives of the declaration within the governance structure of the European Strategy for the Danube Region (EUSDR) and the European Coordinator of the the Trans-European Transport Network (TEN-T), responsible for the inland waterways. The declaration is signed by all riparian countries except Hungary.

### 1.5.2. Waterway dimensions

On inland waterways, the movement of ships and crews is allowed not across the whole width of the waterway, but only in that part which is prepared for navigation and is marked with special navigation signs. This part of the river is called waterway. It is characterised by depth –  $h_{\text{кп}}$ , width –  $B_{\text{кп}}$ , curve radius –  $R_{\text{min}}$ , height of navigable free passage and air lines. These are waterway dimensions.

In order to ensure safe navigation, the waterway dimensions must be such that, when the largest ships allowed to navigate along the respective waterway are passing, the minimum vessel draft is ensured, there is sufficient width for the vessels to pass each other and for outsailing and there is the necessary curve radius.

**The waterway depth ( $h_{\text{кп}}$ )** shall be calculated as the sum of ship's draft  $h_{\text{г}}$  and the stock under the ship's bottom  $\Delta h$ , determined under the Rules of navigation depending on the waterway depth:

$$h_{\text{кп}} = h_{\text{г}} + \Delta h \quad (1)$$

**The following definitions and water levels ranges for the Danube River in the Bulgarian section are adopted:**

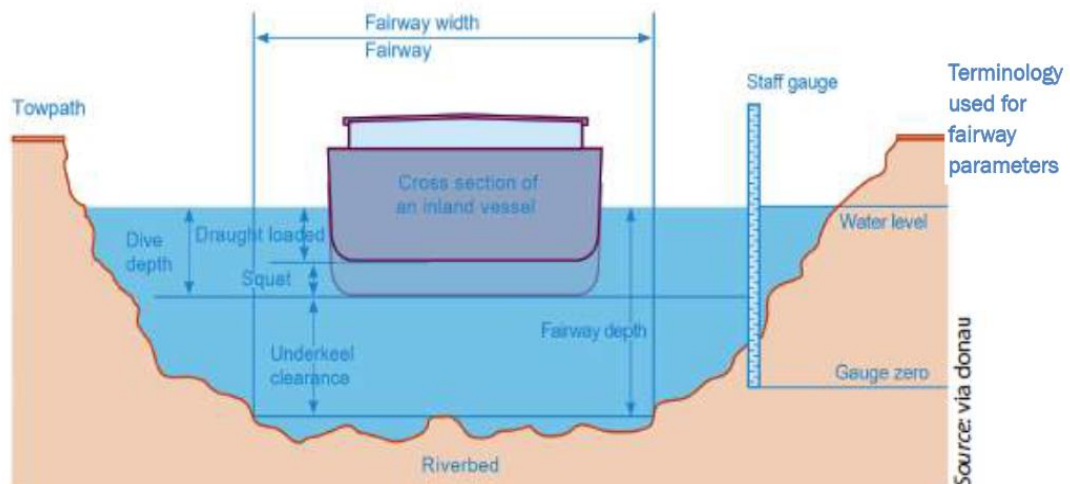
- low level: under 200 cm;
- average level: from 200 to 500 cm;
- high level: over 500 cm.

**The waterway width ( $B_{\text{кп}}$ )** with one-sided movement is defined as the sum of the width of the relevant ship and gear ( $B_{\text{с}}$ ) and the width stock to the end of the waterway route ( $\Delta B_1$ ):

$$B_{\text{кп}} = B_{\text{с}} + 2\Delta B_1 \approx 2B_{\text{с}} \quad (2)$$

**The minimum curve radius** of the waterway shall be determined according to the length of the estimated composition  $L_{\text{с}}$ :  $R_{\text{min}} \geq 3L_{\text{с}}$  (4)

**Useful altitude of the navigable passageways** below the bridges and air lines is called the distance from the water surface to the lowest point in the design of the relevant bridge or the relevant air line.



### 1.5.3. Characteristics of the navigation conditions

The Danube River is the second longest river (2,845 km) on the European continent and is of paramount importance for the countries through which it passes: Germany, Austria, Slovakia, Hungary, Romania, Bulgaria, Croatia, Serbia, Ukraine and some parts of Switzerland, Poland and Moldova. As part of the “Rhine - Main – Danube” Canal, the river facilitates the international trade from the Black Sea to the North Sea.

Depending on the navigation conditions, the Danube is divided into three main sections:

- **Upper Danube** – from the springs to Vienna – the river bed is not wide, but it is sufficient for navigation. The highest water level of the river in this section is between May and August<sup>20</sup>, and the lowest water levels are reported between October and March;
- **Middle Danube** – from Vienna to Iron Gate. The highest water level of the river is in April and March, and low water is observed between August and October;

<sup>20</sup> Via-Donau, [http://www.donauschifffahrt.info/daten\\_fakten/verkehrsweg\\_donau/eckdaten/](http://www.donauschifffahrt.info/daten_fakten/verkehrsweg_donau/eckdaten/), 2006,



- **Lower Danube** – from Iron Gate to Sulina. Fluctuations in the water level of this section are observed during the same periods of the year, which are characteristic of the Middle Danube.

**Diagram 7. Danube River navigable waterway**



With the opening of the “Rhine - Main – Danube” Canal, the importance of the river for the cross-border region is increasing because the country has the opportunity to have a direct water connection with the countries of Western and Northern Europe. The Danube is characterised by a complex shipping regime. The rules for its use are governed by special international treaties, conventions and agreements that guarantee the free navigation of all countries subject to certain security and fault-free rules.

In order to adopt a relevant water section for sailing, it is necessary that it meets certain requirements such as the depth of the fairway; river bed width; number, density and clearance of the bridges; number of locks, etc. On the basis of these indicators, the EU's Council of transport ministers has adopted a decision<sup>21</sup>, according to which Europe's inland waterways are classified into different categories in order to determine which types of vessels (depending on their technical and operational parameters) can be used in cargo transport.<sup>22</sup>

<sup>21</sup> Resolution № 92/2 of the European Conference of Ministers of Transport, Brussels, 1992

<sup>22</sup> GIFT TRANSPORT NETWORK PROPOSALS (CORRIDOR VII).

**Table 5. Parameters of the main categories of inland waterways, suitable for navigation**

Navigation inland waterway category	Measurements of the vessels			Length of bulwark opening
	Length	Width	Draft	
from I <sup>st</sup> to III <sup>rd</sup>	up to 80 m	up to 9 m	1.40 – 2.20 m	4.00 – 5.00 m
IV <sup>th</sup>	80 – 85 m	9.50 m	2.50 m	5.25 – 7.00 m
V <sup>th</sup> a	95 – 110 m	11.40 m	2.50 – 2.80 m	7.00 – 9.10 m
V <sup>th</sup> b	172 – 175 m	11.40 m	2.50 – 2.80 m	7.00 – 9.10 m
VI <sup>th</sup> a	95 – 110 m	22.80 m	2.50 – 4.50 m	7.00 – 9.10 m
VI <sup>th</sup> b	185 – 195 m	22.80 m	2.50 – 4.50 m	7.00 – 9.10 m
VI <sup>th</sup> c	270 – 280 m	22.80 m	2.50 – 4.50 m	9.10 m
	195 – 200 m	33 – 34.20 m	2.50 – 4.50 m	9.10 m
VII <sup>th</sup>	285 m	33 – 34.20 m and more	2.50 – 4.50 m	9.10 m

Source: Blue Book: Inventory of main standards and parameters of the E-waterway network.

According to the defined parameters and categorisation of the inland waterways of Europe, the Bulgarian section of the river Danube falls in class VII. The technical parameters of the water sections falling under categories VI and VII may provide safe navigational conditions for the movement of ships carrying oversized, heavy and bulk cargo as well as containers stacked on three or four levels.

In addition to the listed technical parameters and quantitative indicators characterising the density and category of Danube inland waterways, there are also factors influencing their capacity, namely:

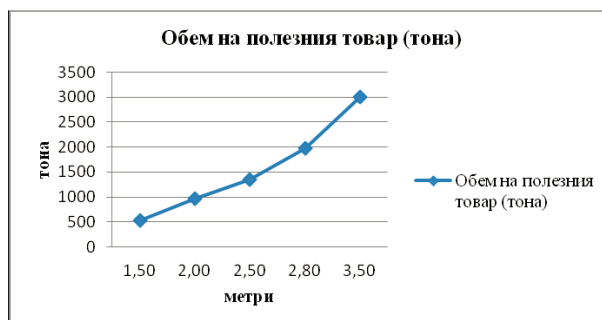
- Shipping to be carried out at any time during the scheduled navigation period;
- The navigation period may be shorter than 365 days a year only when the state of a given river stretch is affected by climatic conditions and ice formation may occur.

Therefore, the quality of the riverways and their adjacent facilities is essential for the regular and safe cargo transport, as it serves to define:

- The maximum permissible speed and size of the vessels;
- Permissible draft depth, which is directly related to the type and volume of the transported cargo;
- The permitted width of the fairway on which the shipping safety depends.

The study of the relationship between the condition and the peculiarities of inland waterways and ground facilities and the technical and operational characteristics of the vessels is an important prerequisite for improving the performance of the river fleet. The load capacity and load capacity ratios have a direct impact on the performance of transport operators and indirectly on the amount of variable costs.

**Figure 3. Volume of the transported payload and fairway depth** <sup>23</sup>

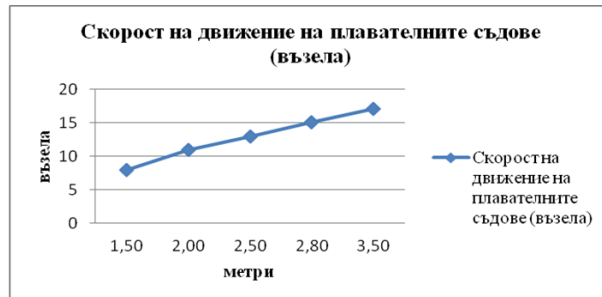


There is a direct proportionality between the volume of payload and the depth of the fairway. This dependence gives reason to conclude that vessels with lower load capacity and draft depth are used in unfavorable shipping conditions, i.e. at values of

the technical parameters of the fairway below the allowable. In each improvement of the technical characteristics of the river and ground facilities, the depth of the ship's draft is increased and an inverse impact on the total amount of the variable costs.

<sup>23</sup> GIFT TRANSPORT NETWORK PROPOSALS (CORRIDOR VII)

**Figure 4. Vessel movement speed (knots)<sup>24</sup>**



Direct proportionality is also noticed with the fairway depth's impact on the speed of ships. Improvement in navigation conditions is accompanied by the possibility of achieving higher movement speed of vessels.

Increasing the speed of traffic is a factor that has a positive impact on the regularity of the transportation and the total time of movement of the ships. Improving these quality indicators is important for increasing the efficiency of conducting cargo transportation by river transport.

Navigation conditions on Danube inland waterways are also affected by seasonal fluctuations of the river level (high water, low water and ice formation) and the presence of narrow stretches along the waterway. Controlling these phenomena in many cases is impossible and has a negative impact on shipping. At certain times of the year the level of the Danube fluctuates to a varying extent in the different sections due to the specific features of the climatic and geological conditions.

There are significant fluctuations in the permissible depth of drafting of the vessels in the Bulgarian section of the Danube River. There are periods in which shipping restrictions are extremely long-term, resulting in outflow of cargo flows to and from Bulgaria and reallocation of cargo traffic to other modes of transport. Between 12% and 18% of the days of the year, the Danube River basin is inappropriate for safe navigation during the examined ten-year period.

The presence of low water in the summer months in certain places necessitates the transfer of river ships in order to reduce their drafting depth, which in turn prolongs cargo delivery times and increases the cost of transport services.

---

<sup>24</sup> Source: Danube Commission

Ice-water formation is another phenomenon that has a negative impact on the rhythm and efficiency of cargo transportation. The occurrence of such force majeure is accompanied by an increase in the variable costs of river operators and a decrease in consumer demand due to an increase in the cost of transport services.

Another weakness of a section of the Danube in the cross-border region is the presence of narrow stretches. These waterways of international importance belonging to the European inland waterway system and whose parameters do not meet those approved for classification in the relevant category are defined as bottlenecks.<sup>25</sup> The presence of bottlenecks along the Danube is a sign of unsatisfactory quality of waterways and hampered shipping. The inadequate depth of the fairway limits the rational utilisation of vessel load capacity and therefore it is possible to transport only certain types of cargo, and this is directly related to the loss of inland waterway market positions and the decrease of consumer demand.

In the field of inland waterway transport, the current maintenance of the shipping route, incl. navigation and route situation on the Danube River is carried out by Executive Agency “Exploration and Maintenance of the Danube River” (EAEMDR) under the rules of the Convention for the shipping regime (SG 112/1949) and the Agreement between the Governments of the Republic of Bulgaria and the Republic Romania from 1955 pursuant to Art. 39 of the Convention and according to Art. 77, 82 and 83, para. 2 of the Law on Maritime Spaces, Inland Waterways and Ports Of The Republic Of Bulgaria. According to the Convention, no fees for ship transit are established, with the maintenance costs being financed by the Republican budget.

#### **1.5.4. Problems in the construction and maintenance of waterway transport infrastructure**

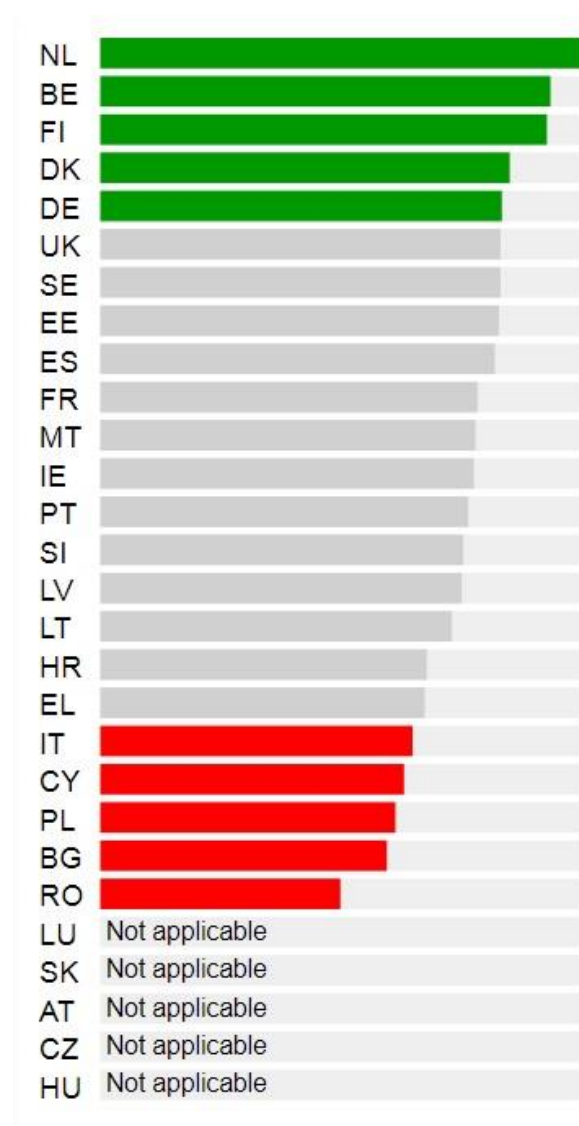
In terms of port infrastructure quality, in 2016 Bulgaria occupies the 70<sup>th</sup> place and Romania is 98<sup>th</sup> among 137 countries according to the Global Competitiveness Report 2016-2017. The Netherlands has a leading position not only in Europe but also globally for best port infrastructure.

---

<sup>25</sup> *Inventory of Main Standards and Parameters of the E Waterway Network, “Blue Book”, second revised edition, UNECE, 2012, p. 3.*

Within the European Union, the two countries in the cross-border region and among the EU Member States - Bulgaria and Romania rank amongst the last in the quality of the port infrastructure.

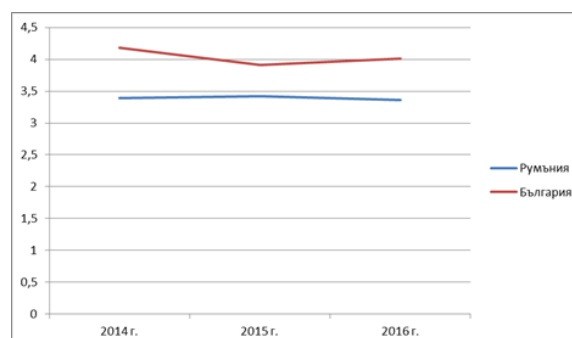
**Figure 5. Assessment of port infrastructure quality in the EU (2015-2016)**<sup>26</sup>



According to Eurostat, the assessment received by Romania for the period 2013-2014 is 3.39; 2014-2015 is 3.42, and for 2015-2016 it is 3.36, which determines the last place in the ranking of Romania.

Bulgaria is just before Romania, with signs of deterioration of the indicators. The assessments it receives are: 2013-2014 - 4.18, for 2014-2015 - 3.91, for 2015-2016 - 4.01.

**Figure 6. Dynamics of the port infrastructure quality index in Bulgaria and Romania**



The density of existing port infrastructure in the cross-border area is high and free port capacity is available. Most of the ports, however, were built at the beginning of the last century, which has a negative impact on their technical condition. The main problems for the development of ports are related to the lack of sufficient investments for maintenance

<sup>26</sup> Source: Eurostat

and development of the port infrastructure in the previous years, outdated basic mechanical and transshipment facilities, poor condition of the quays.

The ports have sufficient capacity to handle bulk, bulk and bulk cargo, container and ro-ro units. At present, around 60% of the infrastructure capacity is used with the available transshipment equipment.

The trend towards port development is related to their concession and the liberalisation of port services, taking into account the need to improve the technical conditions of port infrastructures and waterways.

#### **1.5.5. Sources for financing the construction of waterway transport infrastructure in the cross-border region**

The presentation of funding sources should be linked to the European Commission's strategic initiatives in the field of transport, relevant to the subject of this analysis, in implementation of which different financial instruments and funds have been created and applied.

#### **EU Strategy for the Danube Region (EUSDR)**

The EU Strategy for the Danube Region is the second EU macro-regional strategy adopted by the European Commission in 2010 and endorsed by the European Council in 2011.

The strategy brings together 13 countries along the Danube and covers an area where more than 112 million people live, or one fifth of the EU population. Nine of the participating countries are members of the EU: Austria, Bulgaria, Germany (Baden-Württemberg, Bavaria), Romania, Slovakia, Slovenia, Hungary, Croatia and the Czech Republic. Four of the participating countries are outside the EU: Bosnia and Herzegovina, Moldova, Serbia and Ukraine (Odessa, Ivano-Frankivsk, Chernivtsi and Zakarpattia Oblast).

The strategy focuses on four key points, and within each point priority areas are defined by specific cooperation activities:

***Connecting the region:***

- Improving mobility and transport links
- Promoting wider use of renewable energy
- Promoting cultural and tourism activities

***Environment protection:***

- Recovery and preservation of water quality
- Environmental risks management
- Conservation of biodiversity, landscapes and air and soil quality

***Achieving well-being:***

- Developing the knowledge society
- Supporting the competitiveness of enterprises
- Investing in People and Skills

***Strengthening the region:***

- Stepping up institutional capacity and cooperation
- Work together to promote security and tackle organised and serious crime

The achieved results so far are the following:

- For the past years of EUSDR implementation, it is clear that the strategy is delivering results. Thanks to the strategy, several new major macro-regional projects (for example in the fields of shipping and climate change) have been launched or developed. By bringing together different stakeholders at different levels, the EUSDR contributed to a better culture of cooperation and helped to develop a multicultural dialogue. It also helped to increase coordination and develop synergies between policies and institutions at national level and supported enhanced thematic cooperation with non-EU countries as well as between existing international organisations in the region.



Specific examples:

- Coordinated risk management through projects such as SEERISK significantly reduces the risk of flood damage.
- Some bottlenecks for Danube ships have been removed and navigation security has been improved through projects such as **FAIRWAY** and **DARIF - Danube River Forum. EU Strategy for the Danube Region**
- The cultural dialogue and active participation of young people in civil society in the Danube region are promoted through projects such as “**Empowering Young People - Connecting Europe**”.

### **The “Transport 2050” Strategy**

The “Transport 2050” Strategy is a long-term plan to increase mobility and reduce emissions and dependence on oil. To achieve this, changes are needed in Europe's transport system.

Among the key targets by 2050 are: more cities not driven by conventional fuels; low carbon fuels in aviation; emissions from shipping to be reduced; the carriage of passengers and goods by means of long-distance interurban distances shall be carried out by rail and water transport; and as a result, transport emissions shall drop by 60%. The overall objective is to create a Single European Transport Area with more competition and a fully integrated transport network which links the different modes and allows for a radical change in transport patterns for passengers and cargo. For this purpose, specific initiatives have been identified for the next ten years, one of which is halving the use of conventional fuels in urban transport by 2030 and by 2050 their – their gradual total withdrawal from use in the cities.

The EU's European Regional Development Fund (2014-2020) aims at strengthening economic and social cohesion in the European Union, striking a balance between its regions by concentrating investment on several key priority areas: innovation and research, technologies, support for small and medium-sized enterprises and the low-carbon economy. ERDF actions aim to alleviate economic, environmental and social problems in urban areas with particular emphasis on sustainable urban development.

The EU Cohesion Fund aims to reduce economic and social disparities and promote sustainable development in Member States whose Gross National Income (GNI) per capita is below 90% of the EU average. It provides funding for activities in the areas of: trans-European transport networks on projects of European interest, infrastructure projects, environment - on projects related to energy or transport, provided they have a clear environmental benefit, such as energy efficiency, renewable energy use energy, developing rail transport, supporting intermodality, strengthening public transport, etc.

### **Investment Plan for Europe, Approved by the European Council on 18 December 2014**

The plan is based on three complementary directions:

- *First* – mobilising in the next three years at least 315 billion EUR for additional investments to increase the impact of public funds and unlock private investment;
- *Second* - targeted initiatives to ensure that these additional investments meet the needs of the real economy.

The implementation of the first two strands at EU level will be achieved through the creation of a new European Strategic Investment Fund to provide risk support for long-term investment and to provide greater access to risk finance for SMEs.

*Third* – measures to ensure better regulatory predictability and to remove barriers to investment so that Europe becomes more attractive to investors.

### **“Europe 2020”, Strategy for smart, sustainable and inclusive growth of the European Commission, 2010**

“Europe 2020” is a European Union strategy for growth and jobs, which has been introduced to create conditions for smart - through more effective tools in education, research and innovation; sustainable - thanks to the decisive transition to a low-carbon economy and a competitive industry; and inclusive - with a strong focus on job creation and poverty reduction. It sets out five main targets to be achieved by the end of 2020 in the fields of employment, research and development, climate and energy, education, social

inclusion and poverty reduction. Progress towards the objectives of the Europe 2020 Strategy is promoted and monitored through the European Semester, the annual cycle of economic and budgetary policy coordination in the EU. In 2015, the Council adopted a new set of integrated guidelines - broad guidelines for the economic policies of the Member States and of the Union and guidelines for Member States' employment policies replacing the Integrated Guidelines 2010.

**“Horizon 2020” was set up by Regulation (EU) No 1291/2013 of the European Parliament and of the Council and regulates the rules governing EU aid for research and innovation**

Horizon 2020 is the Framework Programme for Research and Innovation (2014-2020). It aims at improving the European scientific and technological base, making better use of the economic and industrial potential of innovation, research and technology policies in line with the Europe 2020 strategy. To achieve this goal, measures are foreseen under three priorities: “Scientific excellence”, “Industrial leadership” and “Societal challenges”. The programme supports research and innovation through research subsidies, development and innovation grants, procurement and financial instruments.

The sources of funding during the previous programming period (2007 - 2013), as well as in this (2014-2020) and in line with the planned within the framework of the *“Integrated Transport Strategy of Bulgaria until 2030”* and the *“General Master Plan Transport of Romania”* includes funds from an EU grant, complementary funds from the state budget, municipal budgets, government loans and private sector funding.

Sources can be divided into the following groups:

- National funding (national funds);
- European funding (European funds);
- Private funding;
- National funding (local and central budgets);
- Public-private funding;
- Other sources of funding.

For better clarity, and in view of the above-mentioned provisions, sources of funding are addressed in the following groups:

▶ **National public funds:**

- Local budget;
- Central budget;
- National funds.

▶ **External public funds:**

- National operational programmes;
- European funds;
- European programmes.

▶ **Other funding instruments;**

▶ **Private financing.**

## **NATIONAL PUBLIC FUNDS**

### **“STATE INVESTMENT LOANS” PROGRAMME OF THE REPUBLIC OF BULGARIA**

The State Investment Loans Programme is the disposable resource, which is regulated by a corresponding decree on the annual implementation of the state budget of the Republic of Bulgaria and in compliance with the Public Finance Act.

State-guaranteed loans are loans based on financial contracts between the Government of the Republic of Bulgaria and the respective financing institution. State-owned investment loans can benefit state-owned beneficiaries and first-level budget spenders.

## **LOCAL BUDGETS AND STATE BUDGET**

Options for financing Danube port infrastructure projects, river transport including improvement of TEN-T network connectivity are the state and local budgets of the partner countries - Bulgaria and Romania. For example, local but key infrastructure projects can be funded from the budgets of the relevant regions/counties, in line with local government responsibilities for transport development, mobility and connectivity.

The State budget enables, through the budgets of ministries and agencies, regional institutions and public authorities, within their competence and responsibility for the development of inland waterways and port infrastructure, mobility and connectivity to provide assistance for projects of regional, national and cross-border importance.

## **EXTERNAL PUBLIC FUNDS**

### **OPERATIONAL PROGRAMME “TRANSPORT AND TRANSPORT INFRASTRUCTURE” 2014-2020**

Operational Programme “Transport and Transport Infrastructure” 2014-2020 (OPTTI) is one of the ten operational programmes of the Republic of Bulgaria funded by the EU Cohesion and Structural Funds.

The overall objective of the OPTTI 2014-2020 is “Developing a sustainable transport system”. In order to achieve the overall objective of the OPTTI 2014-2020, seven specific objectives have been formulated:

- “Attracting passenger and freight traffic by improving the quality of rail infrastructure on the Trans-European Transport Network”;
- “Removal of "bottlenecks" on the Trans-European Transport Network”;
- “Increased use of intermodal transport”;
- “Increase in metro use”;
- “Improving transport management by introducing innovative systems”;
- “Improving the management of the rail network”;
- “Ensure the necessary conditions for successful completion of OPT 2007-2013 and for implementation of OPTTI 2014-2020, increase of administrative capacity and public support”.

The priority axes of the Programme are:

1. “Development of the railway infrastructure under the “main” Trans-European Transport Network”;
2. “Development of road infrastructure under the “main” and “extended” Trans-European Transport Networks”;
3. “Improving intermodality in passenger and cargo transport and developing

- sustainable urban transport”;
4. “Innovation in management and services - introduction of modernised infrastructure for traffic management, improving safety and security of transport”;
5. Technical assistance.

#### **THE CROSS-BORDER COOPERATION PROGRAMME INTERREG V-A ROMANIA-BULGARIA 2014-2020**

Interreg V-A Romania-Bulgaria 2014-2020 is a programme for cross-border cooperation, co-financed by the European Union with funds from the European Regional Development Fund.

The Strategic Objective of the Programme for the period focuses on the thematic areas of the Europe 2020 Strategy related to climate change, risk prevention and management, conservation and protection of the environment, promotion of resource efficiency, sustainable transport, promotion of employment and mobility of work strengthening institutional capacity by promoting cooperation between citizens and institutions.

The regions, which it covers, are 7 counties in Romania (Constanța, Dolj, Olt, Teleorman, Giurgiu, Calarasi, Mehedinti) and 8 regions in Bulgaria (Vidin, Vratsa, Montana, Pleven, Veliko Tarnovo, Ruse, Silistra, Dobrich).

The projects are funded as follows: 85% from the ERDF, 13% national co-financing from the two partner countries (Bulgaria and Romania) and 2% own contribution.

The selected thematic objectives are formulated in five priority axes: “A Well-Connected Region”, “Green Region”, “Safe Region”, “Qualified and Inclusive Region” and “Efficient Region” that respond to the needs and challenges of the cross-border region.

Beneficiaries under the Programme are national, regional and local authorities as well as public organisations, which is a prerequisite for improving the knowledge and learning of good practices by Bulgarian and Romanian organisations in order to improve their regional and local development policies.

Support in the area of improving the region's connectivity to the TEN-T network can mainly be achieved to establish joint mechanisms addressing cross-border transport issues; facilitating the connection of secondary/tertiary nodes with TEN-T infrastructure; research, strategies and action plans to improve shipping safety on the Danube and the Black Sea;

renovation or improvement of inland waterways, risk management actions and the development and implementation of measures to protect against natural disasters, early warning and response in emergencies; creating or expanding cross-border mechanisms (agreements, networks, regulations, surveys, policies, strategies, information exchange tools) to enhance cooperation capacity.

#### **“DANUBE” 2014-2020 TRANSNATIONAL COOPERATION PROGRAMME**

The “Danube” 2014-2020 Transnational Cooperation Programme is a financial instrument to promote and initiate project ideas related to overcome the common challenges and needs in specific areas to achieve real benefits for people and to build effective links between authorities and organisations in the Danube Region.

The regions covered by the Programme are in the territory of 9 EU Member States: Austria, Bulgaria, the Czech Republic, Germany (Bavaria and Baden-Württemberg), Croatia, Hungary, Romania, Slovenia and Slovakia and 3 candidate countries: and Herzegovina, Serbia and Montenegro. Moldova and four regions of Ukraine (Zakarpattia, Ivano-Frankivsk, Odessa and Chernivtsi) may also participate in the Programme with financing from the European Neighbourhood Instrument.

Beneficiaries under the Programme may be national, regional and local authorities as well as non-governmental and private organisations.

Danube Transnational Programme has four priority axes:

##### ***Innovative and socially responsible Danube Region***

In line with the EU flagship initiative on innovation and the implementation of the Europe 2020 Strategy in the countries of the Danube Region, the Programme pays special attention to a number of innovation topics that are of major importance in the field of cooperation such as eco-innovation, of knowledge, cluster policies, social innovation and qualified entrepreneurship, including aspects of technological and non-technological innovation. The social dimension of innovation (social innovation, educational aspects and entrepreneurial skills) is of great importance. Research and innovation are interlinked with other thematic objectives that are addressed in the Programme.

### ***Environment and culture responsible Danube Region***

Through this priority axis, the Danube Transnational Programme 2014-2020 supports joint and integrated approaches to preserve and manage the diversity of natural and cultural values in the Danube region as a basis for sustainable development and growth strategies. The programme provides for investments in the creation and/or maintenance of ecological corridors with transnational significance in the Danube Region. This intervention is directly related to water management and control of environmental risk factors, such as flood risks. In addition, disaster prevention and management (risk management) is considered related to risks caused by non-functional ecosystems and human-induced changes in climatic conditions.

### ***Better connected Danube region***

Within this priority axis, the Programme addresses common challenges related to environmentally friendly, low carbon and safe transport systems, including inland waterways and ports and multimodal connections, in order to contribute to sustainable regional and local mobility, modal integration and intelligent transport. The programme also aims to support regional connectivity and balanced accessibility of urban and rural areas. Better management of regional mobility and better border permeability at regional level should ensure that urban and rural areas make use of the opportunities created by the major transport networks developed at European level. On the other hand, energy is a typical problem whereby the transnational approach is essential to ensuring security of supply, market integration and more effective regional planning, and to jointly identify the most critical infrastructure developments. Regional energy planning and coordination need to be improved in the Danube region within the wider context of EU energy policy development to ensure the security and efficiency of energy supply. Another aspect is the development of intelligent distribution systems in which the programme area is still in the early stages. The programme aims to contribute within its specific scope to the development of smart energy distribution systems in order to increase the efficiency of the regions' significant investments in renewable energy, energy efficiency and smart grids.



### ***Well-governed Danube region***

Institutional cooperation and capacity is a key objective and a vital element of the Program. Institutional capacity is not only a technical task for training civil servants, but concerns how public authorities interact and provide services to businesses and citizens. “Good governance” is the foundation and ultimate goal of building institutional capacity. Good governance builds trust and social capital. Countries with a high level of social capital tend to achieve better economic performance.

The need for purposeful efforts in the area of good governance has been identified after an analysis to develop the capacity of public authorities and other stakeholders from the public to cope more effectively with the challenges that are of the greatest importance to the region. Establishing institutional cooperation under the Programme should lead to an improvement in the legal and political framework, the development of strategies and action plans, the development of joint capacities and the coordinated provision of services in areas of major societal challenges such as labour market policies, education systems and policies, demographic change and migration challenges, inclusion of vulnerable and marginalised groups, participatory planning process and civil society involvement, cooperation between cities and rural areas and partnership, cooperation in the field of safety, justice and security.

### **“INTERREG EUROPE” 2014 – 2020 INTERREGIONAL COOPERATION PROGRAMME**

The “Interreg Europe” 2014 – 2020 Interregional Cooperation Programme is a tool for implementing the European Union's Cohesion Policy - a strategy for a smart, sustainable and inclusive economy creating high levels of employment, productivity and social cohesion.

The overall objective of the Programme is to improve the implementation of regional development policies and programs, in particular the programmes under the “Investment for growth and jobs” objective and, where appropriate, the European Territorial Cooperation Objective programmes by promoting the exchange of experience and the absorption of policies among participants of regional importance.

INTERREG EUROPE focuses on the entire territory of the European Union, Norway and Switzerland.

In the programming period 2014-2020, the Programme is working on four topics related to regional development: “Research, technological development and innovation”, “Competitiveness of small and medium-sized enterprises”, “Low carbon economy” and ‘Environment and resource efficiency’.

Beneficiaries may be organisations from the 28 EU member states, Norway and Switzerland if they are national, regional or local public authorities, other public law bodies (e.g. universities, regional development agencies, business support organisations, etc.), NGOs.

The specificity of this Programme is that an educational policy platform has been created. The aim is for the entire community of regional politicians to have access and benefit to the general knowledge in the field of the 4 themes of the Programme. The platform creates a space for continuing learning, knowledge transfer, improving Europe's regional policies without engaging in a specific project. It also helps networking and expanding opportunities to set up and manage partner networks, providing expert support.

#### **EUROPEAN STRUCTURAL AND INVESTMENT (ESI) FUNDS 2014-2020**

This includes the Cohesion Fund and the European Regional Development Fund. Due to the high level of knowledge of these two funds, here is the most general information about the two funds.

***The Cohesion Fund (CF)*** is aimed at Member States whose Gross National Income (GNI) per inhabitant is less than 90 % of the EU average. It aims to reduce economic and social disparities and to promote sustainable development. The Fund finances:

- Infrastructure sites from the transport and energy network;
- Environmental protection activities;
- Low carbon economy.

***The European Regional Development Fund (ERDF)*** seeks to strengthen economic and social cohesion in the EU by correcting inequalities between the regions of the Union. The Fund's financial support is to support the following areas:

- Research and development;
- Small and medium enterprises;
- Low carbon economy;
- Transport and energy infrastructure projects.

The ERDF also has a significant contribution to cross-border, transnational and interregional cooperation within the European territorial cooperation objective. Partnerships with third countries neighbouring the EU are also admissible through programmes under the European Neighbourhood Instrument and Instrument for Pre-Accession Assistance.

### **EUROPEAN STRATEGIC INVESTMENT FUND**

The European Investment Fund (EIF) is an essential element of the investment plan for Europe, designed to stimulate economic growth and competitiveness in the European Union in the long term. EFSF envisages the use of a common fund with the EIB, using innovative financial instruments, including bonds and various forms of risk financing instruments. EFSI support can be combined with EU grants through the Connecting Europe Facility (CEF) and Horizon 2020, as well as from ESF funds.

The objective of the fund is to use public funding, including EU budget funding, to mobilise private investment for a wide range of projects in the EU. Projects cover areas such as infrastructure, research and innovation, education, health, information and communication technologies and others.

The Fund is a separate and transparent entity and a separate account managed by the European Investment Bank (EIB). It was created in July 2015 with a special regulation.

Since September 2016, the Council has been working on a new proposal for the European Strategic Investment Fund, which aims to amend the EFSI regulation of 2015.

The fund aims to encourage the participation of private investors in a wide range of new investment projects. To achieve this, he takes part of the project risk through the first loss liability. Based on the existing 16 billion EUR guarantees from the EU budget and 5 billion EUR from the EIB, the aim is to achieve a multiplier effect of 1:15.

At present, the projects cover transport, energy and broadband infrastructure, education, health, research and risk finance for SMEs. EFSI is geared towards socially and economically viable projects without pre-existing sectoral or regional distribution.

### **CONNECTING EUROPE FACILITY**

The Connecting Europe Facility (CEF) was established by Regulation (EU) No 1316/2013 of the European Parliament and of the Council of 11 December 2013 and covers the transport, telecommunications and energy sectors.

The Connecting Europe Facility (CEF) is an essential EU funding instrument for promoting growth, employment and competitiveness through targeted infrastructure investment at European level.

The CEF supports the development of highly efficient, sustainable and efficiently linked trans-European networks in the fields of transport, energy and digital services.

Investments from the CEF fill the missing links in the European energy, transport and digital “backbone”.

MSE is beneficial for people in all Member States as it makes travel easier and more comfortable, improves Europe's energy security while allowing for wider use of renewable energy sources and facilitates cross-border interaction between public administrations, businesses and citizens.

In addition to the grants, CEF offers financial support to projects through innovative financial instruments such as project bonds and bonds. These instruments create a significant leverage in the use of the EU budget and act as a catalyst for attracting additional funding from the private sector and other public sector actors.

CEF has three sectors:

- CEF Energy
- CEF Telecommunications and ICT
- CEF Transport

One of the key priorities of the CEF is to enable and strengthen synergy between the three sectors. Inter-sectoral actions can provide an opportunity to optimise costs or results by pooling financial, technical or human resources, thus increasing the effectiveness of EU funding.

### **CEF Transport**

The Connecting Europe Facility for Transport is a tool to finance the implementation of European transport infrastructure policy. It aims to support investment in the construction of a new transport infrastructure in Europe or in the rehabilitation and modernisation of the existing.

The policy objectives foresee:

- completion by 2030 of the core network, structured around nine multimodal corridors of the core network.
- completing the entire network by 2050 to facilitate access to all European regions.

CEF Transport focuses on cross-border projects and projects aimed at removing bottlenecks or overcoming missing links across the core network and the entire network, as well as horizontal priorities such as traffic management systems.

CEF Transport also supports innovation in the transport system to improve the use of infrastructure, reduce the impact of transport on the environment, increase energy efficiency and increase safety. The total budget for CEF Transport is 24,05 billion for the 2014-2020 period

### **TEN-T**

The TEN-T programme was set up by the European Commission to support the construction and modernisation of transport infrastructure across the European Union.

The TEN-T program provides financial support for the realisation of important transport infrastructure projects, in line with the objective of enhancing European competitiveness, job creation and cohesion.

The projects represent all modes of transport - air, rail, road and sea/inland water - plus logistics and intelligent transport systems and include all EU Member States.

Participation is based on open competitions and offers must be submitted in accordance with the procedure defined in the competition. Eligible participants are legal entities from the EU Member States as well as from the associated countries - Norway and Iceland.

### ***Forms of financial assistance***

#### **▶ *Grants***

The grants are aimed at those projects that receive insufficient funding from the private sector. Grants are between 50% and 100% of the eligible costs.

The value of the equipment and infrastructure that the beneficiary considers as capital expenditure can be considered as eligible expenditure to its full extent.

Grants can not have the purpose or effect of generating profits in the course of the activity (the 'no-profit principle').

#### **▶ *Public procurements:***

Public procurements can be awarded independently by the European Commission or jointly with the Member States.

#### **▶ *Financial instruments:***

The purpose of financial instruments is to enhance the multiplier effect of European Union spending by attracting additional resources from private investors.

The financial instruments support projects of common interest which have a clear European added value and facilitate private sector involvement in the long-term financing of such projects.

*Equity instruments* (e.g. venture capital focusing funds) and debt instruments (loans and/or guarantees backed by risk-sharing instruments, including project bonds) can be used.

## **HORIZON 2020**

Horizon 2020 is an EU Framework Programme for Research and Innovation. It is established by Regulation (EU) No 1291/2013 of the European Parliament and of the Council and regulates the rules governing EU aid for research and innovation.

Horizon 2020 aims at raising Europe's scientific and technological base, making better use of the economic and industrial potential of innovation, research and technology policies in line with the Europe 2020 strategy. To achieve this goal, measures are foreseen under three priorities: "Scientific excellence", "Industrial leadership" and "Societal challenges". The program supports research and innovation through subsidies, awards, public procurement and financial instruments.

## **OTHER FINANCING INSTRUMENTS**

### **WORLD BANK GROUP**

The International Bank for Reconstruction and Development (IBRD) was established in 1945 following the agreement reached at the Bretton Woods Conference of 1944. The IBRD is one of the five institutions that comprise the World Bank Group, the other being: the International Finance Corporation (IFC) established in 1956, the International Development Association (MAD), established in 1960, the Multilateral Investment Guarantee Agency (AMGI), established in 1988, and the International Centre for the Settlement of Investment Disputes (ICSIS) , created IN 1966.

The main forms of support and funding by individual organisations within the World Bank Group are subject to common objectives and priorities: poverty reduction, economic and social development and improved living conditions of the population. This also defines the broad sectoral scope and specificity of the World Bank's funding as well as its role in the international financial community as a group of organisations that cooperate in all sectors of the economy - from infrastructure to the social sphere. When providing financial support, they are guided, in addition to purely commercial and economic criteria for efficiency and return, and criteria linked to stimulating positive reforms and sustainable development. For this reason, in addition to traditional areas, World Bank Group organisations are a major source of funding for both low-cost and non-renewable activities of social value - social

services, healthcare, education, human capital development, environmental protection and others.

IBRD is the main organisation of the World Bank Group and, given the good practice and sound management over the years, has a credit rating of a first-rate borrower, enabling it to finance its operations under the most favorable conditions of the international financial markets. This allows the IBRD to provide relatively subsidiary and more favorable conditions for lending to its member states. The Bank only provides funding to governments and government entities or a state guarantee from the Member State.

The underlying financial conditions under which IBRD credits its borrowers currently include loans with a weighted average maturity of up to 18 years with a total repayment term of up to 30 years, an initial charge and floating interest rates with the option of fixing their individual components or applying instruments currency and other risk management.

IBRD Bulgaria joined with subscribed equity capital of 521.5 million USD (about 0.3% of total subscribed capital). The functions of manager in the World Bank Group for Bulgaria organisations are carried out by the Minister of Finance and the Deputy Governor - Deputy Governor of the BNB.

Support for countries such as Bulgaria and Romania takes place mainly in the form of structural and investment funding provided at state level or under a state guarantee. In addition to the lending, the IBRD provides grants from its own or managed funds and provides concomitant analytical and advisory assistance in separate key areas.

The IFC and AMGI activities in the country from its membership are of varying intensity, aiming at supporting private greenfield investments (including equity participation), investment lending for individual projects in the private sector, and granting of guarantees for foreign investment.

The scope of the investment and the amount of funds is determined by signing a Partnership Framework addressing specific areas in line with identified needs of the partner country. The last funding period is 2017-2022.



## **EUROPEAN INVESTMENT BANK**

The EIB provides funding for projects that help to achieve the EU's objectives within and outside the Union. The EU countries jointly own the EIB. The bank's purpose is:

- to increase Europe's potential in terms of jobs and employment;
- to support actions to mitigate climate change;
- to support EU policies beyond its borders.

The Bank borrows funds on the capital markets and lends them on favorable terms to projects supporting the EU's objectives. About 90% of credits are provided in EU countries. No funds are provided from the EU budget.

The EIB provides three main types of products and services:

- Lending - about 90% of the bank's total financial commitments. The Bank grants loans to customers of any size to support growth and employment, often helping to attract other investors;
- Mixed funding - allows customers to combine EIB financing with additional investment;
- Consultancy and technical assistance - to maximise profitability;
- The EIB directly allocates loans amounting to more than 25 million euro. When it comes to smaller loans, the bank opens credit lines for financial institutions, which then provide these funds in the form of loans.

It takes decisions on borrowing and lending based on the merits of each project and the opportunities offered by financial markets. In the EU, the bank has specific lending priorities. Outside the EU, it supports the Union's development and cooperation policies.

As an independent body, the bank takes autonomous decisions to make and deliver credits. It cooperates with other EU institutions, in particular the European Commission, the European Parliament and the EU Council.

The EIB finances projects in the following priority sectors.

### ***Innovation and skills***

Innovation and skills are key elements in delivering sustainable growth and creating high-value jobs. They play an important role in stimulating long-term competitiveness. For the EIB, this is a top priority and therefore they are a key partner for projects that develop innovation and skills for a developing economy.

### ***Infrastructure***

Infrastructure is a major pillar connecting domestic markets and economies. Infrastructure projects play an important role for economic growth, sustainability and job creation as well as competitiveness.

Accordingly, the EIB as an EU bank places the provision of investment in infrastructure as a top priority. At the same time, new funding models require funding for reasonable and efficient spending. The EIB provides financial support for infrastructure initiatives aimed at improving energy efficiency, transport, water and sustainable urban infrastructure.

### ***Climate change and the environment***

The EIB is also committed to adapting to climate change and mitigating the effects by more than 25% of the total financial resource. For investments in developing countries, this share is projected to increase to 35% by 2020.

At the same time, the EIB provides support to promote environmental objectives in both developed and developing countries. EIB financing supports sustainable projects in over 160 countries and acts as a catalyst for the mobilisation of private funds.

## **EUROPEAN BANK FOR RECOVERY AND DEVELOPMENT**

The European Bank for Reconstruction and Development (EBRD) was established in 1991 with the aim of contributing to economic progress and facilitating the transition to a market-oriented economy in the countries of Central and Eastern Europe that have accepted to observe the principles of pluralist democracy. Its shareholders are 63 countries and 2 inter-state institutions - the European Union and the European Investment Bank. Currently, the EBRD's share capital amounts to 21 billion EUR, and by December 31, 2021, subscription is expected to be subscribed by the shareholders at 9 billion EUR in call-to-

demand shares. The Republic of Bulgaria participates in the EBRD's capital with 165.98 million EUR representing 16,598 shares, each with a nominal value of 10,000 EUR.

Through its activities, the EBRD supports the building of market economies in 29 Central European countries to Central Asia, becoming the largest unilateral investor.

Through its activity and investment policy, the EBRD supports and supports the implementation of structural and sectoral reforms in the countries of activity, the development of competition, the stimulation of privatisation and private initiative and the development of the infrastructure needed to support the private sector. EBRD mainly invests in private enterprises, usually in common with other trading partners. 87% of the EBRD projects are in the private sector. In the public sector, the EBRD provides funding for major infrastructure projects. The Bank also works with public sector enterprises to support privatisation, restructuring state-owned enterprises, and improving municipal services.

The EBRD has a wide range of financial instruments tailored to specific projects. The main instruments are loans, investments and guarantees.

Loans are provided in any currency widely traded on major world financial markets, or sometimes in local currency, of the borrower with fixed or floating interest rates under particularly favorable terms. The Bank's high credit rating (Standard & Poor's AAA by Moody's and AAA by Fitch) enables it to provide loans that best meet the requirements of the international markets by providing the most competitive its customers. The EBRD provides loans at a minimum of 5 million EUR with a repayment period of between 1 and 15 years, with a grace period when necessary. Typically, the Bank finances up to 35% of the total project cost.

## **PRIVATE FUNDING**

Private funds are funds from private banks, funds, initiatives, projects and funds from private companies and non-governmental organisations.

### **1.5.6. Funding of port infrastructure through CEF**

CEF is one of the specialised tools for financing the construction and development of port infrastructure in the EU countries. That's why its use deserves special attention. This section examines the participation and success of the projects presented by the port authorities and

the link between the requested and the allocated funding. The data used for the analysis are of the Executive Agency for Innovation and Networks of the European Commission (INEA) and supplemented with other public data.

The results of twelve invitations from 2014 to 2017 are included in the analysis. They include all Multiannual Invitations, Announcements, General and Cohesion Calls. Given the limitations of the available data, the analysis focuses on the proposals presented by the port authorities as lead candidates.

In addition to leading coordinators, the port authorities have participated in additional proposals and have benefited from funding from projects promoted by third parties (e.g. maritime administrations, private companies, etc.).

Financing large-scale infrastructure projects clearly has a positive effect on the efficiency, safety, security and environmental friendliness of transport, which contributes to competitiveness and the development of trade both within and outside the EU.

Thus, EU funding for such projects is clear and in the interest of European ports. However, the focus of this analysis is on the projects presented by the Port Authorities as the coordinating applicant as they are the organisation responsible for most of the investments in the port infrastructure.

**Table 6. Results of the participation of port management authorities as candidates under the CEF calls for 2014-2017**

Calls under CEF for 2014-2017	Maximum budget (€)	Proposals by PMAs	Financed proposals	Allocated funds (€)	% of financing
Call 2014	11.930.000.000	95	30	524.513.401	4%
Call 2015	7.560.000.000	40	14	187.925.504	2%
Call 2016	1.939.500.000	26	12	64.847.407	3%
Call 2017	1.000.000.000	7	6	83.216.772	8%
<b>Total</b>	<b>22.429.500.000</b>	<b>168</b>	<b>62</b>	<b>860.503.084</b>	<b>4%</b>

Source: Based on INEA data and publicly available information.

From 2014 to 2017, around one third of port projects submitted by Port Authority (MAs) have been able to raise funds from the CEF. A total of 168 proposals were submitted by the port authorities. These proposals concern one of the following modes of transport: ports, sea ports, multimodal, rail, inland waterways, roads. 62 of these proposals received funding. More than half of the proposals submitted by the port authorities (87 proposals) received a negative assessment of at least one of the four external assessment criteria (relevance, maturity, impact, quality).

Only 19 proposals (11%) did not receive funding because of budget constraints, although they were positively evaluated by external experts and by the Commission. Port Authority authorities have applied for € 2.5 billion between 2014 and 2017 and have received € 860 million, representing 35%. This represents 4% of the available funding under the CEF for the period.

### **Results by countries**

The assessment of the allocation of EU funds allocated to the port authorities by country is given below. This analysis has two limitations. Firstly, it only takes into account the 62 successful proposals submitted by the port authorities and thus excludes funding requested by the ports through projects submitted by other partners. Secondly, one third of successful proposals (22 out of 62) are beneficiaries - port authorities, shipping lines, terminal operators or others. There is no public data on the separation of funding between partners. For the analysis, the funding is distributed equally among the participating Member States. This information is obtained in the table below.

**Table 7. Distribution of the funds, allocated to port infrastructure management authorities by countries, in euro**

Countries	2014	2015	2016	2017	Total	Share
France	155.761.026	539.880	0	0	156.300.906	18%
Poland	13.238.184	118.713.559	477.870	19.914.950	152.344.563	18%
Croatia	30.222.600	32.841.238	35.205.931	0	98.269.768	11%
Spain	72.871.645	7.424.352	647.500	2.169.444	83.112.941	10%
Italy	18.956.743	5.380.450	1.415.650	39.546.444	65.299.287	8%
Netherlands	59.892.118	0	321.065	0	60.213.183	7%
UK	44.368.443	0	0	0	44.368.443	5%
Ireland	38.518.056	0	0	4.477.600	42.995.656	5%
Sweden	22.412.874	0	8.699.685	10.388.333	41.500.893	4%
Finland	17.925.000	0	8.742.500	6.720.000	33.387.500	2%
Slovenia	13.655.743	1.743.533	0	0	15.399.276	2%
Estonia	14.650.000	0	0	0	14.650.000	1%
Germany	8.692.050	0	2.410.685	0	11.102.735	1%
Romania	0	10.791.706	0	0	10.791.706	1%
Greece	0	5.308.783	1.415.650	0	6.724.433	1%
Portugal	4.123.485	2.322.672	0	0	6.446.157	1%
Lithuania	5.097.621	0	0	0	5.097.621	0,4%
Denmark	1.452.070	0	1.890.000	0	3.342.070	0,4%
Cyprus	2.675.743	0	441.920	0	3.117.663	0,3%
Bulgaria	0	2.859.330	0	0	2.859.330	0,3%
Malta	0	0	2.857.887	0	2.857.887	0,3%
Belgium	0	0	321.065	0	321.065	0,04%
Latvia	0	0	0	0	0	0
<b>TOTAL</b>	<b>524.515.415</b>	<b>187.927.519</b>	<b>64.849.423</b>	<b>83.218.789</b>	<b>860.503.083</b>	

Source: Analysis, based on the INEA data and publicly available information.

The port authorities in Bulgaria and Romania have a higher co-financing rate (85%) from the CF in the CEF calls.

It can be noted that the allocation of country grants is quite uneven and some ports have received a large share of funding, while in other large ports, the funding allocated to port management is very limited. This may be partly related to the differences in port management, as some port authorities are responsible for more investment in port infrastructure than others - and thus are more likely to apply for and receive gratuitous funds.

**Table 8. Number of successful projects by countries**

Страна	2014	2015	2016	2017	Общо проекти
Italy	4	2	1	4	11
Spain	3	4	1	2	10
France	9	1	0	0	10
Sweden	5	0	3	2	10
Poland	3	3	1	2	9
Croatia	1	3	3	0	7
Ireland	4	0	0	2	6
Finland	2	0	2	2	6
Portugal	3	1	0	0	4
UK	3	0	0	0	3
Slovenia	2	1	0	0	3
Greece	0	2	1	0	3
Cyprus	1	0	1	0	2
Denmark	1	0	1	0	2
Germany	1	0	1	0	2
Estonia	1	0	0	0	1
Lithuania	1	0	0	0	1
Romania	0	1	0	0	1
Bulgaria	0	1	0	0	1
Malta	0	0	1	0	1

Netherlands	1	0	1	0	2
Belgium	0	0	1	0	1
Latvia	0	0	0	0	0

Source: Analysis of the INEA data and publicly available information.

From the analysis of the results of previous invitations, the following conclusions can be drawn. Firstly, port authorities, which, although having significant investment needs, receive only 4% of the funding available for the CEF between 2014 and 2017. Port authorities apply for funding primarily for maritime transport projects, but also seek funding for rail, road, inland waterways and multimodal projects.

Secondly, the distribution of grants to port authorities is uneven across time and between Member States. 61% of the funding provided to the port authorities was made available in 2014, reaching 83% in 2015. Funding in 2016 and 2017 represents only 17% of the funding allocated to port authorities between 2014 and 2017. Six countries concentrate 72% of the funding allocated to the port authorities between 2014 and 2017. While in some cases the funding is distributed among a number of projects, in other cases several large projects receive a large share of the total funding of the port authorities.

Bulgaria and Romania have a modest participation in the use of the CEF capabilities. During the analysed period, only one project was implemented in both countries. Its value in Romania is 10.8 million EUR, and in Bulgaria - 2.9 million EUR, which is an insignificant part of the total absorbed budget of the Facility.

## **2. State of the navigation system in the Romania-Bulgaria cross-border region**

Navigation along the Danube River is to be understood as a system of inseparably interconnected individual elements. These elements include Danube waters, vessels and their cargo (types of goods), ports as centres linking inland navigation to road and rail transport modes, River Information Services (RIS) along with the legal and policy framework. The potential of shipping on the Danube can only be fully realised when there is achieved interaction of all these elements.



## **2.1. Infrastructure for provision of river information services in Bulgaria**

### **River Information Systems <sup>27</sup>**

River Information Systems (RIS) are navigation systems serving ships and institutions responsible for traffic management, waterway maintenance, shipping safety, environmental protection, and more. Traditional communication between ships and the various coastal services serving shipping has been done through radio, telephony, visual observation and other methods. RIS is an environment in which modern electronic navigation can be implemented, which is a practice in maritime transport. In view of the communications applications under which the River Information Services system functions, it can be determined that they are essential for ship crews as well as for transport and port operators, where the importance is reduces the amount of variable costs and improves the processing and transmission capacity of ports.

### **The BULRIS system<sup>28</sup>**

Traffic monitoring systems that integrate into BULRIS provide real-time information both to coastal services and the necessary data for safe sailing ships: AIS data, radar picture and video surveillance with thermo picture option.

- Upper Fairway Data (Inland Waterway) - Inland Electronic Navigation Cards, Internet Ship Ship Notifications, On-Route Radar Systems, Sailing Planning;
- Information on current legislation - a mode of navigation on the territory of each Party;
- Hazards on the waterway/disaster signals;
- Shipping and logistics information on arrival date, type of cargo, free ship volumes;

---

<sup>27</sup> <http://www.bulris.bg/project-bulris/system-bulris>,

<sup>28</sup> <http://www.bulris.bg/project-bulris/system-bulris>,

- Traffic Control - ensures safety and security of shipping and delivery. Provides Electronic Ship Reports, Vessel Monitoring and Tracking, Automatic Identification (AIS).

The Regulation on the provision of river information services on inland waterways of the Republic of Bulgaria (as amended in 2014) transposes into Bulgarian legislation the requirements of Directive 2005/44/EC of the European Parliament and of the Council of 7 September 2005 on the harmonisation of the River Information Services (RIS) on inland waterways of the Community.

Directive 2005/44/EC lays down the obligation to implement four key RIS key technologies:

- Visualisation of electronic charts – Inland ECDIS;
- Electronic ship reporting – ERI;
- Notices to Skippers – NtS;
- Vessel Tracking and Tracing system – VTT;
- Special elements of the system are Hull Data Base and RIS Index.

In addition, the Directive states that Member States must meet a set of minimum data requirements, all data on inland navigation and inland navigation planning. These data shall be provided in accessible electronic format and shall contain at least the following:

- Fairway axis with kilometre indication;
- Limits for ships or gears in terms of length, width, displacement and height;
- Working time of restraining structures, in particular locks and bridges;
- Location of ports and transshipment sites;
- Reference data for water level sensors related to navigation.

### *Elements of the system*

All elements of BULRIS are fully compatible with analogous systems in other Danube countries in implementation of Directive 2005/44 / EC.

### *Notices to Skippers - NtSNtS*

Notices to Skippers is part of the BULRIS system. The Notices are key RIS technology that is standardised and is available in 12 different languages. The messages provided are related to notifications from responsible institutions regarding restrictions, limitations and river features or section of the river, fairway maintenance, traffic information, hydrographic information, weather conditions, water level, ice-water. Automatically gathering information from pings and weather stations saves time, human labour and mistakes.

The “Notices to Skippers” subsystem is related to similar systems in other countries and provides search and display of messages for the relevant parts of the Danube River and other River Channels. The address of the subsystem is: <http://nts.bulris.bg>

### *Electronic reporting (ERI)*

Another key technology for RIS services is Electronic Reporting - ERI. It provides strategic traffic information, traffic management, disaster prevention assistance, statistics, waterway and port fees, logistics.

BULRIS supports:

- Web based application for introducing Electronic reports for registered users;
- Interfaces to external applications for ERI;

Electronic reports can be completed and sent by both the captain and an agent.

The provisions of the Ordinance on Provision of River Information Services on Inland Waterways of the Republic of Bulgaria establish compliance with the requirements of Implementing Regulation (EU) No 689/2012 and Implementing Regulation (EU) No 909/2013. Masters and crew must, before entering the harbor of a port, and in accordance with the procedure laid down in Art. 14, para 1 and 2, to inform the Maritime Administration Executive Agency of their intentions through an electronic report (ERI) or by radio-telephone connection of the declared information and navigation channel communicating the name, the flag of the ship, the number vessels, the size and maximum

drafting of the composition, the speed and direction of voyage and the presence of dangerous goods - by type, class and quantity.

The ERI system is available via the Internet at the following address: <http://eri.bulris.bg> and contains the following services and work standards:

- International data exchange across borders;
- Web services R2D2;
- ERINOT XML based ERINOT XSD, version 1.2g.

#### *Vessel Tracking and Tracing system (VTT)*

In relation to the requirements of Directive 2005/44/EC on the Deployment and Application of Harmonised River Information Services and Systems, the visualisation of ship traffic is implemented through the Internet-based software <http://vtt.bulris.bg>, which provides the following information and services for shipping:

- Current fairway data (waterway);
- Location of river and shore signs;
- Hazards on the waterway;
- Distress alerts;
- Transport and logistics information.

The web graphical user interface is the user interface of the AIS subsystem. The AIS Web server is designed to supply the user with the data available in the AIS subsystem. The cards used on the AIS Web server meet the S-57 Inland ENC standard and can be updated.

The programme offers a combination of data from multiple sensors and overlays them and depicts them on S-57 standard electronic cards. Sources of information are radars, AIS base stations, CCTV cameras, FM radio stations).

**Diagram 8. Vessel Tracking and Tracing system**



**VTT km 487 - 499**

**VTT km 562-568**

### **National Reference Data Management System (NRDMS)<sup>29</sup>**

The RIS index of each country describes the objects on the waterways, such as locks, bridges, ship stands, etc.

Reference data is required to create notices to skippers (NtS), in accordance with the Standard Notices to Skippers Standard Edition 2.0. The data is integrated with ERDMS, providing functions for creating new, changing existing data, obtaining changed data in accordance with the procedures described in the document “European RIS Data Management Services” under the PLATINA project.

For Bulgaria, the RIS index is issued by the EA “Exploration and Maintenance of the Danube River” as an obligation under the Ordinance on Provision of River Information Services on the Inland Waterways of the Republic of Bulgaria and is publicly available to all.

The BULRIS system provides an up-to-date national RIS index for the Bulgarian part of the Danube River. Users can download it in Excel format.

The National RIS Portal is integrated with the National Reference Data Management System (NRDMS), from which the current version of the RIS index is produced. NRDMS is available at <http://nrdms.bulris.bg>.

---

<sup>29</sup> [http://www.bulris.bg/river-information-services/national-reference-data-management-system-\(nrdms\)](http://www.bulris.bg/river-information-services/national-reference-data-management-system-(nrdms)), accessed on 07.07.2017

## **National Electronic Document Processing System (Single Window)<sup>30</sup>**

SE “Port Infrastructure” put into operation from March 15, 2017 the electronic document processing system on the arrival and departure of ships in/from our river ports.

The “Single Window” or “One-Stop Shop” system allows standardised information and documents to be submitted electronically and not in paper form to a single entry point. The system is in accordance with Directive 2010/65/EU of the European Parliament and of the Council of 20 October 2010 on reporting of ships arriving and departing from ports of the Member States of Decree No 242 of 04.08.2014 amending and supplement to the Ordinance on Provision of River Information Services on Inland Waterways of the Republic of Bulgaria, adopted by Decree No. 329 of the Council of Ministers of 2007 (State Gazette No. 3 of 2008), Art. 9, para. 1 and the Ordinance.

### **2.2. Establishment of river information system in Romania**

In implementation of the country's commitments under Directive 2005/44 / EC of the European Parliament and of the Council of 7 September 2005 on the Harmonisation of River Information Services (RIS) on the Inland Waterways of the Community, a project to build a monitoring system traffic RoRIS<sup>31</sup> is in the process of implementation.

The River Information System in Romania (RoRIS) is a complex system for monitoring and managing the traffic of ships in the Danube River sector in Romania. The system complies with the standards of Directive 2005/44/EC, which entered into force on 20 October 2005.

The general objectives of the Romanian RIS of the Danube are:

- improving the safety of river navigation and the effectiveness of internal traffic;
- minimising marine incidents, reduce pollutant emissions and environmental hazards;
- maximising the effective capacity of waterways and the capacity of the vessels to be transported;
- ensuring effective use of ports and terminals;

---

<sup>30</sup> [http://www.bulris.bg/river-information-services/sistema-za-elektronna-obrabotka-na-dokumenti-na-reka-\(single-window\)](http://www.bulris.bg/river-information-services/sistema-za-elektronna-obrabotka-na-dokumenti-na-reka-(single-window)), accessed on 07.07.2017

<sup>31</sup> <http://www.roris.ro/portal/prezentare-ris/sistem-ris.aspx>

- achieving maximum security for passengers, crew, ships and freight.

The system is organised in accordance with the organisational structure of the Romanian Naval Service. Her headquarters are in Constanta. At the regional level, the Office has offices in Drobeta Turnu Severin, Giurgiu, Galați, Tulcea and Sulina.

The aim of the project is to develop an information system for the whole length of the Danube, which should fully comply with the European Directive 2005/44/EC (RIS Directive). Phase II will also connect to similar systems in Austria, Hungary, Slovakia, Bulgaria and Serbia.

The project is part of TEN-T or Priority Axis 3, Key Area of Intervention 3.2 “Improving safety in all modes of transport”, aimed at ensuring European safety and security standards in shipping as well as improving the information system Traffic Management of Vessels (VTMIS) and provision of River Information Services on Romanian Waterways.

The districts covered are: Constanța, Tulcea, Galați, Braila, Calarasi, Yalomitsa, Giurgiu, Teleorman, Dolj, Olt, Mehedinci, Caraș-Severin.

Funding of the system is provided by state subsidies through the MA within the Sectoral Operational Programme - Transport, Priority Axis 3 - Modernisation of the Transport Sector to Protect the Environment, Human Health and Safety of Passengers.

The project financing contract was signed on October 29, 2009 with a total value of 49,989,094 lei, of which the total eligible value was 42,007,642 lei.

Project objectives:

RIS systems have three main objectives:

- transport must be safe (it includes minimising the number of accidents and incidents during the trip);
- transport must be effective (maximum increase in capacity for efficient water transport, increase vessel capacity, reduce travel time, reduce transport costs, reduce fuel consumption, reduce consumer efforts to work with RIS, effective

connections and economic modes of transport, efficiency of work in ports and terminals);

- transport must protect the environment (reduce environmental hazards and reduce pollution due to accidents, illegal activities and normal operations).

These objectives are reinforced by the fact that the services provided by the RIS systems will have to be reliable, effective and comply with the law.

Specific objectives for the project:

- providing RIS management and information services for inland waterway traffic complying with the requirements of the RIS Directive EC/44/2005 and related regulations;
- Increase in human and cargo traffic on inland waterways by reducing negative externalities of river transport due to reduced casualties and accidents, which reduces travel and costs.

Creating a single area of inland waterway transport by providing for European-level harmonisation and achieving interconnection of national RIS centres.

The RORIS II project falls under Priority Axis 3, KAI 3.2, which aims at “safer navigation by improving the vessel traffic management system and by river information services on Romanian waterways”. At present, the Romanian Naval Service is implementing RORIS II.

The objectives of the RORIS II RIS project, aligned with the requirements of European Parliament and Council Regulation (EC) No 44/2005 and the European Commission's specific regulations under this directive, are:

- increasing transport safety by increasing the length of waterways with automatic identification and localisation; increasing the number of RIS support requests;
- increasing the efficiency of transport by increasing the number of stationary stations for the identification and identification of ships; increasing the number of VHF radio stations communicating with ships.



### **Architecture of the RORIS II system**

One of the main tasks of the project is to ensure the interoperability and operational harmonisation of the systems that are part of the RIS concept by developing a system architecture based on Directive 2005/44/EC and the results of the European research and development projects (IRIS I, IRIS II, GIS Forum, Platinum, etc.).

The RoRIS system has a hierarchical functional structure built on the following levels:

- Local level - Local Centres - to ensure the initial collection of sensor data, the receipt of data from different users, the transfer of data to different users and the transmission of data to the next level at the regional level;
- Regional level - Regional Centres - receives local data, filters duplicate data, transmits data at national level, provides regional coordination and establishes links between regional centres;
- National level - a national centre that collects data at a regional level, ensures the coordination of the whole system, exchanges information with other organisations, provides external interfaces for other applications;
- Terminals at the Ministry of Transport.

The RORIS II system develops a sensor network of AIS (automatic identification), radar and video surveillance. The concept and structure of the communication support network is completely redefined by digitally transferring all the information (including voice messages) into IP technology (Internet Protocol).

All of the information is transmitted directly or via radio sensors for sensors to communication nodes at local, regional, and central stations. The communication of information between all these communication nodes is via an external telecommunication service provider.

### **Components of the RORIS II system**

The sensors used in the system are Radar, AIS, CCTV.

AIS network

The new RoRIS system aims to extend existing AIS services to cover as much as possible the Danube River.

The system will be structured on three levels: base stations at the local level or isolated points along the Danube; four regional centres in Drobeta Turnu Severin, Giurgiu, Galați, Tulcea; National Centre in Constanța.

#### Radar sensor

The purpose of radar equipment is to monitor and control the traffic 24 hours/7 days in the areas where the sensors will be located. Radar sensors will be placed in the following locations: Moldova Veche, Orshova, Drobeta Turnu Severin, Giurgiu, Oltenita, Calarasi, Negru Vodă, Braila, Galați, Galați - Grindu, Galați - Prut, Tulcea and Sulina.

#### Day and night video sensor

Video sensors will allow observation of areas of interest for daytime and nighttime conditions at distances of 30 to 4,000 metres. The places where the video sensors will be installed are: Moldova Veche, Orshova, Drobeta Turnu Severin, Calafat, Giurgiu, Calarasi, Negru Voda, Braila, Galati, Galați - Grindu, Galați - Prut, Tulcea and Sulina.

#### Meteo stations

Weather stations will be installed at any location where there is an ECDIS operator console. Within the regional centres a single meteorological station will be installed, the information of which will be shown to two operators: local and regional. Weather stations will be equipped with wind sensors (direction and speed), air temperature (degrees Celsius) and visibility (MOR).

#### The ECDIS River Basin Management Desktop Application

The ECDIS application is an integral part of the core of the entire system, integrating information from all system sensors.

## VHF Voice Communication Network

The VHF radio network supports many of the RIS services that are used for:

- Waterway information services on temporary obstacles to navigation; faults in navigation aid equipment; short-term changes in working time for locks and bridges; navigation limitations due to floods and frost; current and future water levels at critical points; disaster relief services (coordination of patrol vessel assistance, incident information, patrol vessels information, police ships and special interventions, etc.);
- Mobile locking and bridge management services;
- Travel planning services; support services for law enforcement and rules in the following aspects: border management, compliance with traffic safety requirements and compliance with environmental protection requirements.

The vessel communication system under the Danube Radiation Regulation will have two functional levels:

- Local level - ships can communicate with each other and with the local RIS operator; communication with the ships will be carried out by the operators of the local centre in the area covered by this centre.
- Regional level - The Regional Operator of RIS may communicate with any ship within its jurisdiction.

For the VHF Voice System, there will be four regional centres, each of which has a number of local centres in subordination. The four regional centres are Tulcea, Galați, Giurgiu and Drobeta Turnu Severin. A similar system will be installed in the VTMIS to the Danube-Black Sea Canal. Each of the four regional centres works independently of the other three.

Services provided by the RORIS II system

Applications for RIS support services:

- electronic reporting of trips;
- advice to seafarers;
- statistics on ship traffic;
- ship registration/tracking application - is a flexible and fast tool that provides an overview of the Romanian flag vessels and their development over time in terms of technical characteristics and legal status;
- application/personal navigation database - develops a computerised work environment in the field of electronic document management and archiving, providing a solid platform for managing and archiving documents and records;
- database database application of the hull;
- disaster relief services;
- the request for a dangerous goods vessel.

#### Interface with other systems/institutions

##### Interface for data transmission to Border Police

A link will be made between RoRIS and the Danube River Border Surveillance System in one place, namely between the RoRIS Central Office and the Regional Border Police Directorate Constanta.

Within RoRIS an interface will be created to ensure the transmission of the following data:

- tracking and location data
- real time vessels (AIS and radars);
- passenger and crew lists;
- load information;
- dangerous goods
- statistics and analyses;
- sensor information: radar, AIS;
- other information from the ANR management:
- Ship information database, owners, etc.

- seafarers database.

In RoRIS, a separate consumer category has been created for the Lower Danube Administration - Galați (AFDJ) where the institution provides public data on the Danube River level, forecast for the next 2 days by locations, minimum depths by sector, and hydrometeorological newsletter<sup>32</sup>. At present, information on the level of the Danube River is provided by AFDJ and on the site of the Lower Danube River Administration - Galați<sup>33</sup> on the basis of Article 23 of the Convention on the Navigation of the Danube River, signed in Belgrade on 18 August 1948 and containing the main provisions on river navigation.

In 2010, the Danube Commission issued ***"Special navigation rules for the Danube River sector, located between the Sulina River and the Braila Harbor (km 175)"***. These "Special Navigation Rules" apply to the Lower Danube from Braila (175 km) to the Sulina River and are mandatory for all captains of vessels irrespective of their flag flying in the Lower Danube sector between Braila (km 175) and Sulina river. Along with this, vessels are required to have the lights and signals prescribed by the International Rules for Preventing Collisions at Sea.

### **Navigation equipment of the inland waterways**

Inland waterways are all rivers, lakes, reservoirs and canals on which ships can fly. On them, navigation is allowed not across the width, but only at the largest depth of the water space prepared for navigation and marked with navigational signs.

Navigation equipment on inland waterways serves to create safe conditions for sailing on ships. It is a system of shore and floating navigation signs. They serve to indicate the sides of the waterway (fairway) and its axis, the places to turn, the berths.

---

<sup>32</sup> <http://www.roris.ro/portal/cale-navigabila.aspx>

<sup>33</sup> <http://www.afdj.ro/en/content/danube-water-level>

## **Riverbank sign equipment**

When it is necessary to be the axis of a long straight stretch of the waterway (fairway) or to direct the ship (the composition) on a specific path, use signs. They are linear (axial) and encircling.

Linear navigational barriers consist of two front and rear signs of the same shape, located one behind the other, the forward mark being less than the hindquarters, and are a continuation of the axis of the shipping route.

The Romanian Naval Authority is the specialised technical body subordinate to the Ministry of Transport and Infrastructure through which the Ministry performs its function as a state authority in the field of maritime safety.

The main tasks of the Romanian Naval Authority regarding shipping safety and environmental protection are the following:

- inspection, control and monitoring of shipping in Romanian sea water and inland waterways;
- fulfillment of the obligations assumed by international agreements and conventions from Romania;
- representing the Romanian government within the international organisations in the field of maritime transport;
- observing the application of the rules, regulations and international conventions of the European Union in the Romanian legislation;
- developing, approving and presenting draft laws and mandatory standards for approval by the Ministry of Transport and Infrastructure;
- performing port state control;
- coordinating of pollution prevention and response activities in Romanian navigable waters and actions to be taken in the event of navigational accidents and casualties;
- water protection against pollution from ships;
- sanctioning of violations and investigation of pollution and navigational accidents;
- technical surveillance and certification of marine and inland waterways, offshore drilling or other military equipment flying the Romanian flag;

- overseeing the compliance of Romanian naval transport with the provisions of the ISM Code and the ISPS Code.

The Romanian Naval Authority has also been designated to fulfill its obligations under Directive 2002/59/EC (VTMIS Directive), Directive 2000/59/EC (Ship and Port Facility Management) and Directive 2005/44 EC (RIS Directive). As a result, VTMIS, RoRIS, AIS, SafeSafeNet, CleanSeaNet, LRIT and other services and systems related to shipping safety, the environment, passengers, ships and cargo on sea and inland waterways.

### **2.3. Institutions responsible for providing navigation safety in Bulgaria**

The waterway in the Danube River section from km 845,650 to km 374,100 is maintained by the competent Bulgarian and Romanian authorities as provided for in an agreement between the governments of both parties.

Navigational provision of navigation in the inland waterways of the Republic of Bulgaria, with the exception of the shipping route, is carried out by the State Enterprise “Port Infrastructure”. Navigation in the Bulgarian section of the shipping route is provided by the Executive Agency “Exploration and Maintenance of the Danube River” (EAEMDR).

EAEMDR performs functions in accordance with domestic and international law concerning the servicing, exploration and maintenance of the conditions for navigation in the inland waterways of the Republic of Bulgaria.

The agency conducts its activity by:

- Provides the navigational-traffic situation in the Bulgarian-Romanian section of the Danube from km 374,100 to km 610,000;
- studies and studies the hydromorphological and hydrological regime of the Danube River in the Bulgarian section as follows: fluctuations at the water level; the temperature of the water; speed and direction of flow; flow of the river; ice regime; erosion of shores and islands; the formation of sand deposits and islands;

- collect and disseminate information on the condition of the waterway and the hydrometeorological regime of the river;
- studies the hydromorphological and hydrological regime in the area of the hydrotechnical facilities in the Bulgarian-Romanian section of the river Danube and organises unimpeded navigation in the region of the Ruse- Giurgiu Bridge;
- provides information on river research;
- notify the relevant authorities, ministries and agencies of taking precautionary measures in the event of floods, coastal erosion, ice phenomena, oil spills and others;
- study and coordinate the projects for construction of the hydro-technical and infrastructure projects, which are carried out on the river;
- coordinate the deployment of technical facilities in the riverbank in terms of shipping, shore and island destruction;
- performs hydro-meteorological observations in the Bulgarian section through the stations Novo Selo, Lom, Oryahovo, Svishtov, Ruse and Silistra and announces storm warnings for the provision of navigation;
- implements projects to maintain and improve navigation conditions along the Danube;
- participates in the localisation and liquidation of pollution from shipping activities in the common Bulgarian-Romanian section of the river;
- Issues short-term forecasts of the water levels and ice phenomena along the river in its common Bulgarian-Romanian section;
- Issues schemes for the extraction of deposits and deposition of deposits in the Danube river bed;



- provides the necessary information for the needs of the Bulgarian river information system;
- monitors the quantity of Danube waters.

In order to ensure the safety and security of shipping on the Danube, the Agency carries out the following actions:

- continuous monitoring of the state of the river;
- timely removal and restoration of the damaged navigation signs and maintenance of the shipping route in accordance with the requirements and recommendations of the Danube Commission;
- provision of operational information on the gauge of the shipping route;
- making corrections along the fairway;
- maintaining a working navigable waterway environment in the Bulgarian section of the Danube River;
- drawing water images of the risky segments of the gallows for shipping;
- Issuing a newsletter for the navigation and navigation conditions, notifications to the shipowners and daily broadcasting of “Hydrometeorological newsletter”;
- conducting hydrographic measurements in the critical sections for the shipping and for the security of the Ruse-Giurgiu Bridge;
- continuous monitoring of hydromorphological changes, disclosure of critical shipping areas (river thresholds) and appropriate measures;
- measurement of water quantities with Doppler technology;
- daily dissemination of water level forecasts for hydro-meteorological stations Ruse and Silistra;
- performing meteorological, climatic and meteorological observations;
- issuing permits for use of a water body for extraction of sediment deposits from the Danube River;

- maintaining the conditions for timely localisation and liquidation of potential oil spills;
- Creating an optimal organisation to timely forecast the nature and consequences of disasters, accidents and accidents.

Changes in the navigation situation and special temporary prescriptions to ensure the safety of inland waterway navigation are disclosed in “Notices to Skippers” on the website of the Bulgarian River Information Services <http://nts.bulris.bg/>. Skippers and crews are required to observe the waterway gauges posted in the “Notices to Skippers” and not to pass through critical stretches of water that exceeds what has been announced.

The terms and conditions for the sailing and the border regime in Bulgarian and foreign yachts, boats and other vessels for sport, tourism and entertainment, as well as the provision of water services with them in the internal sea waters, in the territorial sea and in the inland waterways of the Republic of Bulgaria are defined with Ordinance of the Council of Ministers of the Republic of Bulgaria /adopted by Decree of the Council of Ministers No 293 of 07.12.2009 and Prom. - SG, No. 99 of 15.12.2009)/.

In February 2018, in Ruse, Bulgaria and Romania signed an Agreement on the terms and procedure for performing joint inspections of inland waterway vessels in the Bulgarian-Romanian section of the Danube River.

The document is a result of the implementation of activities under the project “Development of a common database and legal framework for ship inspections carried out in the joint Bulgarian-Romanian section of the Danube through an interface to the national river information system (RIS)” - DANRiSS, financed under the Programme for cross-border cooperation INTERREG V-A Romania-Bulgaria 2014-2020 (brief description is provided below in this report).

By signing the Agreement, Bulgaria fulfills the requirements set out in Art. 17 of the Directive of the European Parliament and of the Council of 12 December 2006 laying down technical requirements for inland waterway vessels and repealing Council Directive 82/714/EEC (2006/87/EC).

## **2.4. Institutions responsible for improvement of navigation safety in Romania**

From the Romanian side “Lower Administration of the Danube” – Galați <sup>34</sup> (AFDJ) operates as an autonomous state control and is the body for waterways for the Romanian Danube River sector from the border line - km 1 075 to the mouth of the Black Sea, Sulina branch, Sulina River. These include the shipping branches of the Danube, Borcea, Bala, Măcin, Vâlcu, Calea, branch Chilia with its secondary branches, the canal of Sfântu Gheorghe with the retentive canals and the secondary branches of the Sulina Canal called the Old Danube.

The main function of AFDJ is the provision of shipping conditions on the Danube through dredging, hydrographic exploration, coastal and floating signaling, pilotage of the maritime Danube sector between Sulina and Braila and in the Danube seaports, special river and maritime transport on the Danube, and international relocation as well as the fulfillment of the obligations of the Romanian State under the international conventions and agreements to which Romania is a part entrusted to it by the Ministry of Transport, Response to HGR 492/2003.

The main tasks performed by the administration are the following:

- Ensuring the depth of navigation by dredging the maintenance;
- carrying out topohydrographic surveys for observation and observation of the morphological situation, loading of the Danube strata, especially at the critical points, flow and alluvium measurements and current speed measurements;
- designing or consulting the completion of repair and maintenance works for bank protection and special hydro-technical works in order to improve the shipping conditions;
- carrying out surveys, dredging and relocation of obstacles in port basins and operational sites on request by port administrations on a contractual basis;
- making coastal and floating signaling;
- direction of navigation of difficult segments through semaphores and observation stations;

---

<sup>34</sup> <http://www.afdj.ro/en>

- developing proposals for special shipping rules for the Danube River and for the maritime sector and submitting them for approval by the competent authorities;
- collection and processing of hydrometeorological data, preparation of forecasts for the level of the Danube River change in the Romanian sector;
- daily data for forwarding the hydrometeorological newsletter of the Danube River to Romania Actualitati radio station;
- editing and dissemination of the hydrometeorological newsletter for the Danube with hydrological data, meteorological data, minimum navigational depths, general gauges and other recommendations for difficult navigational sectors;
- preparing and distributing notifications to navigators;
- approval of construction works on waterways and work on crossing and crossing the Danube River;
- providing the necessary information to the Danube Commission for the preparation of the Danube's Large Work Plan;
- preparation of navigation maps for the Romanian Danube River sector;
- participation in the Danube Commission and other international bodies, markets and exhibitions;
- coordinating the activities of economic agents interested in the breakdown of ice on the Danube;
- providing services and hiring - on a contractual basis - to Romanian or foreign legal entities;
- marine pilotage in the Danube, from the Sulina bar - Braila sector in accordance with Articles 31, 32 and 33 of the Danube River Shipping Convention, a regime signed in Belgrade in 1948 as well as other legal regulations are in force;
- fulfillment of Romania's obligations under international conventions and agreements to which Romania is a party, in accordance with the law;
- performing editorial and printed activities;
- examine and authorise pilots annually and issue pilot licenses for the Danube;
- approval of studies and projects to be carried out in the riverbed and on waterway platforms;
- setting tariffs for all facilities and services included in the site of activity;

- overseeing the development of construction work carried out on the bed and on the waterways;
- approval of sites and execution of construction works for the extraction of ballast from the Danube and its tributaries;
- approval of the extraction activities of the Danube ballast and its arms;
- endorsement of the work done in the Danube bed and its subsidiary weapons for port investment and other purposes, as well as the areas for disposal of the material resulting from this activity;
- establishing and approving the waste disposal areas for materials resulting from the deep maintenance of long, anchor and docks;
- centralisation and systematisation of data related to maritime traffic, hydrological and meteorological data, etc., as well as those requested by the Danube Commission;
- maintenance and repair of all shores that are publicly owned and managed by the administration and all those administratively owned;
- ensuring the use of river infrastructure, state public property by third parties, through concession, lease or association contracts, in accordance with the provisions of the law;
- provision of telecommunications, radiotelephony, telex and data transmission services;
- the preparation of annual and future programmes for the main indexes of maintenance pass-topohydrographic studies, dredging, maintenance and repair of hydrotechnical constructions - as well as repair and modernisation of public goods state property and administration property of goods;
- contracting of loans from banks and other financial institutions in order to achieve the proposed objectives;
- conclusion of sales contracts with Romanian and foreign economic agents, equipment, installations, materials.

### **3. Navigation safety in the cross-border region Romania-Bulgaria**

#### **3.1. Navigation safety problems in the Romania-Bulgaria cross-border region and their overcoming through the joint efforts of the two countries**

In recent years, modern logistics, navigation and information systems have been developed for the Danube, which contributes to improving the conditions of shipping and reduces the risk of accidents.

The main problems with Danube navigation are unsatisfactory parameters of the shipping route, poor navigational conditions (fog, low water levels and other obstacles), non-compliance with the shipping restrictions imposed due to low water levels and other reasons. River navigation problems stem from erosion on shores and islands and intersection of certain stretches, leading to a decrease in depths.

Existing hydrological and climatic conditions along the country's only inland waterway - the Danube, require measures to improve navigational conditions and provide a minimum depth of 2.5 metres for the whole or most of the year necessary for sailing of ships up to 3 000 tonnes. Inland waterway transport is of great importance and has underdeveloped potential for countries along the Danube bank.

However, inland waterway navigation depends strongly on the morphological and climatic conditions of the river and the quality of the existing infrastructure. These conditions are mainly constrained by two factors: one of which is the so-called bottlenecks. These are areas with insufficient shipping conditions, e.g. due to hard rock formations in the river that lead to reduced water depth. The other factor is the weather conditions (and in the longer term the climate), which, depending on precipitation and evaporation, can lead to low river water levels in certain seasons. One of the main seasonal factors influencing shipping safety is the winter mode of shipping along the river. Winter regime means the nature of changes in water temperature during the winter period of the year and the occurrence of ice phenomena. The cause of the ice phenomenon is the temperature of the air. The water mass interacts with the atmosphere and the river bed, thus not carrying out mutual heat exchange.

In addition to these two natural factors, the laws regulating the maximum permissible number of barges as well as the built-in infrastructure constructions by individual countries also limit the number of vessels and the speed at which they can travel.

The aforementioned factors directly affect the traffic on the Danube, as the delays of the vessels are determined by the fact that the route in the Romanian-Bulgarian section along the river is closed in a large number of days of the year.

Navigation is carried out in accordance with various national and international legislative instruments, which, along with the available infrastructure and natural resources, guarantee the safety of shipping.

In order to increase the economic attractiveness of shipping, the following basic needs related to its safety can be defined:

- constantly maintaining the depth and breadth of the fairway in view of the continuity of the availability of sustainable and efficient sailing conditions
- keeping the radius of the curve
- construction and maintenance of the necessary port and concierge infrastructure
- low water regulation through hydraulic structures (e.g. breakwaters) and dredging
- building and maintaining an infrastructure that needs to be located taking into account relevant physical and other factors (e.g. proximity to the market and connectivity to the wider transport network)
- implementation of systematic preventive measures on the formation of ice water in the waterway.

The overall objective of the measures identified in this analysis is to provide the recommended parameters of the fairway and the navigation safety conditions across the Romania-Bulgaria cross-border area by optimising the maintenance activities of the waterways. This goal is permanent and all actions taken must be in line with it.

In order to ensure navigation safety and increase the attractiveness of shipping and the share of inland waterway transport on the transport services market, concerted action by both sides of Romania and Bulgaria is needed in two main directions:

- to eliminate/reduce the problems of shipping on the Danube and its canals and to improve their maintenance in order to increase the patentability and speed of movement;
- modernisation of cargo handling facilities under competitive conditions to other modes of transport.

The envisaged joint actions in the Action Plan to be developed in the framework of the Lower Danube Navigation Safety Strategy will contribute to enhancing navigational safety and the attractiveness of inland waterway transport by maintaining the depth and breadth of the fairway, regulation of low water improvement of the infrastructure, including the channels, and also by removing the critical sectors that affect the navigation on the Danube and the canals of the waterway. This will lead to an increase in the duration of the Danube's annual operation, a reduction in shipping and, implicitly, an increase in the credibility and competitiveness of this transport.

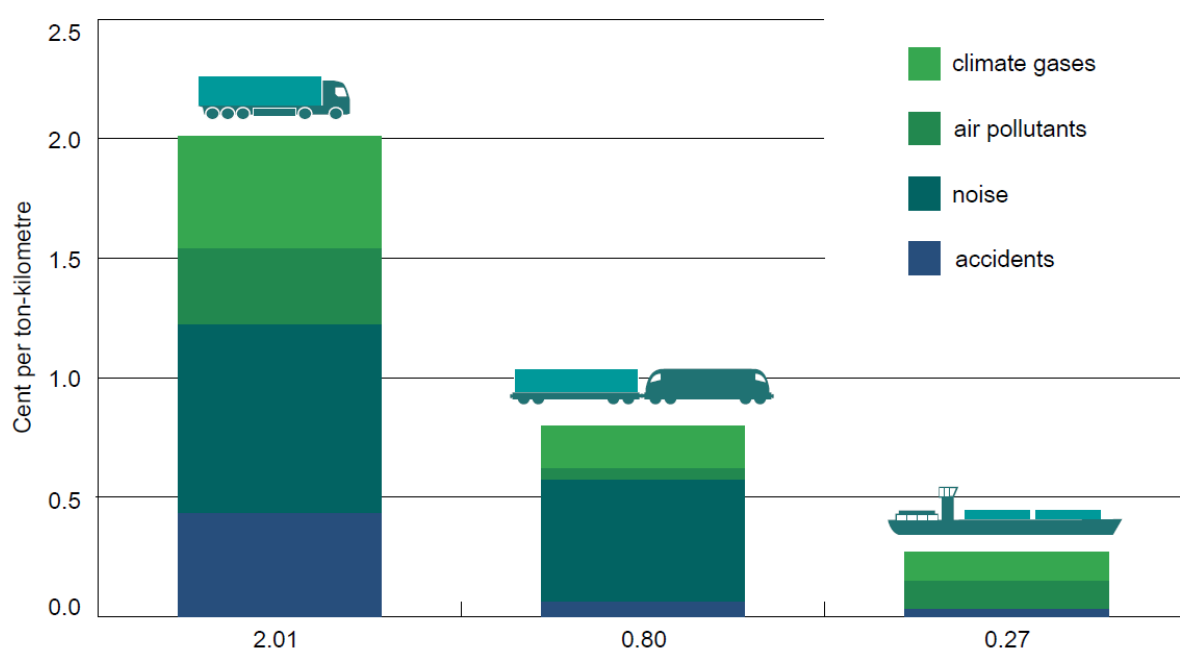
The joint efforts of Romania and Bulgaria to overcome the problems related to navigation safety and investments in improving shipping will be completed by modernising the existing infrastructure in the ports located in the central TEN-T, thus providing a combination of factors may increase the attractiveness of shipping and increase the volume of goods transported by water and the extent of use of waterways and ports.

### **3.2. River transport accidents in the cross-border region**

Compared to the other main types of freight transport - road and rail, river transport has the lowest external cost. According to 2007 data, these costs are 0.27 eurocents, at 0.80 eurocents for railways and 2.01 for road transport. Part of the external transport costs are due to the costs of accidents during transport. In river transport these costs also have a very low value. This is due to the extremely small number of transport accidents.



**Figure 7. Amount of external costs for different modes of transport**



Source: PLANCO, 2007.

According to Eurostat data in 2008-2017, the peak of accidents in Bulgarian river transport was in 2012 with 5 incidents. In the near to this year 2014 and 2010 there were 4 and 3 incidents respectively. With the exception of 2015 when one incident occurred during the remaining period of observation in the river transport of the country, no accident or no information has been reported.

While this country is the best performing among the countries listed below, Romania is at the opposite pole. In the period 2008-2016 there were an average of 53 accidents per year. This level is very high compared to the other accident recorders Austria and Hungary with respectively 19 and 13 incidents average annual.

**Table 9. Number of inland waterway accidents in EU countries during 2008-2017**

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Bulgaria	:	:	3	0	5	4	0	1	:	:
Czech Republic	10	11	7	9	3	7	6	12	20	11
Croatia	2	0	3	1	2	2	1	2	3	:
Hungary	2	8	38	13	21	4	5	6	20	:
Austria	:	18	19	14	12	25	19	28	17	:
Poland	:	8	9	5	5	12	10	8	4	6
Romania	30	51	32	34	80	81	41	75	53	56
Slovakia	:	:	16	9	5	9	:	:	:	:

: - lack of data.

Source: Eurostat, 2018, Institutul Național de Statistică Transportul portuar maritim de mărfuri și pasageri 2017, 2018.

The seriousness with the problem of accidents in Romania becomes even more significant if dangerous goods incidents are taken into account. For the same period in Romania, they are the most compared to the same countries in the above table - 7. In Bulgaria there was only one such case in 2013.

The conclusion that can be drawn from the short analysis of river transport accidents is that they are concentrated in the Romanian country. Although a small part of them is related to the transport of dangerous goods, which could lead to serious damage in the cross-border area. It is therefore necessary to make more serious and in-depth studies on the causes and scale of this phenomenon.

### **3.3. Navigation risk assessment**

The assessment of risk factors for navigation is a rare practice in the institutions involved in shipping. According to a Polish publication, this is only done in Denmark and Finland from all countries bordering the Baltic Sea.<sup>35</sup>

In the publication of the Danube commission “Basics of Danube Navigation” there are outlined practical rules for avoiding shipping risks, but without providing a comprehensive system of risk analysis and assessment.<sup>36</sup>

Navigation should be understood as a system of highly interconnected elements. These elements include the Danube waterway, vessels and their cargoes, ports such as hubs connecting river navigation with road and rail transport, the river information system along with the political and legal framework.<sup>37</sup> The potential of navigation on the Danube can only be fully realised when the interaction of all these elements takes place.

---

<sup>35</sup> Gucma, L. Navigational safety management, 2011, Maritime University of Szczecin.

<sup>36</sup> Commission du Danube, Dispositions fondamentales relatives a la navigation sur le Danube, 2010.

<sup>37</sup> via donau, Manual on Danube Navigation, 2013.

The navigational safety of navigation can be defined as a complex feature of shipbuilding which determines the ability of ships to move without threat (in the navigational sense) to the life of humans and the integrity of ships and vessels.

Navigational hazards are subdivided into four groups:

- Dangers coming from the bottom (shallows, reefs, stones, sewers, depths, pits, shallow waters) and wrecks;
- hazards caused by hydrometeorological factors (wind, fog, icy, currents, etc.);
- floating objects (mines, barrels, buoys, fishing nets, etc.);
- hazards in the form of restrictive lines on maps (polygon boundaries, prohibited navigation areas, traffic separation systems, etc.) and demarcation lines.

In its resolutions, the International Maritime Organisation has drawn up the following safety requirements, which can also be adapted to river transport:

- a) establishing uniform requirements for the design, equipment, the supply of vessels and their fitting with qualified crews;
- b) organising the watch service;
- c) timely notification of marine hazards;
- d) development of recommended routes through oceans and seas;
- e) creating systems for separating the movement of ships in narrow and intense shipping areas;
- f) developing a system for unified identification of navigational hazards;
- g) organising piloting and icebreaking;
- h) developing and applying rules on maneuvering and signaling when ships are diverted;
- i) mandatory investigation of marine casualties, identification of causes and development of recommendations for their prevention.

According to the categorisation of the inland waterways of Europe, the Bulgarian section of the Danube falls in class VII. The technical parameters of the water sections falling under categories VI and VII should provide safe navigational conditions for the movement of ships carrying oversized, heavy and bulky goods as well as containers stacked on three and four levels.

The conditions of navigation on Danube inland waterways also influence the seasonal fluctuations at river level (high water, low water and ice formation) and the presence of narrow places along the waterway. Controlling these phenomena in many cases is impossible and has a negative impact on shipping. At certain times of the year the level of the Danube fluctuates to a varying extent in the individual sections due to the specific features of the climatic and geological conditions.

**Chart 3. Vessel draft restrictions in the Bulgarian section of the Danube River**



Between 12% and 18% of the days of the year, the Danube River Basin is inappropriate for safe navigation during a ten-year period.

Ice-water formation is another risk factor. Nearly a month in 2017, the flow of the river was stopped when the ice in places reached 70-80%. The occurrence of such force majeure is accompanied by an increase in the variable costs of river operators and a decrease in consumer demand due to an increase in the cost of transport services.

Another weakness of the Bulgarian section of the Danube River is the presence of narrow places. These waterways of international importance belonging to the European inland waterway network and whose parameters do not meet those approved for classification in the relevant category are defined as bottlenecks. The presence of narrow sites along the Danube is a sign of the unsatisfactory quality of waterways and difficult shipping. The total length of these stretches is 91 km, which represents approximately 19.4% of the length of the Bulgarian waterways. They fall into the category of narrow places of strategic importance and are located near “Port Complex – Ruse” EAD.

The insufficient funds and the lack of suitable dredging equipment accompany the maintenance of the waterway in Bulgaria. As noted in Viadonau's Annual Report for 2016:

“Although good hydrological conditions throughout the year, the conditions of the fairway were less favorable in the second half of 2016. This was due to inadequate maintenance and the necessary capital intervention. In Hungary and Bulgaria in 2016 maintenance was not done due to lack of funds and the availability of suitable dredging equipment”.<sup>38</sup>

Maintaining project depths in ports is of particular importance for their commercial exploitation, but it is also a foundation for transport safety - avoiding emergency cases such as “touching the bottom of the ship” or even worse “jamming”. Incidents of this kind can lead to serious consequences for both the ship itself and the port and the state as a whole. In addition to the risks of damage to the hull and possible environmental damage from pollution, account should also be taken of the reputation of Bulgarian ports as safe. Damage to damaged reputation is indirect, but can be far beyond the damage of a particular emergency. Some of these damages will be measured by higher insurances for visiting ships, respectively higher freight rates and overall loss of competitiveness and reduced port turnover.

The inadequate depth of the fairway limits the rational utilisation of vessel capacity and therefore it is possible to transport only certain types of cargo, and this is directly related to the loss of inland waterway market positions and the reduction of consumer demand.

The navigation channel in the Bulgarian-Romanian section of the Danube does not meet the internationally accepted project standards issued by the Danube Commission. There are restrictions on navigational safety and accessibility of canals that limit the operational efficiency of the river fleet, the capacity of the river and the attractiveness of this transport.

---

<sup>38</sup> viadonau, Annual Report on Danube Navigation in Austria 2016.

**Diagram 9. Strategic and main bottlenecks along the Danube River**



Note:<sup>39</sup>

“Main bottlenecks” are sections of European waterways whose parameters are not in line with the requirements applicable to inland waterways of international importance in line with the new classification of European inland waterways (Class IV).

“Strategic bottlenecks” are other sections which meet the essential requirements of Class IV, but need to be modernised to improve the structure of the network or to increase the economic capacity of inland waterway traffic.

Source: via donau.

According to the report of the UN Economic Commission for the Blue Book, the strategic bottlenecks in the Danube River (E 80) range from 845.5 to 375.0 km, characterised by a low depth of the fairway during dry seasons (less than 2.50 m - a value recommended by The Danube Commission) of several critical sections, i.e.:

- from 845.5 to 610.0 km, with a fairway depth limited to 2.10-2.20 m 10-15 days a year, and
- from 610.0 to 375.0 km, with a fairway depth limited to 1.80-2.00 m for 20-40 days a year.<sup>40</sup>

<sup>39</sup> According to the definitions in: UNECE, "BLUE BOOK", 2012.

There are also issues related to erosion of shores and islands and intertwining of certain stretches of the river, which leads to a decrease in depths. The problem of preserving the cleanliness of the Danube River in the Bulgarian area is a matter of utmost importance. Both the water and the bottom are contaminated with sludge and deposits in many places. In the case of small depths of tallweg, especially in periods of low water, conditions are created that can cause ship storms and incidents. This could result in the discharge of waste water and water contaminated by oil and/or marine fuel that would cause pollution of the river. Improving the depth in critical sections will reduce the likelihood of incidents of this nature. In these circumstances, it is necessary to take measures to improve the parameters of the shipping route and the coastal and islands accompanying this objective.

A serious problem is also the state of the existing port infrastructure - morally and physically outdated, use of equipment not in the foreground, etc. (see point *1.3 State of the port infrastructure in the cross-border region*).

A serious safety issue is non-compliance with the shipping restrictions imposed due to low water levels or other reasons. A major influence on improving the safety and security of the transport process is the responsibility of each transport infrastructure operator to strictly comply with the requirements of compliance with technical regulations and standards for its use. Negative impact on the safety and security of traffic violates operating rules in accordance with technical standards and standards.

After the brief summary of the risk factors, a systematisation of the extracted elements of the navigation is made. At the same time, the main problems and manifestations of these elements, understood as risk factors, are presented.

---

<sup>40</sup> Ibidem.

**Table 10. Risk factors of navigation in the cross-border region**

<b>Risk factors</b>	<b>Problems and manifestations</b>
Ensuring a safe waterway	<ul style="list-style-type: none"><li>• Seasonal fluctuations at the level of the waterway</li><li>• Ice formation</li><li>• Obsolete and inefficient drainage equipment</li><li>• Insufficient financing of maintenance activities</li><li>• Coastal erosion and islands and entanglement</li><li>• Availability of bottlenecks</li></ul>
Vessels and cargoes	<ul style="list-style-type: none"><li>• Compliance with shipping restrictions and operating rules</li><li>• Management of loading and unloading activities</li></ul>
Port infrastructure	<ul style="list-style-type: none"><li>• Old quay mechanisation</li><li>• Lack of intermodal connectivity</li></ul>
RIS	<ul style="list-style-type: none"><li>• Need to complete the system</li><li>• Traffic monitoring and management</li></ul>

Source: made by the authors.

Most problems exist in maintaining the waterway. There is a need to concentrate efforts on planning measures to increase navigational safety. In most cases, the problems are related to investments, and only in compliance with the restrictions and the RIS should be taken “soft” measures that address the subjective factor.

The next step in the risk analysis has been to assess the likelihood and impact of individual groups of risk for navigation. This methodology has been applied to the methodology proposed in the technical proposal. Three-tier scale is used to assess probability and impact. The highest value of 3 pts is placed with the highest probability and impact. Conversely, 1 point is placed on factors with the lowest probability and degree of impact.



Diagram 10. Risk assessment matrix

**Risk significance = probability \* impact**

			<b>Impact</b>		
			High	Moderate	Low
<b>Probability</b>	0.65-1.0	High	<b>ALERT</b>	very high	high
	0.3-0.64	Moderate	very high	high	moderate
	0.0-0.29	Low	high	moderate	OK

The results of this assessment are presented in the following table. The highest risk exists in providing the waterway and port infrastructure. Priority should be given to efforts to improve navigation on the Danube River.

With lower priority are the factors related to vessels and RIS. Measures should focus on reducing the impact of risk factors while preserving the low probability of occurrence of the event.

Table 11. Results of navigation risk assessment

Risk factors	Probability	Impact	Overall assessment
Ensuring a safe waterway	2	2	4
Vessels and cargoes	1	2	2
Port infrastructure	2	2	4
RIS	1	2	2

The number of accidents occurring in freight and passenger transport is an indicator that characterises navigation safety. In the analysis of the accidents in the last years in the cross-border region, it was found that while in Bulgaria they are very rare, in the neighbouring Romania such incidents occur very often. Therefore, there is a need to seriously analyse the causes of these accidents and to identify measures to reduce the risk of accidents.

As a systemic weakness, it can be noted that no systematic risk analysis is performed and there are no observed measures to overcome or mitigate the risk factors.

#### **4. SWOT analysis of waterway transport infrastructure in the cross-border region**

The analysis of strengths and weaknesses, opportunities and threats (SWOT analysis) summarises the analysis. It includes the most important features of river transport infrastructure in the cross-border region as well as the peculiarities of the external environment that are expressed as opportunities and threats.

The strengths of the site analysed relate to the benefits of inland waterway transport and navigation to other modes of transport in terms of economy, environment and transport, the functioning information system and institutions, and the safety of river transport.

Weaknesses stem from the worn out water transport infrastructure, the problems that come from maintaining waterway parameters and low connectivity with other transport networks.

The options presented refer to the unused capacity of port handling facilities, the construction of intermodal terminals and the availability of programs and tools to finance the modernisation and construction of new infrastructure and the improvement of its management.

The threats to the development of river transport infrastructure come from disregarding the development of this mode of transport in relation to other modes of transport and, above all, the road, resulting in low public investment, connectivity and maintenance of existing infrastructure.

**Table 12. Strengths, weaknesses, opportunities and threats analysis**

Strengths	Weaknesses
<ul style="list-style-type: none"> <li>• low direct and external costs</li> <li>• ability to transfer large amounts of cargo once</li> <li>• the lowest degree of environmental pollution</li> <li>• high degree of safety of river transport</li> <li>• 24-hour freight and passenger transport</li> <li>• low costs for building and maintaining the main and the accompanying infrastructure</li> <li>• an information system for shipping traffic management</li> <li>• functioning institutions responsible for navigating and maintaining the waterway</li> </ul>	<ul style="list-style-type: none"> <li>• high dependence on the changing weather conditions of the fairway, blocking of transport activity and uncertainty over delivery times</li> <li>• low operating speed</li> <li>• low network connectivity with other transport networks</li> <li>• high degree of physical and moral degradation of river transport infrastructure</li> <li>• old and low-productive facilities to maintain the fairway</li> <li>• lack of a network of intermodal terminals in the cross-border region</li> </ul>
Opportunities	Threats
<ul style="list-style-type: none"> <li>• unused capacity of the waterway and the built port infrastructure</li> <li>• increasing public awareness of the use of environmentally friendly transport</li> <li>• improving cooperation for the development of intermodal supplies</li> <li>• a favourable policy framework</li> <li>• international programmes and funding for the development of river transport and relevant infrastructure</li> <li>• construction of intermodal terminals</li> <li>• use of public-private partnerships to develop and modernise river transport infrastructure</li> <li>• the establishment of the “silk road”</li> </ul>	<ul style="list-style-type: none"> <li>• low priority for river transport development in national strategy papers</li> <li>• insufficient costs of modernising river transport infrastructure</li> <li>• insufficient costs of maintaining the waterway</li> <li>• the construction of new bridges in the cross-border region</li> </ul>

The main conclusion of the analysis is that with the help of well-balanced public and private investments and projects in the infrastructure and the connectivity of river transport with road and railways. the network can achieve significant economic results with positive social and environmental dimensions.

## **5. Vision, missions and strategic goals, investment priorities and operational objectives**

The system of a strategic framework consists of vision, mission, investment priorities and operational objectives. It was developed taking into account the results of the analysis and the SWOT analysis. The strategic framework is aimed at strengthening strengths, reducing weaknesses and exploiting opportunities for development, taking into account the resulting threats.

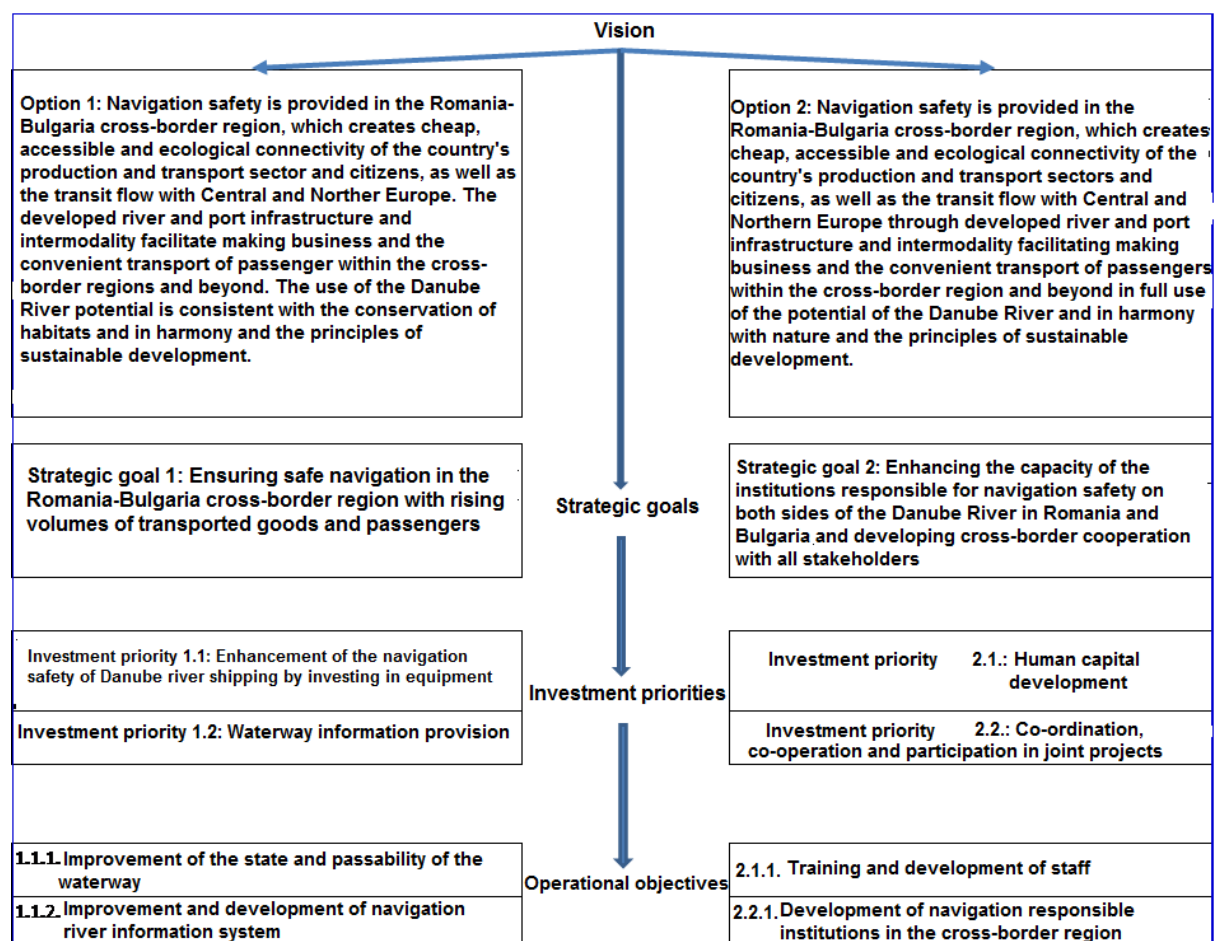
Apart from the results of the analytical part, the development of the strategic framework is in line with the targeting hierarchy and the logic of intervention. Other strategic documents that were created in other similar projects or were the result of arrangements reached at partner meetings between the responsible authorities were also considered. Thus, continuity and consistency between the individual planning documents was created.

In accordance with the order's order, two variants of the vision are presented, one of which should be chosen by the Contracting Authority. Both are compatible with the proposed target framework so that no change is required for one or other vision choices.

Two strategic goals have been drawn up. The first one focuses on the navigation safety infrastructure and the second on the institutions responsible for Lower Danube navigation.

Accordingly, two strategic priorities are identified for achieving each strategic goal. Each of these priorities is specified for operational purposes.

Diagram 11. Strategic framework



In addition to the strategic formulations, a mission has been developed, which is presented in the bottom box.

Mission
<p>The responsible navigational safety authorities in the Romania-Bulgaria cross-border region jointly plan, implement, observe, exchange information and provide conditions for safe navigation in the Lower Danube under agreed international agreements using state-of-the-art equipment and apply appropriate technologies to provide the necessary for safe navigation parameters of the waterway, have highly qualified staff and sufficient financial resources to implement the strategic and operational their plans and their participation in international networks allows the continuous development of their capacity, the exchange of useful information and the application of frontier experience and practices.</p>

## **6. Action Plan**

### **6.1. Activities and expected results**

For implementation of the strategic framework, an action plan has been developed, which consists of selected activities to achieve the objectives, responsible institutions, deadlines, financial resources for each activity. In addition, the expected results and performance indicators, outcomes and impacts are added to the action plan summary table (see Annex 1). The Action Plan was developed in a time horizon of 2019-2025 including.

Activities can essentially be divided into investment and “soft”, with investment being geared towards improving the navigation infrastructure and the institutions responsible for it, while “soft” measures are related to the development of human capital using this material base. Some activities envisage combining these two types of activities with a view to achieving a complex impact of the intervention measure.

Activities are presented in a summarised manner so that they can be specified when awarding contracts for their implementation. In this way, those who implement the Action Plan can have flexibility and take into account the current market situation.

Another feature of the activities is that they have been developed for joint implementation between the Bulgarian and the Romanian side. In preparing their implementation between the two countries, it is necessary to discuss and define the concrete content of the measures to be implemented by each country.

The expected results are related to the activities envisaged for implementation. These activities receive a material dimension.

The activities foreseen in the plan, arranged according to the strategic framework, together with the institutions responsible for implementing them and the deadlines for implementation, as well as the expected results are presented in the following table.

**Table 13. Activities and expected results of the Action Plan**

Strategic goals and operational objectives, investment priorities/activities	Responsible institution and partners	Deadline	Expected results
<b>Strategic goal 1 : Ensuring safe navigation in the Romania-Bulgaria cross-border region with rising volumes of transported goods and passengers</b>			
<b>Investment priority 1.1: Enhancement of the navigational safety of Danube river shipping by investing in equipment</b>			
<b>Operational objective 1.1.1. Improvement of the state and passability of the waterway</b>			
1.1.1.1. Monitoring of the waterway - investments in vessels for monitoring the parameters of the waterway (echolocation and other), automatic measuring stations, signs and training of the staff to work with them	EAEMD/CN APDF SA Giurgiu/CN APDM SA Galați	2019 - December 2022	Number of new ships for waterway monitoring Purchased and installed new automatic measuring stations Staff, trained to work with the new equipment
1.1.1.2. Investments in supporting facilities (multi-purpose dredgers, barges, pontoons, maneuvering ships, pipes, navigation signs, shore lights, etc.) - providing financing, purchasing and using	EAEMD/CN APDF SA Giurgiu/CN APDM SA Galați	2019 - December 2022	Purchased new dredging vessels Purchased new barges Purchased new pontoons, pipes, etc. Purchased and installed new navigation signs
<b>Investment priority 1.2: Waterway information provision</b>			
<b>Operational objective 1.2.1. Improvement and development of navigation river information system</b>			
1.2.1.1. Completing the development and deployment of RIS base modules	SEPI/Romanian Naval Authority	2019 - December 2020	Developed and implemented all RIS base modules in both countries
1.2.1.2. Planning and development of new RIS modules	SEPI/Romanian Naval Authority	2021 - December 2024	Developed new functional RIS modules
1.2.1.3. Full integration and permanent exchange of data with other RISs that provide information on shipping across the Danube	SEPI/Romanian Naval Authority	2019 - December 2025	Fully integrated data bases
1.2.1.4. Continuous development and provision of convenient user interface to RIS	SEPI/Romanian Naval Authority	2019 - December 2025	User friendly RIS interface
<b>Strategic goal 2: Enhancing the capacity of the institutions responsible for navigation safety on both sides of the Danube River in Romania and Bulgaria and developing cross-border cooperation with all stakeholders</b>			
<b>Investment priority 2.1: Human capital development</b>			
<b>Operational objective 2.1.1. Staff training and development</b>			
2.1.1.1. Providing ongoing training, improvement and staff development	EAEMD/CN APDF SA Giurgiu/CN APDM SA Galați	2019 - December 2025	Conducted staff trainings for developing new skills and acquiring new knowledge
2.1.1.2. Developing capabilities for analysis and management of navigation risk	EAEMD/CN APDF SA Giurgiu/CN APDM SA Galați	2019 - December 2020	Created and used navigation risk management system
<b>Investment priority 2.2: Co-ordination, co-operation and participation in joint projects</b>			
<b>Operational objective 2.2.1. Development of the authorities responsible for navigation in the cross-border region</b>			
2.2.1.1. Investments in the material base for ensuring the operational activity	EAEMD/CN APDF SA Giurgiu/CN APDM SA Galați	2019 - December 2023	Number and type of purchased equipment Number of implemented projects Amount of invested funds
2.2.1.2. Encouraging co-operation and participation in professional networks	EAEMD/CN APDF SA Giurgiu/CN APDM SA Galați/SEPI/Romanian Naval Authority	2019 - December 2025	Integration of Bulgarian and Romanian institutions in European networks
2.2.1.3. Improving the capacity for participation and implementation of international and national projects	Ruse Municipality/Giurgiu Municipality/EAEMD/CN APDF SA Giurgiu/CN APDM SA Galați/SEPI/Romanian Naval Authority	2019 - December 2021	Available capacity for preparation of successful project proposals and project management
2.2.1.4. Improving the coordination, collection and exchange of information with ports and river port operators	EAEMD/CN APDF SA Giurgiu/CN APDM SA	2019 - December 2025	Improved coordination and communication with ports and port operators



## 6.2. Indicative financial framework

The financial resources needed to implement the action plan are summarised by activity. This is done with the idea of greater flexibility in the allocation of funds by individual items and projects of the output activities. Moreover, when budgeting the performance of each activity can be taken into account the current prices and according to the technical specifications and requirements for the supplies and services to draw a specific estimate for each order.

The pledged amounts are in line with the scale of the funds provided in other similar documents such as Fairway Rehabilitation and Maintenance Master Plan for the Danube and its Navigable Tributaries: National Action Plans. Update October 2017.

The total indicative value for the implementation of the activities in the Bulgarian and Romanian parts is EUR 40.95 million. Most resources are earmarked for operational purposes 1.1.1.

The indicative financial framework is presented in the following table.

**Table 14. Indicative financial framework of the Action Plan**

Strategic goals and operational objectives, investment priorities/activities	Financial resources, million euro
<b>Strategic goal 1 : Ensuring safe navigation in the Romania-Bulgaria cross-border region with rising volumes of transported goods and passengers</b>	
<b>Investment priority 1.1: Enhancement of the navigational safety of Danube river shipping by investing in equipment</b>	
<b><i>Operational objective 1.1.1. Improvement of the state and passability of the waterway</i></b>	
1.1.1.1. Monitoring of the waterway - investments in vessels for monitoring the parameters of the waterway (echolocation and other), automatic measuring stations, signs and training of the staff to work with them, out of which:	<b>18</b>
investment costs	12
operational costs	6

Strategic goals and operational objectives, investment priorities/activities	Financial resources, million euro
1.1.1.2. Investments in supporting facilities (multi-purpose dredgers, barges, pontoons, manoeuvring ships, pipes, navigation signs, shore lights, etc.) - providing financing, purchasing and using, out of which:	<b>20</b>
investment costs	12
operational costs	8
<b>Investment priority 1.2: Waterway information provision</b>	
<b><i>Operational objective 1.2.1. Improvement and development of navigation river information system</i></b>	
1.2.1.1. Completing the development and deployment of RIS base modules, out of which:	<b>1</b>
investment costs	1
operational costs	
1.2.1.2. Planning and development of new RIS modules	<b>1,5</b>
investment costs	1,5
operational costs	
1.2.1.3. Full integration and permanent exchange of data with other RISs that provide information on shipping across the Danube, out of which:	<b>0,5</b>
investment costs	0,5
operational costs	
1.2.1.4. Continuous development and provision of convenient user interface to RIS, out of which:	<b>1</b>
investment costs	1
operational costs	
<b>Strategic goal 2: Enhancing the capacity of the institutions responsible for navigation safety on both sides of the Danube River in Romania and Bulgaria and developing cross-border cooperation with all stakeholders</b>	
<b>Investment priority 2.1: Human capital development</b>	
<b><i>Operational objective 2.1.1. Staff training and development</i></b>	
2.1.1.1. Providing ongoing training, improvement and staff development, out of which:	<b>0.35</b>
investment costs	
operational costs	0.35
2.1.1.2. Developing capabilities for analysis and management of navigation risk, out of which:	<b>0.2</b>
investment costs	
operational costs	0.2

Strategic goals and operational objectives, investment priorities/activities	Financial resources, million euro
<b>Investment priority 2.2: Co-ordination, co-operation and participation in joint projects</b>	
<b><i>Operational objective 2.2.1. Development of the authorities responsible for navigation in the cross-border region</i></b>	
2.2.1.1. Investments in the material base for ensuring the operational activity, out of which:	<b>0,5</b>
investment costs	0,5
operational costs	
2.2.1.2. Encouraging co-operation and participation in professional networks, out of which:	<b>0.1</b>
investment costs	
operational costs	0.1
2.2.1.3. Improving the capacity for participation and implementation of international and national projects, out of which:	<b>0.1</b>
investment costs	
operational costs	0.1
2.2.1.4. Improving the coordination, collection and exchange of information with ports and river port operators, out of which:	<b>0.2</b>
investment costs	
operational costs	0.2
<b>Total</b>	<b>40.95</b>

### 6.3. Risk management measures

The tools and skills needed to manage the risks and to obtain reasonable assurance that the objectives of the Strategy will be achieved should be selected according to the types of risks and optimal spending of the institutions responsible for the implementation (including time).

In order to achieve quality risk management in the implementation of the Strategy, the following definitions should be given:

- **Risk** is any uncertain event that may prevent the Strategy from achieving its goals in an effective and efficient manner. It depends on the ratio between probability and magnitude of damage from the occurrence of an event associated with the implementation of the strategic document.

- **Risk management** is a continuous process that is an integral part of the control over the implementation of the Strategy.

### **Risks endangering the implementation of the Strategy**

Risk 1: Poor communication and coordination (co-ordination) between the Romanian and Bulgarian institutions responsible for the Lower Danube navigation safety.

Risk 2: Immediate reporting of changes in supranational regulations related to inland waterways along the Danube River and changes in the regulatory framework of Romania and Bulgaria that are relevant to the activities carried out and the expected results from the implementation of the Strategy.

Risk 3: Political changes and actions at national and supranational level impeding the implementation of the Joint Strategy.

Risk 4: Reducing funding due to a contraction in the budgets of funding institutions.

To mitigate or overcome the impacts of the resulting risks, comprehensive measures have been developed, which are presented in the following statement.

#### **Risk 1: Measure “Good organisation of the coordination process and established mechanisms for regular communication between the responsible institutions”**

The Strategy and Action Plan outline the problems, offer solutions and coordinate the efforts of the responsible institutions to improve the navigation in the cross-border region.

A Joint Co-ordination Unit (JCC), composed of representatives of the individual responsible institutions of both countries, will be organised, and the same may be rotated. This will allow to reduce the risks associated with the large number of contacts between different representatives of the responsible institutions during the implementation of the Strategy. Within the framework of the work of the JCC, the levels of communication and communication channels to be used by the responsible institutions from the cross-border region in the process of implementing the Strategy.

#### **Risk 2: Measure “Monitoring the applicable strategic documents, supranational regulations and regulatory framework of both countries (Romania and Bulgaria) concerning the Danube Delta navigation safety”**

The Coordination Unit will organise regular monitoring of prepared and/or accepted changes to strategic documents, supranational regulations and national regulations. This will be done through a regular review of publicly-announced drafts of changes to the responsible institutions at EU and national level in Romania and Bulgaria. Monitoring will be carried out as well as changes to regulations and regulations published on the official websites of the responsible institutions. In addition, the JCC will also monitor changes in regional and municipal documents that are relevant to the activities carried out and the expected results of the implementation of the Strategy.

In the event of a change in the applicable regulations and/or regulatory document, through the designated responsible institutions/Authorised Experts, will carry out an expert evaluation as to whether the changes have an impact on any activity or expected outcome of the implementation of the Strategy. The evaluation will be done through the two alternatives – “IMPACT” and “NO IMPACT”. The necessary actions will be taken in case of “IMPACT” assessment so that the changes are taken into account in full compliance with the regulatory requirements. In case of “NO IMPACT” assessment, no action is taken on implementation, but only updating of the database of regulations and normative documents of the individual responsible institutions that concern the implementation of the Strategy.

For the purpose of monitoring the applicable legal framework, the JCC will produce the most comprehensive list of normative documents that can influence the implementation of the Strategy.

The process of creating new strategic documents in the next EU programming period 2021-2027, which will replace the documents in force until 2020, will be followed up.

Object of monitoring will be the following set of documents (non-exhaustive list):

- Convention on the Navigation of the Danube River (the Belgrade Convention of 1948),
- Agreement between the Government of the People's Republic of Bulgaria and the Government of the Romanian People's Republic on the maintenance and improvement of the fairway in the Bulgarian-Romanian section of the Danube from 1955
- Law on Maritime Spaces, Inland Waterways and Ports of the Republic of Bulgaria.

- EU Strategy for the Danube Region
- INTERREG V-A Romania - Bulgaria /joint programming document/
- The European Agreement on Main Inland Waterways of International Importance
- Bilateral Agreement between the Governments of Romania and the People's Republic of Bulgaria, Sofia, 1955
- National Development Program: Bulgaria 2020
- Decision of the Council of Ministers No 192 of 25 March 2015 on the functioning of the National Coordination Mechanism for the implementation of the Strategy of the European Union for the Danube Region
- Danube River Basin Management Plan for the period 2016 - 2021
- River Basin Management Plan in the Danube Region 2016-2021. /adopted by Decision No 1110 /29.12.2016 of the Council of Ministers/
- Navigation data published in the River Information System in the Bulgarian part of the Danube /BULRIS/
- Data on the ports in the Bulgarian-Romanian section of the Danube river, published in the River Information System in the Bulgarian part of the Danube / BULRIS / and the State Enterprise Port Infrastructure
- National Reform Program 2017 (Romania)
- National Strategic Plan for Optimisation and Maintenance of Water in Romania 2011-2020
- National transport development strategy (Romania)
- Romania's National Sustainable Development Strategy 2013 - 2020 -2030
- Integrated Strategy for Sustainable Development of the Danube Delta - No 602/2016 (Romania)
- National Management Plan of the Romanian part of the Danube International Basin - No 859/2016 on 16 December 2016 (Romania)
- Data on Romanian Port Infrastructure Infrastructure from Lower Danube River Administration (Romania)
- Regional Development Plan for the North-West Region 2014-2020, adopted by Council of Ministers Decision No. 459/01.08.2013 (Bulgaria)

- Regional Development Plan for the North Central Region 2014-2020, adopted by Council of Ministers Decision No 461/01.08.2013 (Bulgaria)
- Regional Development Plan for the Northeast Region 2014-2020, adopted by Council of Ministers Decision No. 460/01.08.2013 (Bulgaria)
- Southeast Region Development Plan 2014-2020 (Romania)
- South Region Development Plan 2014-2020 (Romania)
- Southwest Region Development Plan 2014-2020 (Romania)

### **Risk 3: Measure “Developing a stakeholder strategy”**

The strategy was developed through the participation of key stakeholders from both sides of the cross-border region. In this way, their interests have been taken into account and their capacity utilised in implementing the Action Plan.

When situations arise when certain countries start to exercise a reluctant influence on the implementation of the Strategy, a strategy to reduce or neutralise this impact should be developed. In the first stage of this strategy, the force field analysis tool can be used. It will then be necessary to generate and choose measures to change the overall balance of forces in the direction of increasing the supporting forces.

### **Risk 4: Measure “Alternative funding sources”**

In the event of a reduction in funding situation, action should be taken in two directions. First of all, the action plan should be re-examined and new measures prioritised. At this stage, it is necessary to review the budget of each measure and, if possible, to select measures that lead to similar results, but with less financial means. If necessary, the implementation of some measures may be left for later implementation.

Second, the financial program should be reviewed for opportunities to attract alternative funding - through financial instruments, public-private partnerships, use of other public sources and loans.

In this way, the action plan can be updated to match the new external conditions.

#### **6.4. Measures to include the responsible authorities**

Successful implementation of the Joint Strategy to Improve Navigation Safety in the Lower Danube for the period 2019-2025 includes activities that involve interinstitutional cooperation between different institutions at local, regional, national level in each of the two neighbouring countries, Romania and Bulgaria. These institutions have their specific place and role in the integrated implementation of the strategy document.

In this respect, the coordination of the implementation of the Lower Danube Navigation Safety Strategy should be coordinated by a special joint inter-institutional body with the participation of representatives of the cross-border region.

Good partnership relations between the institutions on both sides of the border established by the Agreement between the Government of the People's Republic of Bulgaria and the Government of the Romanian People's Republic on the maintenance and improvement of the fairway in the Bulgarian-Romanian section of the Danube from 1955, the EU Strategy for the Danube region, as well as realised projects funded by EU funds will contribute significantly to the realisation of this coordination.

The involvement of the responsible authorities in the implementation of the Lower Danube Navigation Safety Strategy can be implemented by applying the following measures:

Measure 1: Creation of a single coordination mechanism for the management of the implementation of the Strategy, through:

- Establishment of a Joint Coordination Unit (JCC) with representatives of the responsible institutions implementing the Strategy from both countries;
- defining the mission, structure and basic functions of the SAC
- determination of the technology of work, incl. holding joint meetings;
- appointment of National Coordinators from Romania and Bulgaria

Time horizon: November 2018.

Measure 2: Institutionalisation of the participation of authorised representatives of the responsible institutions in the Joint Coordination Unit and the activities related to the implementation of the Strategy.



Time horizon: November 2018.

Measure 3: Implementation of monitoring and evaluation of the commitments of the responsible institutions to implement the Strategy and the results achieved.

Time horizon:

Performance monitoring - once a year until the end of 2025

Evaluation of results - annually - for the immediate results; follow - up - May 2026.

### **6.5. Measures for optimisation of waterways in the cross-border area**

The optimisation of the waterways to increase the economic attractiveness of the transport of goods and passengers on the Lower Danube can be achieved through the implementation of the following measures:

Measure 1: Constantly maintaining the depth and width of the fairway and adjusting the low water by hydraulic structures and dredging to ensure continuity and sustainable conditions for sailing along the Lower Danube.

Measure 2: Constant monitoring of bottlenecks and maintenance of Radius of Curve.

Measure 3: Implementation of monitoring and implementation of systematic preventive actions on the formation of ice water in the waterway.

Measure 4: Planning, upgrading and maintenance of the necessary port and accompanying infrastructure.

Measure 5: Training staff to work with new technologies.

Measure 6: Development and implementation of joint projects to finance the modernisation of the waterway maintenance activities implemented in the cross-border area.

### **6.6. Performance monitoring and evaluation mechanism**

An important step in the implementation of the Strategy for Improving Navigational Safety in the Lower Danube is to perform periodic monitoring and evaluation of the progress

achieved in the implementation of the set objectives and to take corrective and preventive measures if necessary.

Responsible for this are the state public institutions on both sides that have to perform effective monitoring and ensure publicity and transparency of the results achieved in the implementation of the strategic document.

Responsible authorities are involved in monitoring, control and evaluation in all phases of preparation, implementation, storage, and dissemination of the activities and results of the implementation of the Strategy.

The activities for monitoring and evaluation of the Strategy for the period 2019-2025 are among the responsibilities of the proposed Joint Coordination Unit (JCC) and should aim at the systematic and continuous collection, analysis and use of information for the purpose of management control, identification and taking corrective action in implementing the Action Plan of the Strategy. The implementation of a monitoring and evaluation system for the Strategy for the period 2019-2025 and its implementation ensure transparency and efficiency in the implementation of the document in a dynamic context.

To track progress on individual operational objectives and investment priorities / activities, it is important to take into account the changes in the indicators presented below. Three types of indicators are used: Performance, Result and Impact. Result indicators represent the direct and immediate effects generated by the implementation of individual activities. They are tied to the priorities and objectives of the strategy document. Performance indicators measure intermediate results as compared to initial ones.

On the other hand, the impact indicators concern the achievement of the strategic objectives and evaluate the overall effectiveness of the strategy by 2025.

The system of indicators to track progress on strategy implementation is presented in the following table.

**Table 15. A system of indicators for implementation of the Action Plan**

Strategic goals and operational objectives, investment priorities/activities	Performance indicators	Result indicators	Impact indicators
<b>Strategic goal 1 : Ensuring safe navigation in the Romania-Bulgaria cross-border region with rising volumes of transported goods and passengers</b>			Providing opportunities for safe year-round traffic in the cross-border region
<b>Investment priority 1.1: Enhancement of the navigational safety of Danube river shipping by investing in equipment</b>			
<b>Operational objective 1.1.1. Improvement of the state and passability of the waterway</b>			
1.1.1.1. Monitoring of the waterway - investments in vessels for monitoring the parameters of the waterway (echolocation and other), automatic measuring stations, signs and training of the staff to work with them	Number and type of the purchased equipment Number of trained staff Number of implemented projects Amount of invested funds	Providing precise and timely information for navigation management on the Danube River	
1.1.1.2. Investments in supporting facilities (multi-purpose dredgers, barges, pontoons, maneuvering ships, pipes, navigation signs, shore lights, etc.) - providing financing, purchasing and using	Number and type of purchased facilities Number of implemented projects Amount of invested funds	Providing year-round transport traffic along the river	
<b>Investment priority 1.2: Waterway information provision</b>			
<b>Operational objective 1.2.1. Improvement and development of navigation river information system</b>			
1.2.1.1. Completing the development and deployment of RIS base modules	Number of implemented base modules Amount of absorbed funds	Fully completed RIS, which provides river navigation information and communication	
1.2.1.2. Planning and development of new RIS modules	Number of implemented new modules Amount of absorbed funds	RIS, which is corresponding to the contemporary technological development.	
1.2.1.3. Full integration and permanent exchange of data with other RISs that provide information on shipping across the Danube	Achieved level of integration Amount of absorbed funds	Achieved communication between RIS of the countries on the Danube River	
1.2.1.4. Continuous development and provision of convenient user interface to RIS	Level of user satisfaction from the RIS interface Amount of absorbed funds	Interface, which facilitates information analysis and decision making	
<b>Strategic goal 2: Enhancing the capacity of the institutions responsible for navigation safety on both sides of the Danube River in Romania and Bulgaria and developing cross-border cooperation with all stakeholders</b>			The institutions responsible for navigation are competent, motivated and cooperate with each other in navigation management
<b>Investment priority 2.1: Human capital development</b>			
<b>Operational objective 2.1.1. Staff training and development</b>			
2.1.1.1. Providing ongoing training, improvement and staff development	Number of trained staff Number of implemented projects Amount of absorbed funds	Availability of well-trained and motivated staff for navigation management on the Lower Danube	
2.1.1.2. Developing capabilities for analysis and management of navigation risk	Number of conducted seminars on analysis and navigation risk management Presence of implemented analysis and navigation risk management systems	Improved navigation risk management	
<b>Investment priority 2.2: Co-ordination, co-operation and participation in joint projects</b>			
<b>Operational objective 2.2.1. Development of the authorities responsible for navigation in the cross-border region</b>			
2.2.1.1. Investments in the material base for ensuring the operational activity	Creating modern and high tech material base for implementation of the operational activity		
2.2.1.2. Encouraging co-operation and participation in professional networks	Number of participation in networks Number of developed projects in the networks with Bulgarian and Romanian participation Amount of attracted external resources	Participation in professional networks, which improve the navigation management	
2.2.1.3. Improving the capacity for participation and implementation of international and national projects	Number of conducted trainings on project preparation and project management Number of trained staff Number of implemented projects Amount of attracted funds Amount of absorbed funds	Developed and successfully implemented international and national projects for development and enhancement of the navigation service safety	
2.2.1.4. Improving the coordination, collection and exchange of information with ports and river port operators	Volume of the information exchanged with ports and operators	Improved communication and information exchange with ports and port operators	

## 7. Recommendations

The recommendations made are not a summary of the material developed. The task of the recommendations is to facilitate the implementation of the Strategy and the Action Plan. Therefore, they have a pragmatic character and are directly geared towards the management of responsible authorities and institutions.

Thus, when implementing the document, attention should be paid to the following features arising from the subject matter of the contract:

1. The Strategy and Action Plan developed shall include in the Framework Strategy Documents relevant to the Lower Danube Navigation Safety but shall not override or duplicate them. They are fully focused on the issues of navigation safety. Any change to the other strategic documents to be expected in the next programming period 2021-2017 in the EU should be reflected in the Strategy and the Action Plan.
2. The strategy and the action plan are intended to be implemented by authorities and institutions from the Bulgarian and Romanian sides. For this purpose, a Joint Co-ordination Unit is set up. As a basic principle in the implementation of the Strategy, therefore, the partnership between the participating countries must be drawn. Only with joint efforts and coordinated actions will it be possible to improve navigation safety on the Lower Danube. The river is one, the waterway is one, but its safety must be taken care of by two sides and different institutions on both sides of the river.
3. The action plan is specifically written but at the same time allows for flexibility and specification according to the chosen technical solutions and market situation at the time of purchase of the equipment or the provision of the service. In this way, conditions have been created to meet the needs of users and apply the principle of optimal spending of resources.
4. The strategy and action plan cover a long period of 2019 to 2025, during which serious changes in the external environment of the two countries will occur. It is therefore necessary to make more serious changes to it so that it appropriately reflects the new moments and the document is adequate to the environment and the signals it broadcasts.

5. A system for monitoring and reporting on the implementation of the Strategy and Action Plan has been developed. It is desirable that the performance of this activity be designed alongside the start of implementation of the Strategy so as to feed the managing authorities with timely and accurate information on what and how it happens in the realisation of all activities. This will enable corrective impacts to be achieved and ensure that the intended objectives are achieved smoothly.

## Reference list

CEC, WHITE PAPER: European transport policy for 2010: time to decide (COM(2001) 370 final), Brussels: Commission of the European communities, 2001; Commission du Danube, Dispositions fondamentales relatives a la navigation sur le Danube, 2010.

Danube Commission. Recommendations for ensuring the security of navigation on the Danube, 2014.

Danube region strategy, Mobility, Waterways, Fairway rehabilitation and maintenance master plan – Danube and its navigable tributaries, version 13 November 2014.

EC, EU Transport In Figures – Statistical Pocketbook 2017.

EC. EU Strategy for the Danube Region, 2010.

ESPO. The Infrastructure Investment Needs and Financing Challenge of European Ports, 2018.

EU Strategy for the Danube Region. Fairway Rehabilitation and Maintenance Master Plan – Danube and its navigable tributaries, 2014.

FAIRway Danube. Fairway Rehabilitation and Maintenance Master Plan for the Danube and its navigable tributaries: National Action Plans, 2017.

Flanders Investment & Trade. Transport Infrastructure, Transportation and Logistics in Romania, 2016.

Gift Transport Network Proposals (Corridor VII).

Giurgiu Danube River ports administration, Total traffic in 2015, 2016, 2017.

Gucma, L. Navigational safety management, 2011, Maritime University of Szczecin.

Institutul Național de Statistică Transportul portuar maritim de mărfuri și pasageri 2017, 2018.

International Commission for the Protection of the Danube River, Danube Commission and the International Sava River Basin Commission. Development of Inland Navigation and Environmental Protection in the Danube River Basin, 2009.

Inventory of Main Standards and Parameters of the E Waterway Network, “Blue Book”, second revised edition, UNECE, 2012.

Ionescu R.-V. Inland Waterways' Importance for the European Economy. Case Study: Romanian Inland Waterways Transport Journal of Danubian Studies and Research, Vol 6, No 2 (2016).

Koralova P. Specifics of the Danube Fleet Management, Economic Studies, 6, 2017, pp. 118-152.

Master Plan General de Transport al României – AECOM, Ministerul Transporturilor, 2016.

NC Administration of Danube river ports SA, Administration and maintenance of ports infrastructure, Letter Nr2090/05/15/2018.

Panteia, KTI, PRC and Planco RIS implementation survey and policy evaluation. Country Reports, 2014.

PINE, Prospects for Inland Navigation within Enlarged Europe, full final report, 2004,

SC Fip Consulting SRL. Study on Waterways Planning in CBC Region, 2018.

Scholten, An., B. Rothstein. Navigation on the Danube - Limitations by low water levels and their impacts, 2016.

Strategia de Dezvoltare Economico-Socială a Județului Dolj pentru perioada 2014-2020, Consiliul Județean Dolj, Craiova, 2015.

Strategia de transport intermodal în România 2020 - Ministerul Transporturilor și Infrastructurii, mai 2011.

T. Bačkalić, M. Maslarić. Navigation Conditions and the Risk Management In Inland Waterway Transport on the Middle Danube, Transport Problems, Volume 7 Issue 4, 2012.

UNECE, Blue Book, 2012.

United Nations Economic Commission for Europe, Inland Transport Committee, European agreement on main inland waterways of international importance (AGN), Geneva, 19 January 1996.

United Nations Economic Commission for Europe, Inland Transport Committee, Working party on Inland water transport, White Paper on Efficient and Sustainable Inland Water Transport in Europe, New York and Geneva, 2011.

viadonau, Annual Report on Danube Navigation in Austria 2016.

viadonau, Manual on Danube Navigation, 2013.

viadonau. Good Practice Manual on Inland Waterway Maintenance. Focus: Fairway maintenance of free-flowing rivers, 2016.

viadonau. Reader – Legal aspects of inland navigation, 2012.

viadonau. Reader – The Danube Waterway – Economic Geography, 2012.

viadonau. STRATEGY 2020. Ambitions, Objectives and Core Activities, 2016.

Bilateral Agreement between the Governments of Romania and the People's Republic of Bulgaria, Sofia, 1955

DZZD "TEN-T Networks - Preliminary Studies", Strategy for improving the capacity of the TEN-T network by improving the capacity of intermodal nodes in the cross-border region Romania - Bulgaria, 2017.

European Agreement on Major Inland Waterways of International Importance.

EC. Connecting Europe Facility, European Commission, Brussels, 2011.

EC. A new EU transport infrastructure policy - basic information; MEMO / 13/897, EC Information Note, Brussels, 2013.

EC. Digital Inland Waterway Area Towards a Digital Inland Waterway Area and Digital Multimodal Nodes, 2017.

EC. Funding guide for inland waterway transport in Europe, 2008.

EC. Good Navigation Status. Guidelines towards achieving a Good Navigation Status, 2018.

Law on Maritime Spaces, Inland Waterways and Ports of the Republic of Bulgaria, Prom. State Gazette, no. 12 of 11.02.2000

Order 946/2005 of the Minister of Finance of Romania for the approval of the Internal Control / Management Code, including the standards for internal control / management of public companies and for the development of internal control systems, subsequently amended and supplemented.

Integrated Strategy for Sustainable Development of the Danube Delta - No 602/2016 (Romania).

INTERREG V - A Romania - Bulgaria /Joint Programming Document/.

Code of Commercial Shipping (Official Gazette, issue 55 of 14.07.1970), Ministry of Transport, Information Technologies and Communications, Sofia, 1970.

Convention on the Navigation of the Danube River (the Belgrade Convention of 1948).

Interim report on the closure of the programs co-financed by the European Union and the countries of the European Economic Area for the 2007-2013 programming period as well as the progress made under the programs for the programming period 2014-2020 (according to data as at 30 June 2016 y).

Council of Ministers. National Strategy for Integrated Development of the Infrastructure of the Republic of Bulgaria and Operational Implementation Plan 2006-2015, Sofia, 2006.

MTITC, Operational Program "Transport and Transport Infrastructure" 2014-2020 ", Ministry of Transport, Information Technology and Communications of the Republic of Bulgaria, Sofia, 2014.

MTITC. Integrated transport strategy for the period up to 2030, Sofia, 2017

Ordinance No 9 of 17 October 2013 on the requirements for operational suitability of ports and specialised port facilities.

National Management Plan of the Romanian part of the Danube International Basin - No 859/2016. on 16 December 2016 (Romania).

National Strategic Plan for Water Optimisation and Maintenance in Romania 2011-2020



National Development Program: Bulgaria 2020

National Reform Program 2017 (Romania).

National Strategy for Transport Development (Romania).

Romania's National Sustainable Development Strategy 2013-2020.

Regional Strategy for Development of the Montana Region 2014-2020

Regional Strategy for Development of the Ruse Region 2014-2020

Common Strategy for Sustainable Territorial Development of Romania-Bulgaria Cross-Border Region, 2015.

Municipal Development Plan of Gulyantsi Municipality for 2014-2020

Municipal Development Plan of the Municipality of Dolna Mitropoliya for the period 2014-2020

Activity Report of the Executive Agency "Exploration and Maintenance of the Danube River" in 2017, 2018.

Southwest Development Development Plan 2014-2020 (Romania).

Southeast Development Development Plan 2014-2020 (Romania).

Development Plan for the Southern Region for Development 2014-2020 (Romania).

Management Plan of the International Danube River Basin for the Period 2016 - 2021

River Basin Management Plan in the Danube Region 2016-2021. (adopted by Decision № 1110 / 29.12.2016 of the Council of Ministers).

Regional Development Plan for the North Central Region 2014-2020, adopted by Council of Ministers Resolution No. 461 / 01.08.2013 (Bulgaria).

Regional Development Plan for the North-West Region 2014-2020, adopted by Council of Ministers Decision No. 459 / 01.08.2013 (Bulgaria).

Regional Development Plan for the Northeast Region 2014-2020, adopted by Council of Ministers Decision № 460 / 01.08.2013 (Bulgaria).

Regulation (EU) No 1315/2013 of the European Parliament and of the Council of 11 December 2013 on Union guidelines for the development of the trans-European transport network and repealing Decision No 661/2010 / EU, Official Journal of the European Union; L 348/1 of 20.12.2013, Brussels, 2013.

Regulation (EU) No 1315/2013 of the European Parliament and of the Council of 11 December 2013 on Union guidelines for the development of the trans-European transport network and repealing Decision No 661/2010 / EU, Official Journal of the European Union, L 348/1 of 20.12.2013, Brussels, 2013.

Government Decision No 518 of 24 August 1998 of the Romanian Government for the establishment of the National Company “Maritime Administration of the Danube Ports” - SA Galați.

Government Decision No 520 of 24 August 1998 of the Romanian Government for the establishment of the National Company “Administration of Danube Ports” - SA Giurgiu.

Decision No 92/2 of the European Commission of Transport Ministers, Brussels, 1992.

Council Decision No 192 of 25 March 2015 on the functioning of the National Coordination Mechanism for the implementation of the European Union Strategy for the Danube Region.

Agreement between the Government of the People's Republic of Bulgaria and the Government of the Romanian People's Republic on the maintenance and improvement of the fairway in the Bulgarian-Romanian section of the Danube from 1955

## Annex 1. Summary matrix of the Action Plan

Strategic goals and operational objectives, investment priorities/activities	Responsible institution and partners	Deadline	Financial resources, mln euro	Expected results	Performance indicators	Result indicators	Impact indicators
Strategic goal 1: Ensuring safe navigation in the Romania-Bulgaria cross-border region with rising volumes of transported goods and passengers							Providing opportunities for safe year-round traffic in the cross-border region
<b>Investment priority 1.1: Enhancement of the navigational safety of Danube river shipping by investing in equipment</b>							
<b>Operational objective 1.1.1: Improvement of the state and suitability of the waterway</b>							
1.1.1.1. Monitoring of the waterway - investments in vessels for monitoring the parameters of the waterway (echo sounding and other), automatic measuring stations, signs and training of the staff to work with them	EAEMD/CN APDF SA Giurgiu/CN APDM SA Galati	2019 - December 2022	18	Number of new ships for waterway monitoring Purchased and installed new automatic measuring stations Staff, trained to work with the new equipment	Number and type of the purchased equipment Number of trained staff Number of implemented projects Amount of invested funds	Providing precise and timely information for navigation management on the Danube River	
1.1.1.2. Investments in supporting facilities (multi-purpose bridges, barges, pontoons, mooring ships, pipes, navigation signs, shore lights, etc.) - providing financing, purchasing and using	EAEMD/CN APDF SA Giurgiu/CN APDM SA Galati	2019 - December 2022	20	Purchased new dredging vessels Purchased new barges Purchased new pontoons, pipes, etc. Purchased and installed new navigation signs	Number and type of purchased facilities Number of implemented projects Amount of invested funds	Providing year-round transport traffic along the river	
<b>Investment priority 1.2: Waterway information provision</b>							
<b>Operational objective 1.2.1: Improvement and development of navigation river information system</b>							
1.2.1.1. Completing the development and deployment of RIS base modules	SEP/Romanian Naval Authority	2019 - December 2020	1	Developed and implemented all RIS base modules in both countries	Number of implemented base modules Amount of absorbed funds	Fully completed RIS, which provides river navigation information and communication	
1.2.1.2. Planning and development of new RIS modules	SEP/Romanian Naval Authority	2021 - December 2024	1,5	Developed new functional RIS modules	Number of implemented base modules Amount of absorbed funds	RIS, which is corresponding to the contemporary technological development	
1.2.1.3. Full integration and permanent exchange of data with other RIS that provide information on shipping across the Danube	SEP/Romanian Naval Authority	2019 - December 2025	0,5	Fully integrated data bases	Achieved level of integration Amount of absorbed funds	Achieved communication between RIS of the countries on the Danube River	
1.2.1.4. Continuous development and provision of convenient user interface to RIS	SEP/Romanian Naval Authority	2019 - December 2025	1	User friendly RIS interface	Level of user satisfaction from the RIS interface Amount of absorbed funds	Interface, which facilitates information analysis and decision making	
Strategic goal 2: Enhancing the capacity of the institutions responsible for navigation safety on both sides of the Danube River in Romania and Bulgaria and developing cross-border cooperation with all stakeholders							The institutions responsible for navigation are competent, motivated and cooperate with each other in navigation management
<b>Investment priority 2.1: Human capital development</b>							
<b>Operational objective 2.1.1: Staff training and development</b>							
2.1.1.1. Providing ongoing training, improvement and staff development	EAEMD/CN APDF SA Giurgiu/CN APDM SA Galati	2019 - December 2025	0,35	Conducted staff training for developing new skills and acquiring new knowledge	Number of trained staff Number of implemented projects Amount of absorbed funds	Availability of well-trained and motivated staff for navigation management on the Lower Danube	
2.1.1.2. Developing capabilities for analysis and management of navigation risk	EAEMD/CN APDF SA Giurgiu/CN APDM SA Galati	2019 - December 2020	0,2	Created and used navigation risk management system Presence of implemented analysis and navigation risk management systems	Number of conducted seminars on analysis and navigation risk management Presence of implemented analysis and navigation risk management systems	Improved navigation risk management	
<b>Investment priority 2.2: Co-ordination, co-operation and participation in joint projects</b>							
<b>Operational objective 2.2.1: Development of the authorities responsible for navigation in the cross-border region</b>							
2.2.1.1. Investments in the material base for ensuring the operational activity	EAEMD/CN APDF SA Giurgiu/CN APDM SA Galati	2019 - December 2023	0,5	Number and type of purchased equipment Number of implemented projects Amount of invested funds	Creating modern and high tech material base for the implementation of the operational activity		
2.2.1.2. Encouraging co-operation and participation in professional networks	EAEMD/CN APDF SA Giurgiu/CN APDM SA Galati/SEP/Romanian Naval Authority	2019 - December 2025	0,1	Integration of Bulgarian and Romanian institutions in European networks	Number of participations in networks Number of developed projects in the networks with Bulgarian and Romanian participation Amount of attracted external resources	Participation in professional networks, which improves the navigation management	
2.2.1.3. Improving the capacity for participation and implementation of international and national projects	Ruse Municipality/Giurgiu Municipality/EAEMD/CN APDF SA Giurgiu/CN APDM SA Galati/SEP/Romanian Naval Authority	2019 - December 2021	0,1	Available capacity for project preparation and project management Successful project proposals and project management	Number of conducted trainings on project preparation and project management Number of trained staff Number of implemented projects Amount of attracted funds Amount of absorbed funds	Developed and successfully implemented international and national projects for development and enhancement of the navigation service safety	
2.2.1.4. Improving the coordination, collection and exchange of information with ports and river port operators	EAEMD/CN APDF SA Giurgiu/CN APDM SA	2019 - December 2025	0,2	Improved coordination and communication with ports and port operators	Volume of the information exchanged with ports and operators	Improved communication and information exchange with ports and port operators	