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Work Package 6

Activity 6.1

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Executive summary

The SWOT analysis is a frequent analytical tool used for the formulation of strategies. It uses both internal and external perspective or influencing factors of the subject under analysis. Internal perspective focuses on the appraisal of strengths and weaknesses within an organization or institution under analysis, whilst an external perspective focuses on threats and opportunities in an environment in which the analysed organization or institution works. The SWOT analysis has a clearly identifiable, strategic goal, meant to reveal outside opportunities and threats that have a potential to influence the future of a port or entire port industry. Once identified, these opportunities and threats may suggest potential remedial or mitigating measures that could be applicable under certain conditions. On the other hand, an internal analysis or a port's strengths and weaknesses is intended to highlight determined strategies that the port can exploit and, especially, to spotlight certain practices that the port may need to correct. The SWOT analysis is used to spotlight the dominant and determining factors, both external and internal in relation to the port or port industry (country-wide) under analysis, which would probably have influence on the success of the port. In addition, this tool is used as a source of guidelines for development strategies by linking the port to its environment. The SWOT analysis' aim is to provide the high level of input information and therefore reduce uncertainties in the process of strategy drafting and implementation planning.

The SWOT analyses in this report are elaborated having in mind the learning function of this type of analyses since the SWOT analyses in this report will be a major input for the "Danube Port Development Strategy and Action Plan". Strategy formation is a continuous learning process of "learn by doing". Strategies are therefore subject to revisions and periodic updates, with consequent adaptations of action plans for strategy implementation, meaning that no SWOT aspect will remain "cemented" and will be subject to periodic revision during the life cycle of the future strategy.

A total of 21 ports in the Danube region were subject to SWOT analysis. Based on these 21 SWOT analyses, a country wide SWOT analyses of port industries in Austria, Slovakia, Hungary, Croatia, Serbia, Romania and Bulgaria were elaborated, reflecting the current situation of the respective port industries, taking into account the internal (with respect to the port industry) strengths and weaknesses and external threats and opportunities.

In order to facilitate a provision of harmonized inputs for the future "Danube Port Development Strategy and Action Plan", a "Common SWOT analysis" was created involving the most important strengths, weaknesses, threats and opportunities of the entire Danube area port industry as a single "entity" with a single "voice". This is a very important and crucial precondition for the future port development strategy.

Apart from this, for the purposes of the widest possible overview, a so called "Cumulative SWOT analysis" was prepared, where all strengths, weaknesses, threats and opportunities were accumulated in one SWOT matrix and per each country involved in the SWOT elaboration.

Ports in the Danube area need to build their future development on the fact that they are located along an important European multimodal transport corridor, officially titled as the "Rhine-Danube Core Network Corridor". This creates a significant number of opportunities for growth and for important financial injections needed for infrastructure development through the European Commission funding (Connecting Europe Facility - CEF funding). All Danube ports are directly connected with the seaport of Constanta, acting as a gate, or the "Rotterdam of the East" for virtually all Danube countries. This gives them a comparative advantage over other transport routes in terms of cost efficiency, generalized transport costs and even cost of externalities. Corporatization of port authorities is also seen as one of the strengths on which future development directions should be built, as this port management model provides sufficient flexibility to port authorities to react on market dynamics and changes in demand for different port operating services, including the value added services.

Thanks to the growing reintroduction of industrial production in the ports or in their immediate vicinity, Danube ports have the opportunity to exploit this phenomenon and use it to their own advantage, by offering the industry a quick, competitive and reliable service and the benefits of the economies of scale offered by inland waterway transportation. This implies that the ports efforts are combined with the efforts to improve the navigability, especially in the critical sectors on the Danube and Sava, and thus increase the overall reliability of inland waterway transportation in the Danube area. Additional opportunities at disposal of the Danube port industry are new markets, cargo flows that will emerge along the transport route from the Far East ("One belt one road"), as well as the growing interest of young professionals towards the port industry.

Unfortunately, apart from the above mentioned strengths and opportunities, Danube ports have a number of weaknesses which will need to be neutralized, minimized or completely eliminated when and if possible. Most notable weaknesses focus around the excess capacity or low utilization of the available capacities, as well as lack of resources for provision and improvement of high quality road and rail connections of ports with the rest of the network. Insufficient lobbying for interests of ports is also seen as one of the common weaknesses of the entire Danube port industry.

Last, but not least, port industry in the Danube area is faced with a number of threats which are external to ports themselves, but which call for measures to mitigate or remedy such threats. Most important threats for the Danube area port industry are still persisting navigation hindrances along the Danube, overall economic situation in Southeast Europe, fierce competition of road and rail sectors feeding the industrial and commercial sectors along the Danube directly from nearby seaports of Koper, Rijeka, Trieste and even from the farther ports in the Northwest Europe, like Rotterdam, Amsterdam, Antwerp, Hamburg and others.

1 Introduction

All the findings of the previous WPs are reflected in this last work unit that sets-up the Danube Ports Network and provides the Danube Ports Development Strategy and its accompanying Action Plan. This permanent working platform for ports not only facilitates the know-how exchange between its members but also promotes and makes use of a set of jointly elaborated guidelines and recommendations that will be made available to more than 60 ports in the region.

The work is split into three activities and each contributes to facilitate communication and collaboration in the region and provides the necessary tools for an unhindered exchange of information between the members.

To begin with, the focus is to determine the objectives and goals necessary to address the challenges faced by the Danube ports (poor & obsolete infra-&super-structure, insufficient funding sources, diverse regulatory framework, etc.).

This will be achieved in act. 6.1 who will produce the Danube Port Development Strategy & Action Plan. Next, the efforts of the DAPhNE PPs will be concentrated on setting-up and enlarging the Danube Ports Network (6.2). The manner in which the network will run, its members and the means it will employ and promote the DAPhNE outputs and results will be clarified in this section. To ensure the network's durability, special documents like a Financing Model and a Business Plan will be elaborated. Furthermore, there will also be a work program drafted to set the short & mid-term priorities of the Danube Ports Network.

Last but not least, the pilot operation of the Danube Ports Network Organization will be tested in activity 6.3. The organization will host its initial meeting and will start implementing its yearly work plan. Special events like the Danube Port Days and the Port Policy Days will be organized as biennial events to facilitate networking possibilities within the port community and also help consolidate the market visibility of its members.

1.1 Objectives of the activity 6.1

The work performed in the previous WPs will serve as input for the elaboration of output 6.1. The information gathered on the port legislation, the public funding aspects, the administrative issues as well as the port development part will help better prepare the SWOT analysis for the Danube Ports (IWT & maritime ports). In line with this document a set of objectives and goals will be established for solving the challenges faced by the Danube Ports. These will also be showcased in the Danube Ports Development Strategy.

The consortium will also elaborate a report on the Role of Danube Ports now and in the future, taking into account the potential these locations have as multimodal hubs in the European Transport Network and how innovative technologies and concepts can help them consolidate this status.

In addition to these deliverables, the consortium members will also analyze the broader European framework containing strategic documents regarding the Danube region. The

investigations will be related to the EUSDR and the work performed by the secretariats of the various priorities as well as the Rhine-Danube Corridor.

The Danube Ports Development Strategy & the Action Plan should reflect the work performed by these units and provide implementation measures that take into account the opportunities available (valid funding schemes, new legislation in force, bureaucratic issues and other types of bottlenecks, etc.). The purpose of this activity is to produce a working document that is used at regional level. The Strategy & the Action Plan present the next steps to be taken to reach the EU objectives for the Danube region while also complying with the national port development needs & priorities of the riparian countries.

2 Scope of the report

This report will encompass major issues important for the assessment of strengths, weaknesses, opportunities and threats of the representative Danube ports. Due to the huge number of Danube ports the study team agreed to provide high-quality SWOT of 21 selected ports along the Danube and its tributaries, including the most important "gate" for the Danube ports – the seaport of Constanta.

Following ports are selected for detailed analysis in this report:

- Austria: Enns and Vienna
- Slovakia: Bratislava and Komarno
- Hungary: Budapest, Baja, Dunaújváros and Győr-Gönyű
- Croatia: Vukovar and Slavonski Brod
- Serbia: Belgrade and Novi Sad
- Bulgaria: Lom, Ruse and Vidin
- Romania: Drobeta Turnu Severin, Giurgiu, Galati, Braila, Tulcea and Constanta.

2.1 Analysis by country

Each partner provided a SWOT for the selected ports and, at the end of the section referring to the country in question, each partner provided a country-wide SWOT analysis of port industry, as a summary of the SWOT analysis of single ports. Strengths, weaknesses, opportunities and strengths that are common for all ports in one country are emphasized in the country-wide SWOT and are the basis for the future Danube ports development strategy.

2.2 Overall SWOT analysis for the ports in the Danube region

An overall SWOT analysis of the entire port industry in the Danube area is given based on the inputs of the project partners for each of the selected ports SWOT analyses and on the country-wide analyses.

3 SWOT Analysis as a basis for development strategies

3.1 Introduction to SWOT analysis as a decision-making tool

The SWOT analysis is a frequent analytical tool used for the formulation of strategies. It uses both internal and external perspective or influencing factors of the subject under analysis. Internal perspective focuses on the appraisal of strengths and weaknesses within an organization or institution under analysis, whilst an external perspective focuses on threats and opportunities in an environment in which the analysed organization or institution works. The analysed organization (or even entire industrial sector), obviously, has different degrees of control of an internal and external perspective. External environment is therefore less "controllable" due to its dynamic and largely unrestricted nature and thus has a serious capacity to hamper the process of detailed strategy planning. On the other hand, internal perspective, or internal factors, are more "controllable" and therefore tend to be easier to manage by the organization under analysis.

The SWOT analysis has a clearly identifiable, strategic goal, meant to reveal outside opportunities and threats that have a potential to influence the future of a port or entire port industry. Once identified, these opportunities and threats may suggest potential remedial or mitigating measures that could be applicable under certain conditions. On the other hand, an internal analysis or a port's strengths and weaknesses is intended to highlight determined strategies that the port can exploit and, especially, to spotlight certain practices that the port may need to correct.

The four elements of a SWOT analysis undertaken as part of a wider strategic planning in port industry are presented in the following figure.

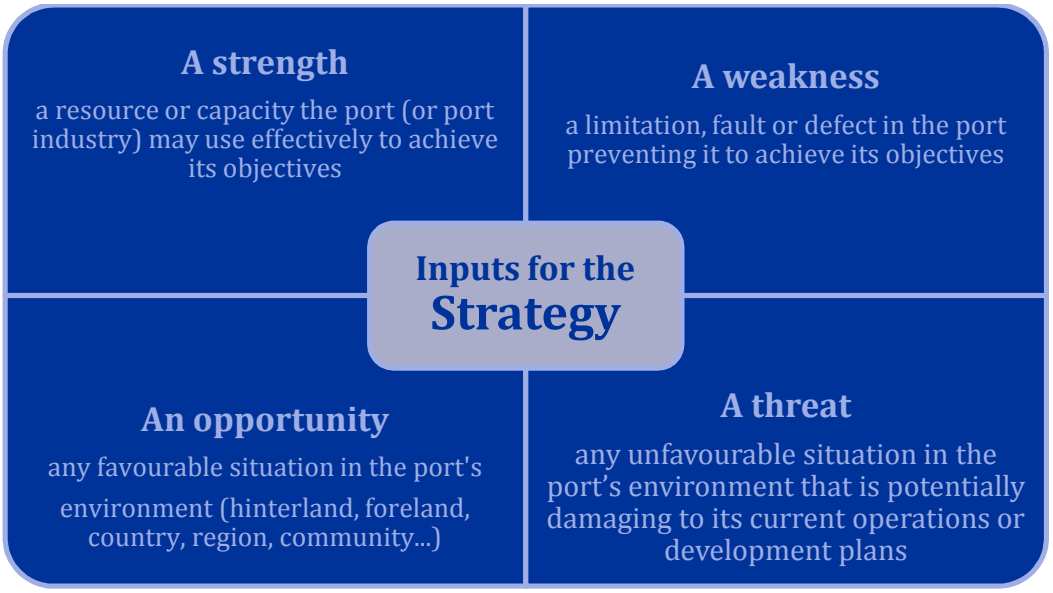

Figure 1: SWOT elements as inputs for development strategies

The four elements of the SWOT analysis suggest the following actions to be taken in a port development strategy:

- *Bolster* strengths and *build* on them.
- *Neutralize* or *eliminate* weaknesses.
- *Exploit* and *make use of* opportunities.
- *Mitigate* or *remedy* the effects of threats.

The SWOT analysis is used to spotlight the dominant and determining factors, both external and internal in relation to the port or port industry (country-wide) under analysis, which would probably have influence on the success of the port. In addition, this tool is used as a source of guidelines for development strategies by linking the port to its environment. The SWOT analysis' aim is to provide the high level of input information and therefore reduce uncertainties in the process of strategy drafting and implementation planning.

All SWOT analyses are highly contents-sensitive and need to be thoroughly developed if they want to be used as a useful tool in strategic planning within the port industry. This is why it is very important that the SWOT analyses are not of purely academic nature, but that they are an empirical, facts-based exercise. Therefore, the overall strategy formation process will be facilitated as a top-down, systematic and rational process. Following a process of strategy formation, a stage of implementation and actions becomes triggered.

Every SWOT analysis faces a problem of the right balance between external and internal factors. This, inter alia, includes a problem of an honest, straightforward and thorough internal analysis of a single port or a national port industry, as well as a whole array of unforeseen difficulties and uncertainties related to external factors. If these uncertainties are related to the current situations and various consequences of different potential strategic choices, the uncertainty in any strategic choice is a usual characteristic of the analysis process. In this case, the strategist can work only with conditional alternative actions. This, again, makes the importance of a thorough, honest, fact-based and straightforward SWOT analysis all the greater. This is why the output 6.1 "Danube Port Development Strategy and Action Plan" will involve making strategic planning and implementation a more inter-woven process where both strategy and action plan will be parts of a single interactive process.

Port development strategies of a single port or of an entire port industry of a country or even of the port industry in a region of a continent should always be formulated objectively. However, the objectivity of the action plans for the implementation of the drafted strategy often depends on the person or organization implementing the strategy. This is why the entire process of strategy making and strategy implementation should be consensus-oriented as much as possible. A process organized like this, would make the action plan for strategy implementation (decisions on how, and by what means the strategy should be implemented) a level-playing field where subjectivity and objectivity meet for the common goal.

In general, the following figure demonstrates the "golden rules" for any SWOT analysis aimed to be an input for the development strategy and its implementation plan.

Figure 2: Golden rules of SWOT analysis

(Source: https://www.professionalacademy.com/blogs-and-advice/marketing-theories---swot-analysis)

3.2 Learning function of SWOT analysis

Strategy formation is a continuous learning process of "learn by doing". Strategies are therefore subject to revisions and periodic updates, with consequent adaptations of action plans for strategy implementation. Let us assume that the particular learning process within the strategy formation consists of four stages: experiencing, reviewing, concluding and planning, and that they are mutually supportive. It is therefore clear that a strategic planning process cannot simply consist of performing a SWOT analysis and its implementation. Instead of that, port sector development is seen as reiterative process of analyses, reassessments and evaluations, as well as implementation including its relevant updates. This approach enables us to have useful insights into the strengths and weaknesses within the port development process itself.

Once the SWOT analysis is undertaken having its learning function in mind, the implementation of the SWOT (in the development strategy and its accompanying action plan) should include the following stages:

- Inventory of the development strategy: identification of the major trends and setbacks that might influence the prospects of the development of a port or port sector as a whole through consideration of a variety of legislative, strategic, planning, operational, geographical, managerial, administrative, financial, technological, traffic, logistic and trade aspects of port management, operation and development.
- Identification of possible actions.
- External analysis of opportunities and threats, including a list of factors of the environment in which ports are working and which are not under direct control of port authorities but which can exert a strong influence on further development of a port or entire port industry in a country.
- Internal analysis of strengths and weaknesses, including a list of parameters which are at least partially under control of a port authority and which can either boost or restrict the port development.
- Identification and inventory of possible actions.
- Assessment and evaluation of a strategy resulting in a portfolio of activities, including a programme of interventions which, on the one hand, build up on strengths and exploit opportunities, and, on the other hand, mitigate weaknesses and combat threats. These interventions need to be places along two directions: internal feasibility, strengths and weaknesses and external environment, opportunities and threats.

4 Austria

4.1 Port of Enns SWOT Analysis

4.1.1 Introduction

Ennshafen Port is located on river km 2112 in the mouth of river Enns to the Danube at the border between the federal states of Upper Austria and Lower Austria. The port in total is the largest connected industrial area on the upper Danube, it is a combination of business park areas and port areas in close connection. Ennshafen port offers optimal trimodal transportation logistics for export and connects the entire region with international transportation network. Circa 55 companies with together ca. 2300 employees represent the whole conglomerate at present. The port is one of two TEN-T-core ports (Rhine-Danube corridor waterway) in Austria. Ennshafen OÖ GmbH – a company owned by the federal district of Upper Austria - is the owner of the port and is in charge of the administration of the port; Ennshafen port has the PPP-principle as a core part of its strategy, therefore it only builds the basic infrastructure, while the suprastructure is financed by private companies having special contracts with EHOÖ (licence contracts and shipment contracts); Certain core parts of the port (quays) are part of a greater mixed area, where a lot of other private companies are owners of land, buildings and facilities, making it difficult to find exact limits between “port area” and “additional private area” and to get statistic figures, because sometimes a “working area” is a mixture between licence area and own area of a partner company. Even in Lower Austria the port company Ennshafen NÖ GmbH is owned by the federal district having a quite similar structure like in Upper Austria. The port area is about 352 ha (110 ha are owned by the port authorities (Ennshafen OÖ GmbH und Ennshafen NÖ GmbH) and 242 ha are owned by other private companies. Currently, a total of around 50 ha are not covered with assets or other investments. The port has 2 basins and several quays along the river side (Enns), the port service time (waterside) is the whole week (7/24 – 168 h/w), the several transhipment stations and service providers have got 24/7 systems due to efforts to meet the market demand.

Figure 3: Port of Enns

(Source: Ennshafen OÖ GmbH)

4.1.2 SWOT analysis

Main elements of the SWOT analysis (5 factors taken out of the country-wide SWOT analysis of the port industry) for Ennshafen port are given in Table 1 below.

Table 1: SWOT matrix for the Port of Enns

Strengths	Weaknesses
• Good location on national level • Modern standards • Heart of Europe (TEN-T network) • Experience in demand-driven development • Trimodality	• Low capacity utilization • Insufficient strategic dimensions • Public economic situation • Slow business development • Business models

Opportunities	Threats
• Decarbonisation • New markets • Rail cargo attractiveness • Containerization of cargo • Infrastructure flexibility	• Problems with Danube navigability • Stricter environmental regulations • International (global) economy • Emigration of industry • Road & rail competition

(Source: Ennshafen OÖ GmbH)

4.1.2.1 Strengths

Good location on national level: optimal geographic location of the ports in Austria; close distances to the well-developed regions and industrialized centres; good economic regional surroundings.

*Modern stand*ards: ports of Austria are well developed and provide very good and modern infrastructure standards with sufficient capacity installed (huge investments in the last decades), including intermodal terminals with great capacities are installed.

Heart of Europe (TEN-T network): Austria has strategic preferred location and position in the centre of Europe, all the ports are located directly along the trans-European axis TEN-T – Rhine-Danube, Baltic-Adriatic, Baltic-East Med).

Experience in demand-driven development: Austrian port sites have been developed over decades by „organic growing" in close connection with general business development & growing, meaning that the ports have not been standalone elements of infrastructure but directly integrated in business circles.

Trimodality: excellent modal split is developed; trimodality is state of the art operation in Austrian ports (rail-road-IWW); proximity and good connections to international airports (European regional hub Vienna).

4.1.2.2 Weaknesses

Low capacity utilization: low capacity utilization factors of installed waterside infrastructure; excess capacity for water-side transshipment is available and the port is facing a decreasing water cargo statistics in Austria; even the whole Danube in Austria is still used to a quite small rate compared to the river Rhine.

Insufficient strategic dimensions: port areas (including industrialized zones) have got insufficient dimensions in relation to the master planning items; new dedication of areas is very problematic (neighbourhood, distances to others, special zones – Natura 2000, Seveso, etc.) – process industry as a huge mass driver needs large spaces.

Public economic situation: new great investments are a challenge according to actual economic and financial situation of public sector in general in Austria.

Slow business development: port business is a sector with slow technological development, long modernization cycles, no dynamic intrinsic innovation and technology shifts – therefore only low level of market attractiveness.

Business models: business models for water transshipment are old and do not support todays dynamic demands of the relevant market and client needs; due to public ownership the ports are faced with relatively complex decision processes and supervising structures.

4.1.2.3 Opportunities

Decarbonisation: urgent needs for decarbonisation and low carbon transport in general an especially for the transport sector (even NOx and fine particles) - due to recent climate change regulations in Europe and the whole world, inland waterways transportation (IWT) could be a substantial part of the future solution to this problem, new approaches and written targets in relevant papers (e.g. new governmental principle paper of Austria).

New markets: new markets and cargo for the future (biomass, building materials – huge market in Austria, high & heavy, fuels, renewables, recycling, cold ware, etc. specialized forms of contract logistics); shipping energy wood, pellets, chips, round wood from Austria to Germany can bring a substantial market demand in the upcoming years.

Rail cargo attractiveness: rail-attracted business can be boosted pushed in ports development due to existing basic infrastructure with block train options (e.g. for car cargo business).

Containerization of cargo: container business will grow and bring new options for growing of Austrian ports which are still engaged in container business, even empty container management in Europe by inland waterways (IWW).

Infrastructure flexibility: creation of multipurpose transshipment infrastructure.

4.1.2.4 Threats

Problems with Danube navigability: problems with navigability of Danube, supply chains may be interrupted for long parts of the year (especially due to problems outside of Austria) – frequently lead to loss of customers or cargo.

Stricter environmental regulations: laws will bring stricter regulations and more cost for ports (especially precipitation water and pre-treatment equipment – “water frame regulations”).

International (global) economy: international economic crises may bring systems in Europe under pressure and lead to depression scenarios with low cargo flows.

Emigration of industry: relocation of heavy industry from (parts of) Europe to locations with cheaper production cost (energy regions of the world, sea coast regions - those regions where energy is directly available or produced (from ground) and situated on the maritime ports/coasts – these are the regions e.g. Saudi Arabia, Libya/Egypt, US-regions, etc. – mostly those regions where natural gas is available (or oil), because these are the important feedstock for refineries, chemical plants, fertilizer plants or steel, aluminium (where energy is used in combination with ores, etc.)).

Road & rail competition: strong competition of these two sectors, cargo shift towards road (cheap drivers) and rail (strong market pressure in combination with insufficient navigability performance).

4.2 Port of Vienna SWOT analysis

4.2.1 Introduction

The Port of Vienna has an area of 3 million square meters. Wiener Hafen group is part of the Wien Holding group and with its subsidiaries it operates three large cargo terminals including the corresponding infrastructure: Freudenau harbour, Albern harbour and Lobau oil terminal. These three harbours handle around 1,000 cargo vessels a year. The Danube is used for the transport in particular of oil products, road salt, building materials such as cement, sand or steel products, and agricultural products such as grain and fertilizers. The passenger terminal close to the Reichsbrücke and Marina Wien are also part of the Wiener Hafen group. Port of Vienna is a multifunctional service company offering decades of experience and also the latest technologies. Thanks to its optimum rail, road and water links and the proximity to Vienna International Airport in Schwechat, it provides an important and practical interface for international trade and transportation. Hafen Wien operates the largest free port in Austria. There are modern warehouses and well trained and equipped staff for the storage and handling of customs and domestic goods as well as a customs office for rapid clearance. The site is guarded round the clock and feeder roads are exempt from the night driving ban in Vienna. The three harbours on the Danube in Vienna are notable for their modern handling facilities, excellent infrastructure and dependable, well trained workers, ensuring the reliable and rapid handling of all goods, be they building materials, containers, general cargo or bulk goods.

A detailed description of our business areas, services as well as numbers and facts can be found on our homepage: www.hafenwien.com and the press release for the annual press conference in June 2016: http://www.hafen-wien.com/de/home/aktuell/news/134/Wien-Holding-Hafen-Wien-mit-Rekordergebnis-mit-Jahr-2016

4.2.2 SWOT analysis

Most important aspects of each element of the SWOT analysis for the Port of Vienna are listed in the below table.

Table 2: SWOT matrix for the Port of Vienna

Strengths	Weaknesses
• Good location on national level • Modern standards • Trimodality • Transnational connections • Qualified staff	• Low capacity utilization • Capital intensity • Business model • Lack of expansion space • Small market sector
Opportunities	**Threats**
• New city logistics • Real estate industry • One belt – one road • Containerization of cargo • Infrastructure flexibility	• Problems with Danube navigability • Stricter environmental regulations • Road & rail competition • Emigration of industry • International (global) economy

(Source: Hafen Wien)

4.2.2.1 Strengths

Good location on national level: optimal geographic location of the ports in Austria; close distances to the well-developed regions and industrialized centres; good economic regional surroundings.

*Modern stand*ards: ports of Austria are well developed and provide very good and modern infrastructure standards with sufficient capacity installed (huge investments in the last decades), including intermodal terminals with great capacities are installed.

Trimodality: excellent modal split is developed; trimodality is state of the art operation in Austrian ports (rail-road-IWW); proximity and good connections to international airports (European regional hub Vienna).

Transnational connections: very good connections to seaports in Europe in the north and west relations, also to black sea region and Adriatic seaports; in general Austrian has got a very great potential to direct connections in the middle section of the New Silk Road (one belt one road) in the eastern part of the country (new detailed plan just started recently) as well as the south section of this strategic corridor via the Danube axis.

Qualified staff: high level qualified logistic experts and workers of all levels are available in Austria; specialized education in this sector is provided.

4.2.2.2 Weaknesses

Low capacity utilization: low capacity utilization factors of installed waterside infrastructure; excess capacity for water-side transshipment is available and the port is facing a decreasing water cargo statistics in Austria; even the whole Danube in Austria is still used to a quite small rate compared to the river Rhine.

Capital intensity: high financial efforts for port investments in general and long payback rates for these huge investments; high financial thresholds for new investments and long capital binding periods lead to economic pressure.

Business models: business models for water transshipment are old and do not support todays dynamic demands of the relevant market and client needs; due to public ownership the ports are faced with relatively complex decision processes and supervising structures.

Lack of expansion space: expansion space is scarce and critical in most port areas.

Small market sector: port business in general is a small market and acts in a narrow niche, few market partners, small competition – no boosting and booming market situation with intrinsic improvement and dynamic processes.

4.2.2.3 Opportunities

New city logistics: hubs for city logistics next to urban areas; distribution centres in combination with low emission / zero emission logistics and not available free spaces and transshipment areas in city regions (high prices will force alternatives).

Real estate industry: growing "immobility business" of the port companies itself (supra structure, leasing constructions, PPP, …).

One belt - one road: close connection of the Austria Danube to the New Silk Road, especially the middle range via railway connection to eastern part of Austria and southern part via Black Sea.

Containerization of cargo: container business will grow and bring new options for growing of Austrian ports which are still engaged in container business, even empty container management in Europe by IWW.

Infrastructure flexibility: creation of multipurpose transshipment infrastructure.

4.2.2.4 Threats

Problems with Danube navigability: problems with navigability of Danube, supply chains may be interrupted for long parts of the year (especially due to problems outside of Austria) – frequently lead to loss of customers or cargo.

Stricter environmental regulations: laws will bring stricter regulations and more cost for ports (especially precipitation water and pre-treatment equipment – "water frame regulations").

Road & rail competition: strong competition of these two sectors, cargo shift towards road (cheap drivers) and rail (strong market pressure in combination with insufficient navigability performance).

Emigration of industry: relocation of heavy industry from (parts of) Europe to locations with cheaper production cost (energy regions of the world, sea coast regions, etc.).

International (global) economy: international economic crises may bring systems in Europe under pressure and lead to depression scenarios with low cargo flows.

4.3 Country-wide SWOT analysis of the Austrian port industry

This section contains the overall aspects of strengths, weaknesses, opportunities and threats which are more related to the national level, rather than solely to the local, port level, thus forming a sort of nation-wide SWOT analysis of Austrian port industry.

Table 3: SWOT matrix for the port industry in Austria

Strengths	Weaknesses
• Economic situation • Good location • Heart of Europe (TEN-T network) • Bridgehead function • Logistic competence • Hinterland hubs • Modern standards • trimodality/intermodality • Local traffic connections • Transnational connections • Qualified personnel • Containerized business • Experience in demand driven development • Austrian Danube navigability	• Low capacity utilization • Capital intensity • Business models • Lack of expansion space • Public economic situation • Railway infrastructure • Railway bottlenecks in Austria • Low investment capacity of vessel owners • Small market sector • Insufficient lobbying for ports and IWT • Dislocation of heavy industry • Small strategic dimensions • Slow business development

• via donau as successful waterway administration	
Opportunities	**Threats**
• Decarbonisation • New markets • Eco-footprint philosophy • New city logistics • Alternative fuels • Real estate industry • E-commerce • Physical internet • Rail cargo attractiveness • Agricultural focus • Regionalization of supply chains • One belt - one road • Containerization of cargo • Short distance alternatives • Modal split shift • Infrastructure flexibility • New industrial clusters	• Problems with Danube navigability • Stricter environmental regulations for ports • Road & rail competition • Containerization of cargo • Vessel owner community • Bureaucracy • Emigration of industry • Relation with the neighbourhood • Outdated laws • Decentralized production • Public economy • Lack of skilled workforce • International (global) economy • Overcapacity • Rail bottlenecks

(Source: Ennshafen OÖ GmbH and Hafen Wien)

4.3.1.1 Strengths

Economic situation: high developed industrial country Austria, good manufacturing sector, heavy industries, automotive industry.

Good location on national level: optimal geographic location of the ports in Austria; close distances to the well-developed regions and industrialized centres; good economic regional surroundings.

Heart of Europe (TEN-T network): Austria has got strategic preferred location and position in the center of Europe, all the ports are located directly along the trans-European axis TEN-T – Rhine-Danube, Baltic-Adriatic, Balkan-Eastern-Med).

Bridgehead function: bridgehead function of Austria to eastern and south-eastern European countries, IWW-connections of the whole region to ARA ports and Constanta; preferable location of international headquarters in general.

Logistic competence: very high logistic competence within the whole commercial sector: a lot of well-known international logistic companies are settled in Austria or have established their headquarters, even the whole infrastructure sector has high competence at international best practice level.

Hinterland hubs: Austria has got several important hinterland hubs of European intermodal logistic and traffic network

Modern standards: ports of Austria are well developed and provide very good and modern infrastructure standards with sufficient capacity installed (huge investments in the last decades), even intermodal terminals with great capacities are installed

Trimodality: excellent modal split is developed; trimodality is state of the art in Austrian ports (rail-road-IWW); proximity and good connections to international airports (European regional hub Vienna).

Local traffic connections: ports have got very good external connections to regional road and railway network (each high level); competitiveness of inland waterway.

Transnational connections: very good connections to seaports in Europe in the north and west relations, also to black sea region and Adriatic seaports; in general Austrian has got a very great potential to direct connections in the middle section of the New Silk Road (one belt one road) in the eastern part of the country (new detailed plan just started recently) as well as the south section of this strategic corridor via the Danube axis.

Qualified staff: high level qualified logistic experts and workers of all levels are available in Austria; specialized education in this sector is provided.

Containerized business: well developed in the region (great affinity to containerized intercontinental business and logistic hubs for consumer goods).

Experience in demand-driven development: Austrian port sites have been developed over decades by "organic growing" in close connection with general business development & growing meaning that; so the ports have not been standalone elements of infrastructure but directly integrated in business circles.

Austrian Danube navigability: the river Danube is well maintained in Austria and performs with "higher upright phases" (low water problems, looks, …) compared to other riparian countries; high navigability rates over the whole year can be reached due many power stations (some small problematic zones east of Vienna).

via donau as successful waterway administration: this Austrian agency is one of the leading performers of European waterway companies facilitating improved navigational conditions on the Danube in Austria and helping other national waterway administrations to develop their activities of common interest.

4.3.1.2 Weaknesses

Low capacity utilization: low capacity utilization factors of installed waterside infrastructure; excess capacity for water-side transshipment is available and the port is facing a decreasing water cargo statistics in Austria; even the whole Danube in Austria is still used to a quite small rate compared to the river Rhine.

Capital intensity: high financial efforts for port investments in general and long payback rates for these huge investments; high financial thresholds for new investments and long capital binding periods lead to economic pressure.

Business models: business models for water transshipment are old and do not support todays dynamic demands of the relevant market and client needs; due to public ownership the ports are faced with relatively complex decision processes and supervising structures.

Lack of expansion space: expansion space is scarce and critical in most port areas.

Public economic situation: new great investments are a challenge according to actual economic and financial situation of public sector in general in Austria.

Railway infrastructure: cargo transport by rail has good growing rates compared to IWW (split and/or backup strategy of customers because of navigability problems) and requests for improvement of rail systems in ports – often problematically due to lack of needed corridors / lengths.

Railway bottlenecks in Austria: some critical points and bottlenecks in Austrian railway network led to additional cost (crossing the Alps – Phyrn Schober, Semmering, only one track to Koper, …).

Low investment capacities of vessel owners: vessel owners (as very important business partners of the ports) are under economic pressure, low financial power for new investments and modernization of equipment.

Small market sector: port business in general is a small market and acts in a narrow niche, few market partners, small competition – no boosting and booming market situation with intrinsic improvement and dynamic processes.

Insufficient lobbying for ports and IWT: lobbying for IWW business and ports is underdeveloped in Austria compared to rail or road (market shares of cargo transport and employment figures).

Dislocation of heavy industry: some of the Austrian heavy industries are far away from Danube (compared to Rhine region); broken transport is not favourable for water transport.

Insufficient strategic dimensions: port areas (including industrialized zones) have insufficient dimensions in relation to master planning items; new dedication of areas is very problematic

(neighbourhood, distances to others, special zones – Natura 2000, Seveso, …) – process industry as a huge mass driver needs great spaces.

Slow business development: port business is a sector with slow technological development, long modernization cycles, no dynamic intrinsic innovation and technology shifts – therefore only low level of market attractiveness.

4.3.1.3 Opportunities

Decarbonisation: urgent needs for decarbonisation and low carbon transport in general an especially for the transport sector (even NOx and fine particles) - due to recent climate change regulations in Europe and the whole world – IWT could be a substantial part of the future solution to this problem, new approaches and written targets in relevant papers (e.g. new governmental principle paper of Austria).

New markets: new markets and cargo for the future (biomass, building materials – huge market in Austria, high & heavy, fuels, renewables, recycling, cold ware, … specialized forms of contract logistics); shipping energy wood, pellets, chips, round wood from Austria to Germany can bring a substantial market in the upcoming years.

Eco-footprint philosophy: increasing (marketing) relevance of ecological footprint in business logistics (e.g. eco-labelling of consumer products) or end user demand will bring awareness to the whole transport chain and may bring up bottom up pressure to organizers of transport chains in order to switch to IWW; green logistics; change from industrial use of fossil fuels to renewables can bring further improvements and expansions of business specializations.

New city logistics: hubs for city logistics next to urban areas; distribution centers in combination with low emission / zero emission logistics and not available free spaces and transshipment areas in city regions (high prices will force alternatives).

Alternative fuels: ports are perfect areas for hubs and transshipment centers for modern fuels (alternative fuels, e-mobility, battery business, …).

Real estate industry: growing “immobility business” of the port companies itself (supra structure, leasing constructions, PPP, …).

E-commerce: online business has high growing rates and will influence the logistics of much more other goods in future; therefore, a new demand for logistic facilities with low distances to terminals and perfect battery limit infrastructures (roads, railway connections) and high-level core nodes (TEN-T); Danube ports “as pearls of a line” in tight settled areas may fulfil this demand quite well.

Physical internet: physical internet may lead to new production factories/systems where raw material supply plays an important role (and therefor new positioning of ports in future processes may come up).

Rail cargo attractiveness: rail-attracted business can be boosted in ports development due to existing basic infrastructure with block train options (e.g. for car cargo business).

Agricultural focus: agriculture and forestry are good economic sectors in Austria (including the second/third stage of value added) and may have dynamic future perspectives, including industrial settlement or development (e.g. biotech, feedstuff, …).

Regionalization of supply chains: supply chains may develop not only global in the future but even more to a regional level due to the actual approach in the direction of "supply chain agility", supported by continental and not intercontinental logistic processes; in this concept shorter logistic cycles could be much more relevant with my be better handled within the Danube ports.

One belt - one road: close connection of the Austria Danube to the New Silk Road, especially the middle range via railway connection to eastern part of Austria and southern part via Black Sea.

Containerization of cargo: container business will grow and bring new options for growing of Austrian ports which are still engaged in container business, even empty container management in Europe by IWW.

Short distance alternatives: search for alternatives for short distance transport (200-400 km) in order to reduce traffic on highways and rail lines (new water shuttle system development).

Modal split shift: modal split from road towards IWW can be supported by elimination negative effects on navigability on the Danube.

Infrastructure flexibility: creation of multipurpose transshipment infrastructure.

New industrial clusters: formation of special industrial clusters in the port hinterland leading to additional cargo.

4.3.1.4 Threats

Problems with Danube navigability: problems with navigability of Danube, supply chains may be interrupted for long parts of the year (especially due to problems outside of Austria) – frequently lead to loss of customers or cargo.

Stricter environmental regulations: laws will bring stricter regulations and more cost for ports (especially precipitation water and pre-treatment equipment – "water frame regulations").

Road & rail competition: strong competition of these two sectors, cargo shift towards road (cheap drivers) and rail (strong market pressure in combination with insufficient navigability performance).

Containerization of cargo: decreasing of break bulk economy in future years may lead to negative scenarios for IWW and transshipment figures; cargo in containers shows strong

growing rates and other types of cargo will go the way into the container if cost system can be optimized by this way (containers will not be processed on water)

Vessel owner community: vessel owners will not recover from economic low performing and will not be able to invest in modernization and innovation of their fleet equipment; no chance for modernized and environmental friendly engines with alternative fuels

Bureaucracy: too much bureaucracy for IWW in general (e.g. customs, no sense for "one river – one rule", …) lead to increasing cost and decreasing competitiveness of IWW and ports

Emigration of industry: relocation of heavy industry from (parts of) Europe to locations with cheaper production cost (energy regions of the world, sea coast regions, …)

Relations with the neighbourhood: problems with neighbourhood of ports, claims, complaints, … about noise or dust emission, much traffic, or other items (e.g. Natura 2000)

Outdated laws: great demands of owners of old rights (e.g. fishing law) may lead to very high cost for port business in general

Decentralized production: internet of things may lead to a development direction of decreasing cargo in general in the world; production may be done directly in the regions of population and cargo flow may dramatically change (central Europe is not a region with increasing population)

Public economy: public financial and economic systems are still under pressure in coming years and faced with needs of saving cost; very limited possibilities for fresh money to bring up new huge investments in the ports in general

Lack of skilled workforce: lack of workforce in several levels in Austria force industry and companies to go away and in consequence of this leads in general to decreasing cargo flow / transshipment in Austria

International (global) economy: international economic crises may bring systems in Europe under pressure and lead to depression scenarios with low cargo flows.

Overcapacity: overcapacity of specialized infrastructure (e.g. terminals for container) and relocation of industries to the hinterland; emigration of industry from Austria due to high cost

Rail bottlenecks: closure of freight terminal accessibility by rail.

5 Slovakia

5.1 Port of Bratislava SWOT Analysis

5.1.1 Introduction

Bratislava Port is the most important strategic port in Slovakia on the international Danube waterway. Currently it fulfils the functions of a universal cargo and passenger port. The port's potential is enhanced by its excellent geographical location at the crossroads of the Rhine – Danube and Baltic Sea – Adriatic Sea corridors of TEN-T transport networks and easy access to other European capitals and important ports in Vienna and Budapest.

Bratislava Port is a complex of water bodies, hydro technical installations, port pools and related infrastructure, facilities and storage areas served and connected to both rail and road transportation networks and infrastructure.

Verejné Prístavy, a.s. (hereinafter VP, a.s.) is not the owner of infrastructure and superstructure, therefore it is not possible to carry out the development activities as it is usual in other inland ports in the Danube Region. VP, a. s. as the owner and port manager at the same time cannot be developed due to the amount of long-term lease contracts that were concluded in the past. Current business relations represent a major brake on the development of public ports. The problem is, in particular, the non-standard division of ownership between VP, a. s., and Slovenská Plavba a Prístavy, a.s., which owns the infrastructure and superstructure on long-term leased property of VP, a.s.

The company Slovenská Plavba a Prístavy, a.s. (hereinafter SPaP, a.s.) is one of the main entities that leases a land from VP, a.s. The company SPaP, a.s. has leased 64% of available area until 2031 and is the majority cargo port operator in Bratislava. State professional supervision over the administration and maintenance of waterways and ports is carried out by the Transport Authority – inland navigation division. It also allows the berthing of floating facilities on waterways and in public ports.

Slovenský vodohospodársky podnik, š. p. (a state enterprise, hereinafter SVP, š. p.) is the administrator of waterway where both ports, Bratislava is situated.

The management and operation model of public ports in Slovakia under the VP 's management, is specific. It is approaching the so-called "Landlord model" of management (i.e. the lease of port areas, infrastructure and adjacent lands to potential managers or providers of port services in the field of water transport by public tender).

In view of the current situation when the ownership over infrastructure and superstructure (currently owned by SPaP, a.s.) is not solved, it is impossible to fully apply the "Landlord model" of port management in the public ports.

The vision of the company VP, a.s. is to apply so-called "Tool port" management model after the resolution of land ownership in the territories of public ports.

5.1.2 SWOT analysis

Table 4: SWOT matrix for the Port of Bratislava

Strengths	Weaknesses
• Good geographic location • The same market access conditions for all entities • Port charges are not the subject of competition, they are determined by the owner of a port after the approval of the Ministry of Transport and Construction of the Slovak Republic • Possibility of absorption of EU funds for development • Cleaning port from the long-term non used vessels will release aquatorium of port, allowing the overall development of ports. • The development and operation of modern technologies will lead to reduced operating and maintenance costs.	• Non-standard property relations in public ports • Current technical state of port infrastructure and superstructure • Port transhipping capacity insufficiently used • Impossibility to influence operator's transshipment performance • development of a port is determined by location in relation to the residential areas of agglomeration • Lower revenues from port fees as a result of "cleaning" the port from the long-term non-used vessels • It is necessary to obtain funds for the long-term development of the port
Opportunities	**Threats**
• Allocating of funds for the development of the Bratislava port within the Operational Programme 2014-2020 (hereinafter "OP II") • Possibility to cooperate with the private sector through Public Private Partnership projects (hereinafter "PPP projects") • Make trade negotiations with the current tenants and the owners of infrastructure and superstructure in the territories of public ports in Bratislava • Possibility of increasing the transshipment capacities without the need of port territory enlargement	• Existence of receivables overdue • Limited use of EU funds to develop public ports (due to non-standard property relations in ports) • Assets managed by VP, a.s. under the Act No. 338/2000 Coll. described as "Priority Investment Assets" • Port facilities and territories belong to entities of different nature that leads to the reluctance to invest in new facilities and infrastructure modernisation • High level of risk associated with the investments of private entities and obsolete equipment in ports that limits their competitiveness

(using the previously unused area owned by VP, a.s.) • Determination of minimum transshipment performance of operators in the Bratislava ports • Possibility to extend the portfolio of port services • Pro-active marketing will contribute to the gradual "visibility" of the public port.	• Business activities may be at risk without qualified personnel. • Competition from other ports • In the case of poor state support as a port manager, there may be a limitation of port technology innovation.

(Source: VPAS)

5.1.2.1 Strengths

Good geographic location - port od Bratislava has strategic geographic location. Close by there is a boarder with Austria and Hungary and it has excellent geographical location at the crossroads of the Rhine – Danube and Baltic Sea – Adriatic Sea corridors of TEN-T transport networks.

There are the same market access conditions for all entities. VP a.s. ensures that none of entities are being favoured.

Port charges are not the subject of competition, they are determined by the owner of a port after the approval of the Ministry of Transport and Construction of the Slovak Republic - it ensures the equal conditions for entities. Offered higher price of port charges do not prefer one entities before another.

There is possibility of absorption of EU funds for development. Port of Bratislava can be developed by EU funds resources. The company VP, a.s. does not have enough financial resources to secure development projects. One option how to obtain finance for development is the absorption of European Union structural funds, especially via the Integrated Infrastructure Operational Programme 2014-2020. PPP projects are also important in order to attract strategic investors.

Cleaning port from the long-term non-used vessels will release aquatorium of port, allowing the overall development of ports. Currently in the area of public port Bratislava there are vessels that are non-used and their berthing in the area of port affects the possibility of berthing of other vessels and the development of the port. By removing of these vessels from the port area the VP, a.s. could implement the development activities in these port areas.

The development and operation of modern technologies will lead to reduced operating and maintenance costs. By implementing the new technologies into port services there is a possibility to reduce maintenance costs of the old technologies.

5.1.2.2 Weaknesses

Non-standard property relations in public ports - The port manager of public ports was originally a national enterprise, then a state enterprise called Slovenská plavba dunajská, š.p. (a state-owned enterprise; hereinafter "SPD, š.p.). By delimitation of state property between ŠPS and SPD š.p., the joint-stock company Slovenská plavba a prístavy, a.s. (hereinafter SPaP, a.s.) was established in 1997 with more than 90% of the shares in the National Property Fund. The company SPaP, a.s. owned all the assets and acquired the ownership of the fleet, transfer facilities, warehouses, workshops, maintenance facilities, administrative buildings, as well as infrastructure (roads, private railway, unloading, engineering networks, quay walls in internal basins …) in the ports of Bratislava and Komárno. There are only private operators that provide port services (particularly SPaP, a.s.). Therefore, private operators have 100% of the shares of performance in the Slovak public ports.

Current technical state of port infrastructure and superstructure – Technical state of port infrastructure and superstructure is in the bad state. This point is related to the previous point. Due to this VP a.s. does not affect the recovery.

Port transhipping capacity insufficiently used - This point is related to the first point as well. VP, a.s. cannot increase use of transhipping capacity because of land ownership of SPaP, a.s.

Impossibility to influence operator's transshipment performance - This point is related to the first point as well. The company SPaP, a.s. has leased 64% of available area until 2031 and is the majority cargo port operator in Bratislava.

Development of a port is determined by location in relation to the residential areas of agglomeration – Port of Bratislava is situated among the residential areas. Therefore, the further development must be considered with regard to location.

Lower revenues from port fees as a result of "cleaning" the port from the long-term non-used vessels. In case of "cleaning" the port should start with the implementation of their development activities in these areas to reduce the effect of lower revenues and prepare the conditions for increasing revenues.

It is necessary to obtain funds for the long-term development of the port. The development of port is very expensive and for the development actions it is necessary to obtain funds.

5.1.2.3 Opportunities

Earmarking of funds for the development of the Bratislava port within the Operational Programme 2014-2020 (hereinafter "OP II") - Ministry of Transport and Construction of the Slovak Republic has included port od Bratislava among priorities of OPII. For VP, a.s. are these funds important source of finance.

Possibility to cooperate with the private sector through Public Private Partnership projects (hereinafter "PPP projects") - PPP projects are important in order to attract strategic investors.

Make trade negotiations with the current tenants and the owners of infrastructure and superstructure in the territories of public ports in Bratislava - it is important to make trade negotiations with the current tenants and the owners of infrastructure and superstructure in the territories of public ports in Bratislava. In the case of cancellation, the current leases relating to the land where the transshipment activities are currently carried out, or the transfer of infrastructure and superstructure to the management of public ports, the priority success factor No. 1 about public ownership of infrastructure and superstructure will be successfully fulfilled. The aim of negotiations should be an agreement of all participating parties. This agreement will lead to the conceptual development of the Bratislava public port. In a port where the public ownership is predominant, it is appropriate to implement the "Tool port" management model. The port manager owns, develops, operates and maintains the port infrastructure and superstructure (including transshipment equipment). The trustee company employs the staff who are necessary for operation, maintenance and development of the public port infrastructure and superstructure.

Possibility of increasing the transshipment capacities without the need of port territory enlargement (using the previously unused area owned by VP, a.s.) – There is unused area owned by VP, a.s., which creates an opportunity to develop port of Bratislava. This development will help VP, a.s. to improve economic situation without the need of port territory enlargement.

Determination of minimum transshipment performance of operators in the Bratislava ports – in the case of cancellation the current leases relating to the land where the transshipment activities are currently carried out, or the transfer of infrastructure and superstructure to the management of public ports, the priority success factor No. 1 about public ownership of infrastructure and superstructure will be successfully fulfilled. In a port where the public ownership is predominant, it is appropriate to implement the "Tool port" management model. After that is important determine of minimum transshipment performance of operators. A tool, by which the manager "pushes" the individual operators to the effective use of the quay wall, is the condition of the minimum annual amount of goods transhipped on one quay wall. Unless a predetermined volume of transshipment is reached, penalties are clearly defined (e.g. in the form of economic instruments laid down in agreements).

Possibility to extend the portfolio of port services – Port of Bratislava can offer amount of port services. The priority is make trade negotiations with the current tenants and the owners of infrastructure and superstructure, after that VP, a.s. can take a pattern of others project partners who are involved in Interreg.

Pro-active marketing will contribute to the gradual "visibility" of the public port. It is important to make the brand of Verejné prístavy, a.s. more visible what can in future increase the revenues of the company and make the port more competitive.

5.1.2.4 Threats

Existence of receivables overdue - non-recoverable receivables overdue from the previous periods should become, for the company VP, a.s., the sources of funding for the future port development activities. Therefore, it is important to oversee the reimbursement.

Limited use of EU funds to develop public ports (due to non-standard property relations in ports) – this threat can be eliminated by making trade negotiations with the current tenants and the owners.

Assets managed by VP, a.s. under the Act No. 338/2000 Coll. described as "Priority Investment Assets" - Among one of limitations stipulated by Act No. 500/2007 Coll. can be found the classification of VP's, a.s. land into the category of priority investment property, with regard to its location in the boundary area of the public ports. This restriction primarily relates to the limitations on the possible financing an investment event. The reason is that the priority investment property cannot be the subject of a lien.

Port facilities and territories belong to entities of different nature that leads to the reluctance to invest in new facilities and infrastructure modernisation – nevertheless entities have concluded long-term lease contracts, they do not invest in new facilities and infrastructure modernisation. Therefore, is important making trade negotiations with the current tenants and the owners and invest in our own.

A high level of risk associated with the investments of private entities and obsolete equipment in ports that limits their competitiveness – Port operator doesn´t invest in new facilities and infrastructure, therefore after making trade negotiations with the current tenants and the owners will be equipment in bad condition.

Business activities may be at risk without qualified personnel. Without the qualified personnel it is impossible to make business activities competitive with other companies or ports.

Competition from other ports. Ports of Vienna and of Budapest are implementing their development and business ideas so it is very important to be prepared to be competitive.

In the case of poor state support as a port manager, there may be a limitation of port technology innovation.

5.2 Port of Komarno SWOT analysis

5.2.1 Introduction

Komárno Port is the second most important port in Slovakia. The port is 100 km downriver from Bratislava Port. The port is also considered the terminus of the Váh inland waterway planned to connect Žilina with the Danube.

Komárno Port is located on the left-bank of the Danube between river kilometres 1,770.00 and 1,762.00. The port is divided into west and east sections. The port is partially located on the riverbank and in a shared pool used by the port and a shipbuilding facility. The port site is spread out over more than 20 hectares but is relatively narrow near the centre of town, residential neighbourhoods and the Komárno Fortifications national historical landmark at the confluence of the Danube and the Váh rivers in Komárno.

Komárno Port is a public port used for the transshipment of goods between rail, road and water transport directly or using temporary storage in port facilities. Conceptually, technologically and structurally, Komárno Port is built for the transshipment of bulk materials. The port can also be used to protect vessels in this section of the Danube and a portion of the Váh in emergencies (flooding, ice floes, high water conditions, etc.). In terms of passenger traffic, the port is primarily used in the summer months by pleasure craft in the open channel of the Danube.

Ownership situation of port of Komárno is similar like in port of Bratislava. SPaP a.s. is the main entity in this port. The same restrictions apply as in the port of Bratislava.

5.2.2 SWOT analysis

Table 5: SWOT matrix for the Port of Komarno

Strengths	Weaknesses
• Preservation of the strategic position of the port of Komárno on the Danube and Váh confluence. • Land for rent • The same market access conditions for all entities • Compliance with international conventions on the preservation of a port of international importance. • Port charges are not the subject of competition, they are determined by the owner of a port after the approval of the Ministry of Transport and Construction of the Slovak Republic • Possibility of absorption of EU funds for development	• Non-standard property relations in public ports • Current technical state of port infrastructure and superstructure • Port transhipping capacity insufficiently used

Opportunities	Threats
• Possibility to cooperate with the private sector through Public Private Partnership projects (hereinafter "PPP projects") • Make trade negotiations with the current tenants and the owners of infrastructure and superstructure in the territories of public ports in Komárno • possibility of increasing the transshipment capacities without the need of port territory enlargement (using the previously unused area owned by VP, a.s.) • Determination of minimum transshipment performance of operators in the Komárno port • Possibility to extend the portfolio of port services • In the case of relocation of the port to another locality, the release of the port of Komárno for the construction of public amenities	• Existence of receivables overdue • Limited use of EU funds to develop public ports (due to non-standard property relations in ports) • Assets managed by VP, a.s. under the Act No. 338/2000 Coll. described as "Priority Investment Assets" • Port facilities and territories belong to entities of different nature that leads to the reluctance to invest in new facilities and infrastructure modernisation • Competition from other ports and business companies located in port.

(Source: VPAS)

5.2.2.1 Strengths

Preservation of the strategic position of the port of Komárno on the Danube and Váh confluence - port of Komárno has strategic geographic location. Close by there is a boarder with Hungary and confluence of river Danube and Váh. Position of Komárno port designate it to a port with big strategic value for future.

Land for rent – VP, a.s. owns the land for rent, where a buildings and warehouses are. This area can be suitable for investors.

There are the same market access conditions for all entities. VP a.s. ensures that none of entities are being favoured.

Compliance with international conventions on the preservation of a port of international importance. Port of Komárno is the port of TEN-T and has an international importance in the conditions of European Union.

Port charges are not the subject of competition, they are determined by the owner of a port after the approval of the Ministry of Transport and Construction of the Slovak Republic - it ensures the equal conditions for entities. Offered higher price of port charges do not prefer one entities before another.

There is possibility of absorption of EU funds for development. Port of Komárno can be developed by means of EU funds. The company VP, a.s. does not have enough financial resources to secure development projects. One option how to obtain finance for development is the absorption of European Union structural funds, especially via the Integrated Infrastructure Operational Programme 2014-2020. PPP projects are also important to attract strategic investors.

5.2.2.2 Weaknesses

Non-standard property relations in public ports - The port manager of public ports was originally a national enterprise, then a state enterprise called Slovenská plavba dunajská, š.p. (a state-owned enterprise; hereinafter "SPD, š.p.). By delimitation of state property between ŠPS and SPD š.p., the joint-stock company Slovenská plavba a prístavy, a.s. (hereinafter SPaP, a.s.) was established in 1997 with more than 90% of the shares in the National Property Fund. The company SPaP, a.s. owned all the assets and acquired the ownership of the fleet, transfer facilities, warehouses, workshops, maintenance facilities, administrative buildings, as well as infrastructure (roads, private railway, unloading, engineering networks, quay walls in internal basins …) in the ports of Bratislava and Komárno. There are only private operators that provide port services (particularly SPaP, a.s.). Therefore, private operators have 100% of the shares of performance in the Slovak public ports.

Current technical state of port infrastructure and superstructure – Technical state of port infrastructure and superstructure is in the bad state. There are untreated quays, which are in contrast to Hungarian side.

Port transhipping capacity insufficiently used - This point is related to the first point. VP, a.s. cannot increase use of transhipping capacity because of land ownership of SPaP, a.s.

5.2.2.3 Opportunities

Possibility to cooperate with the private sector through Public Private Partnership projects (hereinafter "PPP projects") - PPP projects are important in order to attract strategic investors.

Make trade negotiations with the current tenants and the owners of infrastructure and superstructure in the territories of public ports in Komárno - it is important to make trade negotiations with the current tenants and the owners of infrastructure and superstructure in the territories of public ports in Komárno. In the case of cancellation, the current leases relating to the land where the transshipment activities are currently carried out, or the transfer of infrastructure and superstructure to the management of public ports, the priority

success factor No. 1 about public ownership of infrastructure and superstructure will be successfully fulfilled. The aim of negotiations should be an agreement of all participating parties. This agreement will lead to the conceptual development of the Komárno public port. In a port where the public ownership is predominant, it is appropriate to implement the "Tool port" management model. The port manager owns, develops, operates and maintains the port infrastructure and superstructure (including transshipment equipment). The trustee company employs the staff who are necessary for operation, maintenance and development of the public port infrastructure and superstructure.

Possibility of increasing the transshipment capacities without the need of port territory enlargement (using the previously unused area owned by VP, a.s.) – There is unused area owned by VP, a.s., which creates an opportunity to develop port of Komárno. This development will help VP, a.s. to improve economic situation without the need of port territory enlargement.

Determination of minimum transshipment performance of operators in the Komárno ports – in the case of cancellation the current leases relating to the land where the transshipment activities are currently carried out, or the transfer of infrastructure and superstructure to the management of public ports, the priority success factor No. 1 about public ownership of infrastructure and superstructure will be successfully fulfilled. In a port where the public ownership is predominant, it is appropriate to implement the "Tool port" management model. After that is important determine of minimum transshipment performance of operators. A tool, by which the manager "pushes" the individual operators to the effective use of the quay wall, is the condition of the minimum annual amount of goods transhipped on one quay wall. Unless a predetermined volume of transshipment is reached, penalties are clearly defined (e.g. in the form of economic instruments laid down in agreements).

Possibility to extend the portfolio of port services – Port of Komárno can offer amount of port services. The priority is make trade negotiations with the current tenants and the owners of infrastructure and superstructure, after that VP, a.s. can take a pattern of others project partners who are involved in Interreg.

In the case of relocation of the port to another locality, the release of the port of Komárno for the construction of public amenities.

5.2.2.4 Threats

Existence of receivables overdue - non-recoverable receivables overdue from the previous periods should become, for the company VP, a.s., the sources of funding for the future port development activities. Therefore, it is important to oversee the reimbursement.

Limited use of EU funds to develop public ports (due to non-standard property relations in ports) – this threat can be eliminated by making trade negotiations with the current tenants and the owners.

Assets managed by VP, a.s. under the Act No. 338/2000 Coll. described as "Priority Investment Assets" - Among one of limitations stipulated by Act No. 500/2007 Coll. can be found the classification of VP's, a.s. land into the category of priority investment property, regarding its location in the boundary area of the public ports. This restriction primarily relates to the limitations on the possible financing an investment event. The reason is that the priority investment property cannot be the subject of a lien.

Port facilities and territories belong to entities of different nature that leads to the reluctance to invest in new facilities and infrastructure modernisation – nevertheless entities have concluded long-term lease contracts, they do not invest in new facilities and infrastructure modernisation. Therefore, is important making trade negotiations with the current tenants and the owners and invest in our own.

Competition from other ports and business companies located in port.

5.3 Country-wide SWOT analysis of the Slovak port industry

Table 6: SWOT matrix for the port industry in Slovakia

Strengths	Weaknesses
• Strategic geographic location in relation to the location of potential customers' connection to a network of inland waterways of international importance • Shipping costs • Supporting the development of water transport by the European Union	• Long transport times in water transport low transport capacities of an existing fleet • Weak awareness of the possibilities of use of water transport by logistics operators in Slovakia need for multiple transhipment
Opportunities	**Threats**
• Growing trend in logistics and international goods transport • Increase production of cars and consumer goods in Slovakia • Orientation of the economy of the SR mainly on export	• The direct competition of rail transport • Dependence of the use of water transport on weather and hydrological conditions • Increased use of rail and road transport • the development of Port of Koper as the main logistic hub for Slovak car factories in maritime transport

(Source: VPAS)

5.3.1.1 Strengths

Strategic geographic location in relation to the location of potential customers can positively influence the port industry by creating new opportunities in transhipment and transport.

Connection to a network of inland waterways of international importance affects the industry of ports by creating possibilities to transport goods and passengers on different waterways.

Shipping costs in water transport are cheaper than costs of other modes of transport. In this point of view in the port industry is more costs effective for using water transport than rail or road transport.

Supporting the development of water transport by the European Union. On the basis of the support of European Union and creating conditions for eliminate CO2 and establishing of conditions for environmental friendly transport is the industry of ports the most supported field of industry and transport.

5.3.1.2 Weaknesses

Long transport times in water transport could negatively affect the water transport and port industry. The rail and road transport are more time-effective.

Currently the existing fleet of vessels in Slovakia is providing low transport capacities.

Slovak logistics companies are using more road and rail mode of transport than water transport. It is important to make the water transport awareness.

Multiple transhipments are required in order to increase the use of inland waterway transportation (IWT).

5.3.1.3 Opportunities

Demand for Transport and logistics of goods is growing and this is the possibility to develop the water transport and port industry.

Slovakia is one of the world leading countries in car production. This is the opportunity to use the port industry in the transport of the cars.

5.3.1.4 Threats

The port industry and water transport are in the direct competition to rail and road transport. Currently the rail and road transport are more used.

Weather and hydrological conditions can negatively affect the use of water transport. In case of ice in the river stream or a low depth of the river it is impossible to use the water transport.

6 Hungary

6.1 Port of Budapest (Ferroport Ltd.) SWOT Analysis

6.1.1 Introduction

Ferroport Ltd. was established in 1988, primarily for storing iron and steel products. Since then the main business is still shipping and storing these goods. During the years our services was widened with handling of agrarian goods, aluminium, scrap steel and fertilizer.

Ferroport Ltd. belongs to the German company M. Preymesser GmbH since 2006. No. of employees: aprox. 40.

Services:

- The company has an area of a 4,7 acre, with a warehouse of 9.000 m2, where several cranes are installed. There is additionally a 3000 m2, 12.500 ton capacity covered flat storage area split to 5 parts, for storage of bulk products.
- In the 9.000m2 big warehouse we store mainly iron and steel products, but thanks to the connecting roof, which ensures the covered transshipment of ships, they also do there the great majority of the grain transshipment.
- On the open storage area, they store the goods which are not sensitive to weather, just like scrap steel, aluminum, or steel construction parts.
- Within the confines of their services they offer transshipment of products coming on road, rail or waterway, no matter if it is bundled or bulk goods.
- A new offer of their services is to fill bulk fertilizer into Big-Bags.
- With their cranes on the quay they can load 3 ships at the same time.
- Loading capacity of the port is approx. 4000 tons/day.
- Ferroport Ltd. offers also bonded warehousing.

Berth: Ferroport Ltd. is to be found on the left bank of the Danube, at the 1639,75 km-post, in the 1st basin of Freeport Csepel, right on the right side of port entry.

The total quay length available in the port reaches ca. 270 m distributed over 3 operating terminals. Ports loading capacity can reach 1.000.000 tons/year, while the average annual turnover is around 600.000 tons/year.

Figure 4: Ferroport Budapest

(Source: Ferroport Ltd.)

6.1.2 SWOT analysis

Table 7: SWOT matrix for the Port of Budapest (Ferroport Ltd.)

Strengths	Weaknesses
• Possibility of covered loading • Tug boat service • Large warehouse capacity, also bonded warehousing • A member of a large international group of companies	• No vertical quay
Opportunities	**Threats**
• A technology that delivers bulk goods out of the warehouse through a closed system (the back covered warehouse is currently not connected to the vessel) • Road network, railway network, further development	• There are a couple of harbours in the area with whom they compete (primarily price competition) - all of them have similar characteristics (loading, storing) • Over-supply of distorted market capacity caused by excessive investment subsidies

(Source: HFIP)

6.1.2.1 Strengths

There is no covered loader in Hungary elsewhere, only in Budapest, which means that Ferroport Ltd. has an advantage that here cargo can be loaded regardless of the weather. The port also provides tug boat service, which exist only at Dunaújváros. Ferroport is a member of an international group of companies (Germany, Hungary, Romania, Austria) which means good contacts to bring good market-opportunities.

6.1.2.2 Weaknesses

It can be highlighted as a weakness regarding Ferroport that they do not have any vertical quays at the port.

6.1.2.3 Opportunities

A development area, and therefore is an opportunity to apply a technology that delivers bulk goods out of the warehouse through a closed system (e.g. high conveyor) - the back covered warehouse is currently not connected to the vessel. Another opportunity for the port is the further development of road and railway network.

6.1.2.4 Threats

There are several of competing ports in the area (primarily price competition), and all of them have similar characteristics (loading, storing). There is over-supply of distorted market capacity caused by excessive investment subsidies.

6.2 Port of Baja SWOT analysis

6.2.1 Introduction

The mission of Baja Public Port is to become the driving force of the Southern-Hungarian border region of the EU not only by promoting waterway and multi-modal transport, but also by creating a liveable socio-economic centre with special attention to the environment – social, economic and natural – and by providing and promoting recreational facilities.

Baja Public Port is the second most important Hungarian port of the Main-Rhine-Danube waterway system. Baja has a centuries-old tradition of shipping and port operation. It played a distinguished role as a transit station in the trade directed at the Far-East. The completion of the Danube-Main Channel resulted in intensified traffic from the South to the North, with ships under German, Belgian and Dutch flags sailing the Danube in increased numbers again, while the Balkan War temporarily disabled southbound traffic completely. Baja – by virtue of its geographical location on the Danube – is directly connected to the world, be it West or East, along the waterways.

The town of Baja is the most important traffic junction of the region and of Southern Hungary. Due to its location and the proximity of three countries' borders Baja can become the logistics centre of the region. In 1992 the Government declared the Port of Baja a National Public Port. This means that from that date onwards the State has guaranteed the operation of the port. In 1999 a company was founded to operate the Port on an area extending over almost 21

hectares. Its main task ever since has been to ensure the best possible standard of service according to national and international norms.

The declared aim of Baja Public Port has been to manage the assets entrusted to it by the State in the most profitable way and to become a moving force in the development of not only the town, but also of the whole region. By offering an all-round logistics service and a more cost-efficient transport possibility, it enhances the opportunities and chances for success for local trade and industry, as well as enterprises planning to settle here.

Services:

- all kind of port and logistic services
- loading/unloading ships, barges, trains, trucks (all kind of goods, except hazardous goods)
- loading/unloading special sized and weighted goods,
- warehousing, storing
- bonded warehousing, (for bulk goods as well)
- ware receipt giving
- container handling, repairing and depot
- all kind of customs services, customs clearance
- transporting (road, rail, waterway, container, Ro-Ro)
- packing of goods
- foreign trade,
- customs entry point,
- office for veterinary and plant health inspection and control,
- Ro-Ro services (ramp, parking),
- electricity and drink water supply
- bilge water and waste unloading facility

Berth: The Port of Baja is to be found on the left bank of the Danube between 1479+140 and 1480+900 km-posts.

Quay length, vertical: 1380 m, vertical 444 m

Number of terminals: 9 terminals

Loading capacity: 2 000 000 tons/year

Average annual turnover: 800 000 tons/year.

Figure 5: Port of Baja

(Source: Baja Public Port Ltd.)

6.2.2 SWOT analysis

Table 8: SWOT matrix for the Port of Baja

Strengths	Weaknesses
• Geographical location for export of agricultural products is very good • From this port the lowest cost to the Constanta seaport is the river freight • Green point: handling of bilge water and waste (contaminated substances) • Complex service (eg. customs, document filling) • Ro-Ro terminal (in Hungary only in Győr, Budapest and Baja) • Suitable for handling almost all types of cargo	• Road and rail connections are cumbersome • because of the ownership structure it is a bit inflexible, slow decision making • In the case of floods, the port is under water and cannot operate, also the goods in the warehouse are at risk in that case • no covered loader • Seasonality (mainly grain cargo) • no modern equipment suitable for container loading (in case of traffic)

• Supporting port development is in a favourable position due to the "National Public Port" status	• In very low water conditions there are loading problems • Lack of cargo handling time guaranteed • Lack of backbone (low rate of loading of goods outside cereals) • Lack of direct motorway connection
Opportunities	**Threats**
• Development of road-rail connections • Spatial development and expansion - establishing a new harbour bay (new storage, higher capacity) • Using Ro-Ro Terminal (currently not working) • Construction of a covered loader (but it may not be profitable) • Designing modern equipment for handling container traffic • Free loading capacity	• Poor labour supply, generation change (for companies operating in the port area) • Flood or water level strongly influences the operation • Setting up 2 quays for commercial purposes in Mohács • Danube Bridge built in Kalocsa

(Source: HFIP)

6.2.2.1 Strengths

The geographical location of Port of Baja is very good for export of agricultural products which is the main profile of the port. It is also a great asset, that the river freight cost to the seaport in Constanta is the lowest from this port. The port provides complex services, including for instance customs and filling of documents. Strength of the port that it is suitable for handling almost all types of cargo, and even has a Ro-Ro terminal which exist only in Győr, Budapest and Baja in Hungary. Port of Baja has a "National Public Port" status, which means that supporting the development of the port is in a favourable position. Another asset, that Baja operates as green point, and able to handle bilge water and waste.

6.2.2.2 Weaknesses

Although the port is trimodal, the road and rail connections are cumbersome and could be developed, also direct motorway connection is missing. Seasonality determine the operation of the port, as mainly grain cargo is handled there. There is only a low rate of loading goods outside cereals. Also, the weather conditions could cause problems in the operation: in case of floods, the port is under water and cannot operate, also the goods in the warehouse are at risk in that case. In very low water conditions, there are loading problems, therefore the cargo

handling time cannot be guaranteed. The port has no covered loader, and no modern equipment suitable for container loading. From the management point of view, decision making at the port is quite slow, because of the ownership structure. Therefore, this port is a bit inflexible.

6.2.2.3 Opportunities

One of the most obvious opportunities for the is the development of road-rail connections to increase the availability which is very important for the customers. Also, spatial development - establishing a new harbour bay (new storage, higher capacity) could increase the traffic at the port. Although the port has a Ro-Ro terminal, it is currently not working. Therefore, increasing the ro-ro traffic would be another development opportunity. Construction of a covered loader can be a further option; however, it may not be profitable. Designing modern equipment for handling containers could generate container traffic which is focused now only in Budapest. The port could also take the opportunity to utilize their free loading capacity.

6.2.2.4 Threats

It is a general phenomenon in Hungary, so is at Baja, that poor labour supply threatens the generation change at the companies operating in the port area, and it is very challenging to find qualified port professionals for the future operation. Flood or water level means another threat for the port, as these conditions have strong influence on the port operation. From the competition point of view: the on-going development in Mohács, where now they are setting up two quays for commercial purposes is a threat because they can part of the traffic. Also, the Danube bridge built in Kalocsa can be a potential threat as it could take some of the traffic from the port.

6.3 Port of Dunaújváros (Centroport Ltd.) SWOT analysis

6.3.1 Introduction

Centroport was Established in 1999. Works completed in February 2000 with total cost of HUF 300.000.000 that is 1.000.000 EUR without any kind of aid.

Stake in the enterprise of Port-Grain Ltd. 51 %

Stake of “others”: GLENCORE Netherlands B.V. 49 %

No of employees: 4

Activity: agro-logistic river/rail/road, transhipments, covered /1600 sqm/ flat grain storage at Dunaújváros.

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

There are several elements in the loading technology here which are unique in Hungary – and perhaps in Europe. For instance, a special feature is that – as appeared to the former techniques – the ship does not need to be shifted, a bridge structure is moving on the wharf

parallel to the ship and load the holds continuously. Loading rate 200 mto phrs, for shipping is 3.000 mto pwwd shinc, which is 1.000 mto per shifts. And on the top of all, in the end it prints a verified scales ticket about the weight of goods. The efficiency of solutions is well shown by the fact at present delivery is possible by road even if it is raining.

The technical capacity offered by Centroport is 300.000 mto yearly, handling about 10% of the total Hungarian grain export in better times.

On the right Danube bank at 1580-1579 fkm in a small bay, on the Szalki-island.

Length of vertical quay at No.6 abt. 120 m

Number of terminals: One terminal in operation

Loading capacity: 300.000 mto/year

Average annual turnover: 153.000 mto/year.

Figure 6: Port of Dunaújváros

(Source: Centroport Ltd.)

6.3.2 SWOT analysis

Table 9: SWOT matrix for the Port of Dunaújváros (Centroport Ltd.)

Strengths	Weaknesses
• Logistically favourable location • Good public and railway accessibility • Modern technology (flow chart, PLC control, etc.) • Storage depot system (30-40%) • Small staff • Flexible working time management • Stable, accustomed, experienced employees • Guaranteed loading standards • Tug boat service • Loading at the lowest and highest water level is also carefree and sustainable • Independent storage	• Dredging required • Limited access to railway due to missing railway track • Seasonality (hectic traffic but fix personnel costs) • Sensitivity to weather • Relative shortness of the available quay (90m) in case of congestion • Two internationally significant isoglucose and ethanol factories within 30 km of the harbour
Opportunities	**Threats**
• Building a railroad bypass on the siding • Putting a rail discharger system into operation • Usage of flowing balance as official railway weighing instrument • Equipment for discharge vessels/barges (e.g. mobile material handling machine – crawler/wheel) • Training of young people • Construction of a covered loader	• The proximity of Port of Adony with great bulk grain storage capacity • Challenges in finding the next generation in the management and technology

(Source: HFIP)

6.3.2.1 Strengths

Ple Centroport Ltd. (in Dunaújváros) has a logistically very favourable location, at the almost geometric middle of the country which means good public and railway accessibility (highway, main road, railway lines). The port applies modern technology, for example flowing balance and PLC control. Also, 30-40% of the stock can be removed from the storage depot system by

built in transverse hopper chain conveyor, which option is rare in Hungarian cereal stores. Small staff means that managing, executing, documenting, trading records, billing of daily work (16 o), and all other ancillary activities are executed by 4 employees (plus 1 person leased). The port operates with flexible working time management and able to handle irregular customer orders. The port has stable, loyal and experienced employees and offers guaranteed loading standards for the customers. Also, tug boat service is available at Centroport which exists is only in Dunaújváros and Budapest in Hungary. Strength of the port that it can operate smoothly even in the events of floods; loading at the lowest and highest water level is also carefree and sustainable. Another strength is that the port has an independent storage and can store cargo for three ships (covered storage, covered loading hopper chain conveyor).

6.3.2.2 Weaknesses

One of the weaknesses of the port is the need of regular dredging, which can cost € 65K a year. There is a railway track missing which would enable the port loading/unloading to rail in full value. The seasonality (hectic traffic, hectic quantity of tasks) can be mentioned as weakness at most of the ports in Hungary, people need to be constantly employed; therefore, during the period of weak commodity traffic personnel costs are relatively high. Another weakness, which can also be mentioned at most of the ports in Hungary, is the sensitivity to weather. Centroport cannot load ships in case of rain or snow. The quay is relatively short (90m), and the 100-115m self-propelled vessels are becoming more frequent, sometimes causing loading difficulties or causing failure. Within 30 km of the harbour, there are two internationally significant factories (isoglucose and ethanol) which absorb the maize production at a logistically acceptable supply distance (about 2,000,000 / year), which is perhaps the most significant export base bulk agricultural product, and thus the port loose a significant volume of orders.

6.3.2.3 Opportunities

By building a railroad bypass on the siding, the port could utilize their railroad technology with very good features proven in practice. If this was accomplished, with a smaller investment, also a rail removal system could be put into operation. The flowing balance, which was also mentioned among the strengths, once has already been accepted by Hungarian National Railways (MÁV) as official railway weighing instrument. It is also an opportunity for the port to establish equipment for discharge vessels/barges (e.g. mobile material handling machine – crawler/wheel). Lack of qualified port-professionals is a general problem in Hungary. For Centroport, training of young people is an opportunity to find their future employees and port managers. Another option for the future is the construction of a covered loader, because it can be found only in Budapest in Hungary.

6.3.2.4 Threats

One of the relevant threats for Centroport is the proximity of Port of Adony, which could take a part of the traffic. Adony has 500,000 tons of bulk grain storage capacity with three ship positions, meaning 600-700 tons/hour with total loading capacity. Lack of qualified port-

professionals on the labour market is a challenge for most Hungarian ports, including Centroport. The next generation must be found in the management and in the technology, but only a few suitable people are available.

6.4 Port of Győr-Gönyű SWOT analysis

6.4.1 Introduction

Győr-Gönyű National Public Harbour is the greatest intermodal logistic centre of the West Transdanubian region providing possibilities of cargo transportation by river, road, rail and air.

The aim of the company is to provide full services to our current and potential clients in the fields of cargo loading, storage and transportation.

The infrastructure of the harbour is developed in the spirit of a sustainable environment conscious development. The company operates in accordance with the requirements of quality management system standard MSZ EN ISO 9001:2009 during all service provision and developments.

Highlighted attention is paid to the protection of the natural environment and therefore all activities are performed by using an integrated environment-oriented management system pursuant to Standard MSZ EN ISO 14001:2005. We are committed to quality, efficiency and environment protection.

The harbour is situated on 110 hectares at river kilometre 1,794.00 of Danube, in the mouth of Danube of Moson, at the junction of several national transit railways of highlighted importance and motorways. The harbour is directly connected to European Highway E60 leading from Brest to Constanta, and to Highway System E75 Helsinki-Athens and Ystad-Rijeka. The harbour is the first gate and last station on a joint waterway leading to Europe. Győr-Gönyű Kikötő Zrt. has been operating and providing services to its customers since 1992. The initial three objectives – planning, investing and operating – are still valid via continuous scheduled developments built on each other. The owners have been unchanged almost since the foundation, and the shareholders include local governments concerned - Local Government of Győr-Moson-Sopron County, Győr City of County Rank and Gönyű Settlement - as well as Hungarian and Austrian special investors ordering their services. 60% of the shares are held by Hungarian owners.
Services:

- loading/unloading ships, barges, trains, trucks (all kind of goods such as rapeseed, soya, wheat, artificial fertilizers, iron rings, steel rolls, maize oil, linseed oil, ethyl alcohol, fuel oil, gas oil etc.)
- loading/unloading special sized and weighted goods (sails, trunks, power plant generators, iron sections etc.)
- Ro-Ro services (loading and unloading of trucks, cars and other special vehicles and roll stocks to and from ships)

- warehousing, storing (roofed storage in closed spaces as well as outdoor storage)
- electricity and drink water supply
- renting of harbour areas (for routine exercising of cars, for holding events etc.).

Berth: The harbour is situated on the area of Győr-Gönyű, between right bank sections 1+620-1+140 and 0+310-0+010 river kilometres of Danube of Moson emptying into Danube at right bank section 1893.9 river kilometres.

Quay length: 690 fm

Number of terminals: 4 terminals

Loading capacity: 500 000 ton/year

Average annual turnover: 300 000 tons/year.

Figure 7: Port of Győr-Gönyű

(Source: Győr-Gönyű Kikötő Zrt.)

6.4.2 SWOT analysis

Table 10: SWOT matrix for the Port of Győr-Gönyű

Strengths	Weaknesses
• Located in the meeting of several national transits of high priority railway line and the main line of the expressway network • Ro-Ro terminal • There are two major manufacturing companies in the port area (industrial activity) • Modern road and rail connections (new) • Green point • Modern service, high performance loading machines	• Need for dredging: the entrance and navigational channel should be dredged regularly • Lack of a market-oriented port operator
Opportunities	**Threats**
• Construction of a lock and passage canal that eliminates the need for dredging • Increase ro-ro traffic • Utilize the land with good infrastructures for development	• Komárom harbour development can divert traffic from the port

(Source: HFIP)

6.4.2.1 Strengths

The port is located in the meeting of several national transits of high priority railway line and the main line of the expressway network which is a great strength concerning the availability, as well as the modern road and rail connections. Győr-Gönyű is one of the ports in Hungary which has a Ro-Ro terminal, and it has modern service and high-performance loading machines. All of these enables the port providing wider range of services and higher quality. It is also an asset, that there are two major manufacturing companies in the port area which ensures industrial activity. Győr-Gönyű is a green point which can also be considered as a strength.

6.4.2.2 Weaknesses

P Among the weaknesses, need for dredging can be mentioned: the entrance and navigational channel should be swept regularly which generates extra operational costs. It also influences the efficient operation, that a market-oriented port operator is missing from the port.

6.4.2.3 Opportunities

One opportunity for Győr-Gönyű is to construct a lock and passage canal which would eliminate the need for dredging. Although the port has a Ro-Ro terminal, the Ro-Ro traffic could be increased. As the port has land with good infrastructure where further development could be carried out, utilization of these areas can also be considered as opportunity.

6.4.2.4 Threats

Main threat for Győr-Gönyű is the on-going harbour development in Komárom, which could divert traffic from the port.

6.5 Country-wide SWOT analysis of the Hungarian port industry

Please summarize the aspects of strengths, weaknesses, opportunities and threats which are more related to the national level, rather than to the local, port level.

Table 11: SWOT matrix for the port industry in Hungary

Strengths	Weaknesses
• Good and guaranteed loading and unloading standards • Regular service outside of working time (more flexible than in the western countries) • The geographic location of the ports is logistically mostly favourable • The majority of ports are trimodal • Modern technologies and high capacity loader machines • Small staff • General terms and conditions	• Road and rail links are cumbersome in most cases • The amount of loadable goods depends on the water level of the Danube; in very low water conditions there are loading problems • There is a limited number of sheltered loads • No equipment suitable for container loading (only in Budapest) • Need of dredging (some ports are not affected) • Decisive role of price

Opportunities	Threats
• EU resources are available for port infrastructure development in Hungary • Increase storage capacity • Introduction of businesses/industries into ports • Development of road-rail connections • Construction of covered loaders • Designing modern equipment for handling container traffic • Training of port professionals, training of labour force suitable for any port • Taking advantage of free loading capacity • Improving shipping conditions (Danube waterway)	• Lack of labour supply • Clients can avoid water transport due to uncertain water levels, and may change to road / rail transport modes • Development of road infrastructure (roads, bridges) near the ports can divert part of the traffic

(Source: HFIP)

6.5.1.1 Strengths

One of the strengths of the Hungarian ports is that they have good and guaranteed loading and unloading standards which guarantees a certain service level to their customers. Also, most Hungarian ports provide regular service outside of working time and are more flexible than the Danube ports in the western countries, for example in Austria or Germany. Logistically favourable geographic location typical at the majority of Hungarian ports, and can be mentioned as a strength, also the majority of Hungarian ports have connection to rail and road. Most ports apply modern technologies and high capacity loader machines which makes them competitive on the market, and most ports can operate with small staff, which means a strength from economical point of view. The general terms and conditions (established by HFIP in 2015) which applies to transactions between companies (port operators and clients) can also be mentioned among the strengths.

6.5.1.2 Weaknesses

Although most ports are trimodal, the road and rail links are cumbersome in many cases, which is a weakness and an opportunity for development. Most of the Hungarian ports' operation is influenced by the water level of the Danube, which determines the amount of loadable goods; in very low water conditions there are loading problems in many cases. It is also a weakness of the Hungarian ports, that there are limited possibilities of covered loading, so they cannot load vessels in rain or snow; covered loader only exists in Budapest. Lack of equipment and technology suitable for container loading is also representative at the Hungarian ports, therefore, only Port of Budapest has container traffic. Generally speaking, it

is a weakness that most ports need regular dredging which means increased operational costs, however some ports are not affected. Typical weakness at the Hungarian market, that the customers take high importance on the price of the services, and there is a significant price competition among the ports.

6.5.1.3 Opportunities

One of the most significant opportunities for ports in Hungary, that EU funds are available for port infrastructure development. Ports could be also developed by increasing their storage capacity, however they should take the market demand into consideration. Another opportunity is to settle industrial companies into the ports which could generate a regular and balanced level of cargo. In most cases there is a need for development of the road-rail connections, which would be a great opportunity to increase the traffic at the ports, as well as construction of covered loaders or designing modern equipment for handling container traffic. From the human resource point of view, there is a great opportunity in training of port professionals as there are not many relevant potential employees or port managers in the labour market. Also, an opportunity to consider is taking advantage of free loading capacities. The Hungarian Federation of Danube Ports in cooperation with The University of Dunaújváros has already established a training course for port professionals, which could help in qualifying a labour force suitable for any ports. Construction of a sluice and passage channel that eliminates the need for dredging could be a great help for most of the ports. Last but not least, the improvement of shipping conditions on the Danube needs to be mentioned among the opportunities as it would provide better conditions for operation at all Hungarian ports.

6.5.1.4 Threats

One of the main threats concerning the Hungarian ports is the lack of labour supply, and therefore the challenge of finding suitable people in the labour market for companies operating in the port area. However, there are already some solutions (e.g. port operator training established by HFIP) which could help solving the human resource problem on a long term. Further threats are related to the competition, especially with different transport modes: clients can avoid water transport due to uncertain water levels, and may change to road / rail transport modes, also, development of road infrastructure (roads, bridges) near the ports can divert part of the traffic.

7 Croatia

7.1 Port of Vukovar SWOT Analysis

7.1.1 Introduction

Danube River in Croatia is 137.5 rkm long. Port of Vukovar is the only cargo port in Croatia and it is situated on 1335+000 rkm of the Danube River which is Pan European corridor VII and it is part of the Rhine-Danube Core Network Corridor. Vukovar The port Vukovar Port is accessible during the entire year regardless of the water level.

The entire port was destroyed during the Homeland war. The port was not operational between 1991-1997. It was opened again in 1998.

Port of Vukovar is connected to the cities of Županja, Vinkovci and Brčko (Bosnia and Herzegovina) via M55 road. The same road connects it to the highway E-75 connecting Zagreb and Belgrade (Republic of Serbia). It is connected with road M2 with city of Osijek and with corridor VC (Budapest-Osijek-Sarajevo-Ploče).

Total port area of Vukovar Port is around 26 ha with no space for the further development. The railway infrastructure modernization and electrification project is in progress and it will reduce the existing port area for approximately 5,8 ha.

Port of Vukovar is an open shore type port with no port basins. It has a maximum draft of 2,6 meters and a cargo handling capacity of 2 mil. tons per year. There are no capacities for container handling in the port at this moment. There are capacities for high and heavy and out-of-gauge cargoes.

Length of the quay is 1,700 m: 260 m is a vertical quay, 1,000 m sloped quay and 400 m of quay is undeveloped. Port has 3 road entrances with 6 lanes. Total length of quay side railway track is 800 m, total length of the railway tracks is 3000 m.

Capacity of the storage is 13,000 m^2 for dry bulk and general cargo and 10,000 m^3 for liquid cargo. Bunker supply is provided in the bunker area. The port has facilities for ship-generated waste as well as for the used oil but this equipment is not in operation now.

The New port of Vukovar project encompasses the construction of infrastructural port facilities, vertical bank, road and railway, communal infrastructure, port loading and unloading equipment as well as construction of administration building. At this moment project is under suspension.

Vukovar Port is managed by the Vukovar Port Authority – public institution founded by the Republic of Croatia and in charge for management and development of port, port infrastructure building and maintaining, concessions for port services granting. Land in the Port is mostly State owned but there are still some parts owned by the private entities. Port

area is planned to be increased. Development plans are part of the national strategic documents and a Mid-term Development Plan which is under preparation.

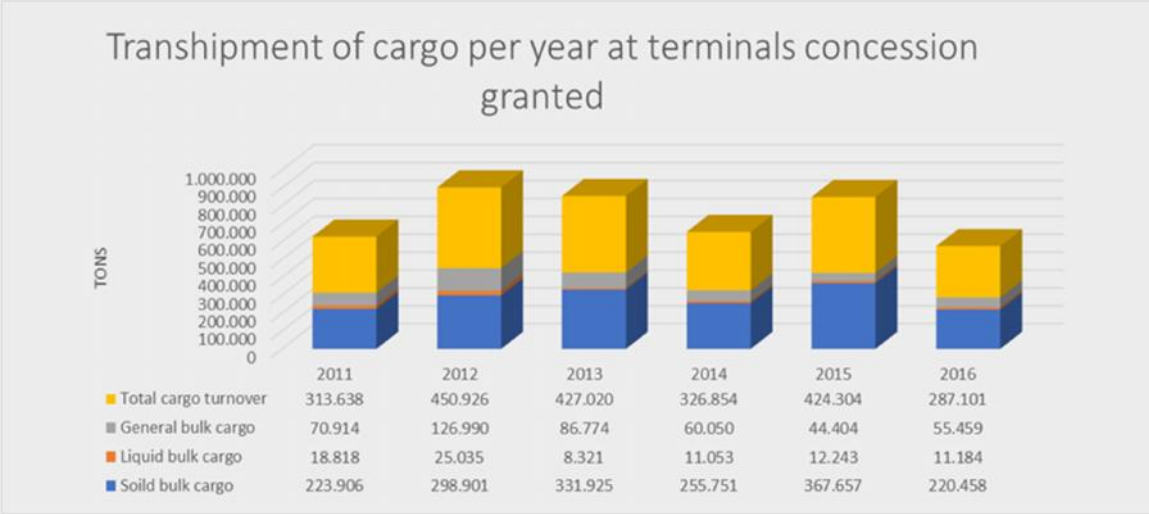

Figure 8: Transshipment in the Port of Vukovar

(Source: Port Authority of Vukovar – PAV)

7.1.2 SWOT analysis

Table 12: SWOT matrix for the Port of Vukovar

Strengths	Weaknesses
• State interest – investment and management guarantee • State interest protection by port authority – public service activitites defined by the law • Port management – one body port authority • Port area – mostly state owned • Public port accessibility for all users under same conditions • Continuity of port services guaranteed • Long term experience of port services providing • Marketing activities improvement • EU projects experience	• Lack of port capacities • Lack of the vertical quay • Limited space of the port area which is also in the process of decreasing • Various owners of the land within the port area • Lack of financial means for buying off the land • Long periods of realization • Lack of strategic mid-term development plans • Part of the port area – land together with infrastructure privately owned • The entrance to the port is not adjusted – it is difficult to manage the port traffic

• Educated staff of port authority	• Lack of long term agreements between port operators and port users
Opportunities	**Threats**
• Good position of port on the Danube • Navigability during the whole year • Accessibility - good connectivity with main road corridors and railway connection • Favorable geographical location on European transport corridor VII • Establishing the port area as 100% state owned and managed • Legal rules flexibility improvement in order to enable better market adjustments for port operators • Finding new financial investments opportunities (public-private partnership, EU funds) • Building new capacities in accordance with market demands • Designating the railway (subject of the future railway modernization project) for industrial purposes and returning this part into port area • Regulation of the port bank • Preparation of quality strategic and concession plans for port • Marketing activities improvement	• No stabile market and traffic for port operators – insecurity • Costs of buying off the land • Long expropriation procedures (when the owner refuses to sell his land) • Project Canal Danube – Sava – realization uncertainty – reflects directly on port development plans • Project Canal Danube – Sava – possibility of goods decrease and current Port location change • Railway – passenger traffic – instead of port development • Low quality of development plans which directly reflects on possibility for EU funds applying • Not fulfilling obligation of concession agreements by the operators in the sense of cargo amounts and investment plans • Old equipment of port operators and obsolescence of technologies • Long procedure for port area expanding

(Source: Port Authority of Vukovar - PAV)

7.1.2.1 Strengths

Vukovar Port is a port of an interest for the Republic of Croatia, which represents a guarantee for the State funded capital investments. Public service activities are defined by the Act on Inland Navigation and Inland Ports ("Official Gazette" no 109/07, 132/07, 51/13, 152/14) and by those, public interest is protected and done by the port authorities and supervised by the Ministry for the Sea, Transport and Infrastructure. Port is managed by the Port Authority only. Land within the port area is mostly owned by the State and managed by the Port Authority (it

is recorded in the land register). AINIP guarantees port accessibility for all users under same conditions and continuity of port services. Most of the port operators have a long time experience in port services and good connections and cooperation with users. Port Authortiy Vukovar has young and highly educated staff/employees and experience in EU projects management.

7.1.2.2 Weaknesses

Port capacities are not sufficient; there is especially lack of the storage capacities. There should be foreseen also the capacities - land and equipment - for the waste collection and management Vertical quay is not long enough and needs extension in order to improve port services. Port area is in the process of decreasing for around 5,8 ha due to railway modernization and electrification project of a State interest. Railway project is going to divide port in two parts which implies a traffic communication limitations and other restrictions.

Different owners own Land within the port area, it is mostly State owned but there are also private physical owners. Port Authority cannot buy off the land, it is long process and requires serious financial means (buying off the land is financed by the State). Entrance in the port is not solved on a satisfying way, there are bottlenecks when goods arrive by the road.

Port operators do not have long term contracts with port users, which reflects directly on insecurity of port traffic and transhipment amounts and yearly plans of port operators and Port Authority.

7.1.2.3 Opportunities

Vukovar Port is situated on corridor VII – Danube River and is navigable throughout a whole year. It has a good accessibility and good connectivity with main road corridors and railways. The port area should be 100% owned by the State and managed by Port Authority. In that way granting the concessions would be easier. Legal rules for concessions and other are strict and they should be more flexible in order to enable better adjustments to market demands. Financial investments possibilities through PPP and EU funds should be better researched and used, projects should be well prepared. Market demands should be investigated in order to build necessary capacities. Passenger railway is going to be built and the port area will be decreased, Port Authority should try to designate the railway to industrial purposes in future. Port bank is partially regulated and it should be improved. Basis for everything aforementioned are quality development plans and improvement of marketing activities.

7.1.2.4 Threats

Market for port operators is not stable, there could not be good planning of cargo volumes and type in ports that means a certain insecurity and it reflects directly on investments and revenues planning. Costs of buying off the land are high and they are not possible to be paid from EU funds, so the land should be bought by the State money. When the owner refuses to sell his land there is possibility for the expropriation procedure which is strict and long (for few years). Port area is planned to be expanded, but it is a long procedure.

Realization of a big project of a State interest, Canal Danube – Sava, is uncertain and it reflects directly on port development, because it is planned within all strategic documents and in space plans. This project, if realize, will make the possibility for goods to change their way and to decrease in Vukovar Port. The railway building for the passenger traffic shall be a burden for the port and its development.

Development plans are of low quality what reflects directly on possibility for EU funds applying.

Port operators have the concession contracts based on business plans given within the tender procedure for concession grants. Mostly those plans and investments are not realized which is connected with port traffic and revenues planning. They also have old and outdated equipment and technologies that is used and it should be modernized.

7.2 Port of Slavonski Brod SWOT analysis

7.2.1 Introduction

Port of Slavonski Brod is located on the core TEN-T network, on the border of the Republic of Croatia and Federation of Bosnia and Herzegovina. Founded and 100% owned by the Republic of Croatia, Port Authority Slavonski Brod is established for management and development of ports and piers on the Sava river from 207-467 river km.

Port of Slavonski Brod, with the total surface of the port area of 900.000 m^2, is located on the left bank of the Sava River, approximately 4 km southeast of the town of Slavonski Brod.

Concept of development of the port includes operational part of the coast with necessary facilities (quays, handling area, cranes, open and closed storage and other facilities for performance of port activities) and economic zone in the hinterland of the port intended for potential investors to perform manufacturing, energy and service activities. Quay No. 3, for general cargo, total length of 120 m, with handling area is already built in the port area, as well as part of basic infrastructure in the wider port area (roads, storm water drainage, public utilities infrastructure and equipment).

Table below shows throughput in the last three years by the type of cargo:

Table 13: Cargo throughput in the Port of Slavonski Brod

TYPE OF CARGO (t)	YEAR		
	2015.	2016.	2017.
Crude oil	53.901	77.642	71.138
Gravel	109.620	71.480	22.000
Sand	0	48.690	23.400
General cargo	949	0	285
TOTAL:	**164.470**	**197.812**	**116.823**

(Source: Port Authority of Slavonski Brod)

7.2.2 SWOT analysis

Table 14: SWOT matrix for the Port of Slavonski Brod

Strengths	Weaknesses
• International and entry port of Slavonski Brod • Good traffic position • Connected to the road and rail network • Through the rail network connected with major Croatian maritime ports Ploče, Split, Zadar and Rijeka • Competitive fees	• Basic port infrastructure not built • Unregulated watercourse of the Sava river • Insufficient own resources for investment • Weak marketing strategy for inland waterways
Opportunities	**Threats**
• Great potential for development into the intermodal logistic center • New opening job positions • Positive impact on the development of the city of Slavonski Brod and Brod-Posavina County • Development of economic activities • Increase in quantity and type of overloaded cargo • Co-finance construction of basic port infrastructure with EU funds	• Failure to find potential investors • Prolonged end date of the construction of basic infrastructure • Low interest for use of the port services

(Source: Port Authority of Vukovar & Port Authority of Slavonski Brod)

7.2.2.1 Strengths

Since Port of Slavonski Brod is located on the border of the Republic of Croatia and Bosnia and Herzegovina, and Sava River is a border river, that makes the port an international and entry port of European Union which requires basic infrastructure to be operational and open to the public. Due to its favourable position and already built infrastructure, the port is connected to the railway and road network which allows handling, storage and diverting cargo to inland waterways towards the Danube and Black Sea. Transport of cargo by river is also more cost-effective mode of transport and more environmentally friendly.

7.2.2.2 Weaknesses

Project of the basic port infrastructure construction is in the process of being implemented for a very long time due to insufficient resources to finance the costs which prolongs opening of the port for the public and reduces the interest of potential investors.

The waterway of the river save is not regulated for all categories of vessels. This also contributes to the reduced interest of potential investors in the port area as well as potential port services users for transport of cargo by river.

7.2.2.3 Opportunities

Due to its favourable location, that connects river, road and railway traffic, the port of Slavonski Brod has great potential for development into the intermodal logistic center. Building of basic port infrastructure, the increased interest of the investor and the possibility of co-financing the construction of EU grants will have a positive impact on the development of the city of Slavonski Brod and Brod-Posavina County due to new opening job positions and reduction of unemployment, development of new economic activities in the hinterland of the port which can lead to increased interest for port services and ,consequently, increase in quantity and type of cargo overloaded.

7.2.2.4 Threats

Prolonged end date of the construction of basic port infrastructure can result in loss of interest with potential and existing investors who have a key role in the development of economic activities in Port of Slavonski Brod. Also, waterway of Sava river must be regulated in order to provide security to port user in transport of their cargo to the definite location. If the Port does not have conditions to offer at least basic infrastructure and basic port services to potential investors, there is a risk of low interest for use of port services and loss of potential revenues.

7.3 Country-wide SWOT analysis of the Croatian port industry

Table 15: SWOT matrix for the port industry in Croatia

Strengths	Weaknesses
• All of the Inland Ports (Including Vukovar and Slavonski Brod) are defined as of State interest which guarantees State investments • Public interest is protected in public ports by law and port authorities • All port users have the same terms in public ports (port dues and accessibility) • Experience in EU projects • Good networking with other inland navigation and port administration institutions along the Danube • Association of Inland Port Authorities	• All of the Inland Ports (Including Vukovar and Slavonski Brod) are defined as of State interest which guarantees State investments even for ports that have no development (or that are of a lower) perspective • There are no clear criteria for inland ports development needs and plans • There are no clear criteria of port categories defining • Infrastructural projects are not prepared for EU funding • Staff in Ministry and port authorities is not educated for big investment projects preparation and implementation • Land within the ports has different owners which demands lots of financial means to solve it • Association of Inland Port Authorities needs a redefinition of activities
Opportunities	**Threats**
• Good position of ports Vukovar and Slavonski Brod and good connectivity with mail roads and railways • Good planning of inland ports development • Navigability in Vukovar port for 365 days a year • Accessibility of EU funds	• Lack of the clear strategies and development plans • Investment projects are not prepared and not ready for the EU funds • Canal Danube – Sava project feasibility • Economic situation in the Eastern part of Croatia reflects on the port development • Some of inland ports have problems with navigation and accessibility for vessels • Port operators depend on economic situation – they are not stabile

(Source: Port Authority of Vukovar)

7.3.1.1 Strengths

All of the Inland Ports (Including Vukovar and Slavonski Brod) are defined as of State interest which guarantees State investments for all of them. At the same time, we consider it to be a weakness. Port of Vukovar and Slavonski Brod are good positioned and connected with roads and railways. Public ports are accessible for all users under same conditions, port dues are same for every user of port (although they can differ between ports).

Port authority staff is experienced in EU projects management and implementation (soft projects).

Vukovar Port Authority has good contacts with other similar institutions and inland navigation administrations along the Danube.

Association of Inland Port Authorities is established in Croatia and it can be a lever for better cooperation between port authorities and development of inland ports and inland navigation in Croatia.

7.3.1.2 Weaknesses

All of the Inland Ports (including Vukovar and Slavonski Brod) are defined as of State interest which guarantees State capital investments even for ports that have no perspective due to navigability, traffic absence. Clear criteria for inland ports development needs and plans for development should be defined by the national strategies and regulations and they should be measurable. There are no clear criteria of port categories defining. Those criteria have to measurable by the cargo volumes and other important inputs. Infrastructural projects need good and detailed preparation for EU funding and staff needs education for implementation of such projects.

Land within the ports has different owners which demands lot of financial means to solve it. Association of Inland Port Authorities needs a redefinition of activities, it has to cooperate with maritime ports, with international organizations, to participate in EU projects and to be more proactive in general.

7.3.1.3 Opportunities

Ports of Vukovar and Slavonski Brod are both good positioned and connected with main roads and railways. Vukovar port is navigable during a whole year. EU funds are accessible for port development.

7.3.1.4 Threats

Strategic documents and inland ports development plans are not in line with each other and they contain some projects of doubtable purpose (like Danube-Sava Canal). The feasibility study for the Danube – Sava Canal is still under the public procurement procedure. Agency for Inland Waterways is in charge for this activity. It is also questionable for this Study should it

be done only from the inland navigation point of view (Canal has also agricultural significance) etc.

Economic situation in the eastern part of Croatia reflects directly on the port development in negative sense. If the economic situation would be better traffic amounts in ports should significantly increase. Port operators are also dependant on the economic environment and the situation reflects directly on their work and stability.

Some of the inland ports have permanent problem with navigability (Slavonski Brod) so their activities are more oriented on port area “other economic activities”.

8 Serbia

8.1 Port of Novi Sad SWOT Analysis

8.1.1 Introduction

The Port of Novi Sad lies along the left bank of the Danube River at km 1254, at the entrance of the Danube-Tisza-Danube Canal (DTD Canal). Port area covers total surface of 24,19ha on both sides of the canal between city centre and industrial zone. There is no free space for further development within the port area. Maximum available draft is maintained at 4 meters, but waterway limitation is usually less (2,5m). Its maximum designed cargo handling capacity is 2.000.000 tons/year.

The owner of the port land and most of the infrastructure is Republic of Serbia. Only the infrastructure of the Oil Terminal is owned by the private company operating the terminal.

Port is open to the public and managed by the Port Governance Agency. Currently, there are two licensed port operators in the Port of Novi Sad. "Luka Novi Sad" a.d. is a joint stock company operating the Multipurpose Terminal. Majority of shares (99%) are owned by the Republic of Serbia, and there is ongoing privatisation process. "NIS" a.d. is a joint stock company operating the Oil Terminal.

Most frequent cargoes handled are grain, cereals, fertilizers, salt, oil products and steel scrap. Agricultural products have the largest share, followed by the fertilisers and oil refinery products. Total throughput of the port in the period from 2012 to 2016 is between 1 and 1,4 million tons.

The Port of Novi Sad is located in the vicinity of the rail/road Trans European transport corridor X (Budapest – Belgrade – Thessaloniki). Road connection of the port area with the corridor is less then 3km, while rail connection is only 300m long. Connection with the other part of road corridor X (Ljubljana – Zagreb – Belgrade) is available through the state road Novi Sad – Ruma. Being centrally located and the administrative centre of Vojvodina province, Novi Sad has good road connections with all cities and municipalities in province, through network of state roads.

At the same time, port is positioned on the part of the river Danube which complies with the class VIc, allowing the service of vessels with maximum length and tonnage.

Due to its geographical location, Port of Novi Sad has potential to be developed as an intermodal port centre. Thus, port is proposed by the Serbian Government to be included as one of the Core Ports on the Rhine-Danube Corridor.

8.1.2 SWOT analysis

Table 16: SWOT matrix for the Port of Novi Sad

Strengths	Weaknesses
• S1: Port management model • S2: Good strategic position. • S3: Good connection with national and international road and rail network. • S4: Railway tracks along the quay wall. • S5: Experienced Port Operators. • S6: Organisational flexibility of the Multipurpose terminal to deal with different type of cargo.	• W1: Limited space available for the extension of Port area. • W2: Out of 800m of Multipurpose terminal quay wall, only 170m is vertical quay, the rest is sloped quay. • W3: Lack of equipment for waterside handling of containers and heavy weight cargo. • W4: Lack of storage space for agricultural products (silo) • W5: Focused mostly on agricultural products
Opportunities	**Threats**
• O1: Part of the Rhine Danube Core Corridor Network. • O2: Works on the Danube critical sectors • O3: Investments in major road and railway corridors. • O4: Redevelopment of industrial production. • O5: Possibility of new investments (Public Private Partnership, EU funds etc.).	• T1: Danube river navigation restrictions. • T2: Seasonal character of the majority of transhipped cargo. • T3: Unstable market and demand for port services

(Source: Port Governance Agency – PGA)

8.1.2.1 Strengths

S1: Port management model.

Landlord model of port management is implemented in accordance with the law. Property issues are resolved. Land is owned by the state, and Port is managed by the Port Governance Agency. Infrastructure on the Multipurpose terminal is owned by the state, and "Luka Novi Sad" ad holds the licence for Port Operations. This state owned company is currently under privatisation process.

Infrastructure of the Oil terminal is owned by the private company NIS ad which also holds the licence for Port Operations.

Stable management and solved property issues are the bottom line for further investments in Port.

S2: Good strategic position.
Being centrally located and the administrative centre of Vojvodina province, Novi Sad has good road connections with all cities and municipalities in province, through the network of state roads. Together with her transhipment capacities, this makes Port of Novi Sad the most attractive point for the export of agricultural products or import of fertilisers necessary for agricultural production.

Novi Sad is the second largest city in the Republic of Serbia and important consumer market. Large industrial zone is located on the city outskirts.

S3: Good connection with international road and rail network.
The Port of Novi Sad is located in the vicinity of the rail/road Trans European transport corridor X (Budapest – Belgrade – Thessaloniki). Road connection of the port area with the corridor is less then 3km, while rail connection is only 300m long. Connection with the other part of road corridor X (Ljubljana – Zagreb – Belgrade) is available through the state road Novi Sad – Ruma.

S4: Railway tracks along the quay wall.
Railway tracks (3) in total length of 1188m (393m+471m+324m) are positioned along the quay. This infrastructure enables servicing block trains and multimodal port operations.

S5: Experienced Port Operators.
Both, Multipurpose and Oil Terminal Port Operators are experienced and well trained.
During the high season in export of agricultural products, working hours are extended to 24/7 in order to serve all port users.

S6: Organisational flexibility of the Multipurpose terminal to deal with different type of cargo.
In past several years Port of Novi Sad was commercial port with highest throughput in Serbia. Due to unstable market, sometimes there is necessity for fast transition to other types of cargo and adjustment to the user needs.

8.1.2.2 Weaknesses

W1: Limited space available for the extension of Port area.
The port lies between the urban area and canal and there is no land available for the extension of the Port area.

W2: Out of 800m of Multipurpose terminal quay wall, only 170m is vertical quay, the rest is sloped quay.
During the low water-level periods, productivity of the cranes on the sloping quay is low. Vessels are positioned further from cranes and already slow crane operation (due to the outdated technology) is delayed for the time necessary to undergo additional movement.

W3: Lack of equipment for waterside handling of containers and heavy weight cargo.
Waterside handling of multimodal units and heavy weight cargo is limited with the lifting capacity of the portal crane (27t).

W4: Lack of storage space for agricultural products (silo)
There is no proper storage space for agricultural products in the port. During the high season, even the 24/7 operations are not enough to serve all the needs of the customers. Transhipment from trucks to vessel demands sophisticated organisation of port traffic, but still bottlenecks can occur on access roads.

Construction of grain silo of at least 20.000t, as well as a larger capacity system for handling grains, fertilizer components and fertilizers should be considered.

W5: Current focus mostly on agricultural products.
Due to diverse reasons (i.e. dry season, bad harvest, low market price etc), export of agricultural products can decrease roughly, which is directly affecting Port throughput and its financial sustainability.

8.1.2.3 Opportunities

O1: Part of the Rhine Danube Core Corridor Network.
Being part of the Rhine Danube Core Corridor Network will enable Port of Novi Sad to attract new markets and further investments for port development.

O2: Works on the Danube critical sectors
Ministry of Construction Traffic and Infrastructure has started river training and dredging works at six critical locations along the Serbian sector of the Danube between Backa Palanka and Belgrade (rkm 1287 to rkm 1195) in order to improve the navigation conditions during low water periods. Goal is to enable permanent safe navigation conditions that will make waterborne transport reliable.

O3: Investments in major road and railway corridors.
In recent years significant investments are being made in road and railway infrastructure. Road corridor X (Budapest – Belgrade – Thessaloniki and Ljubljana – Zagreb - Belgrade) is almost completed, while the construction of the so-called corridor XI (connection with Montenegro – Port of Bar) has started. Several major reconstructions of the railway network are in progress. This will enable better connection with Adriatic and Ionian ports, as well as easier access to Port for domestic users.

O4: Redevelopment of industrial production.
Industrial production is generating possible new cargo for Port. This also creates a demand for additional logistic services. As the value of product is higher, demand for quality logistic services is growing.

O5: Possibility of new investments (Public Private Partnership, EU funds etc.).

Existing legal framework has been harmonised with EU, and enables PPPs (Concession agreements). EU funds for investment in ports are becoming available.

8.1.2.4 Threats

T1: Danube river navigation restrictions.
Due to low water levels on the lower Danube sections, there are frequent navigation closures, or vessels are forced to load with the lower draft. Alternative transport (rail, road) is used, or the goods are simply stored in ports awaiting safe conditions for navigation. These delays are usually increasing overall transport costs. As soon as navigable conditions are improved, large quantity of stored goods for export are commonly a cause of congestion in port.

T2: Seasonal character of the majority of transhipped cargo.
This is the main reason for port congestions in high season, as well as "silent" periods in low season. Staff optimisation is very demanding within these cycles.

T3: Unstable market and demand for port services
Demand for port services depends on the level of national and international trade, as well as industrial and commercial development of the port hinterland.

8.2 Port of Belgrade SWOT analysis

8.2.1 Introduction

The Port of Belgrade lies along the right bank of the Danube River at km 1168, has one basin and covers surface of approximately 90ha. Its maximum designed cargo handling capacity is 3.000.000 tons/year and 12.000 TEU/year. Maximum available draft is maintained at 4 meters, but waterway limitation is usually less (2,5m). Port has been equipped for waterside handling of multimodal units. Area of 12.000m2 is reserved for the container terminal.

Located on the intersection of the rail/road corridor X and Rhine Danube corridor, the Port of Belgrade has international importance.

Republic of Serbia is the owner of the port land, while the infrastructure is owned by the private company operating the port.

Port is managed by the Port Governance Agency and is open to the public. Currently, there is one licensed port operator in the Port of Belgrade. "Port of Belgrade" a.d., as a single port operator, is a joint stock company with the majority of shares owned by a private company.

Most frequent cargoes handled are salt, metal products, steel scrap, coal and fertilizers. Overall cargo volume is decreasing due to the urban development around the port and traffic limitations. In 2007 and 2008 metal products and construction materials had the largest

share, but salt and fertilisers have steadiest volumes which are slightly increasing. In the period from 2007 to 2016 total throughput of the port was between 200.000t and 350.000t.

Surrounded with the urban city area, the Port of Belgrade is experiencing problems with cargo coming in and out of port by road or railway. City has limited transit of heavy trucks through the city centre. Currently port has only on road link with the city ring road through the old bridge over the river Danube. It is also expected that current railway connection of the port will be soon terminated.

However, the city of Belgrade is positioned on the crossroads of several corridors. Rhine Danube corridor is very important for the transport system of the Republic of Serbia, as it connects Black Sea and the North Sea and major hubs in overseas trade. From Belgrade to its mouth, river Danube complies with the class VII, which is expected to allow the service of vessels with maximum length and tonnage.

As the urban area is expanding towards the port, and there is no free space for further development within the port area, authorities started planning activities for development and construction of the new port in Belgrade.

8.2.2 SWOT analysis

Table 17: SWOT matrix for the Port of Belgrade

Strengths	Weaknesses
• S1: Port Infrastructure • S2: Available warehouses	• W1: Micro-location of the port • W2: Access roads • W3: Connection to the railway network • W4: Outdated equipment with low level productivity • W5: Human resources
Opportunities	**Threats**
• O1: Construction of the New Port on the different location	• T1: Faster development of nearby ports

(Source: Port Governance Agency – PGA)

8.2.2.1 Strengths

Port with the biggest infrastructure and superstructure in Serbia. Port basin with vertical quay of 610m and sloped quay of 330m, two covered berths for loading/unloading regardless of weather conditions, railway tracks in total length of 12km (five tracks along the quay for waterside transhipment), available warehouse capacity (200.000 m2 covered and 600.000 m2 open) etc.

8.2.2.2 Weaknesses

Port of Belgrade is located in the immediate vicinity of the city centre, surrounded by the urban environment, thus experiencing difficulties with cargo leaving the port by road or railway.

City of Belgrade has forbidden transit of heavy trucks through the city. At the moment, sole connection of the port with the city ring-road and further to the hinterland is through the old bridge over Danube which is frequently congested.

Existing railway connection (passing by the city centre) is going to be terminated in few months, because the city development. Traffic will be continued through the tunnel which has its limitations when it comes to the cargo transportation.

Portal cranes are more than 60 years old, hard to maintenance and with low productivity. Port throughput is constantly decreasing and operations are not sustainable with no ability to invest in new equipment.

Difficulties to recruit new qualified staff. Average age of employees is over 50.

8.2.2.3 Opportunities

In Accordance with the Strategy for the Development of Waterborne Transportation Development in Republic of Serbia 2015-2025, Spatial Planning documentation has commenced for the Construction of the New Port of Belgrade on the different location.

8.2.2.4 Threats

Faster development of nearby Port of Smederevo or Port of Pančevo could take over the role of the Belgrade port and logistic centre.

8.3 Country-wide SWOT analysis of the Serbian port industry

Please summarize the aspects of strengths, weaknesses, opportunities and threats which are more related to the national level, rather than to the local, port level.

Table 18: SWOT matrix for the port industry in Serbia

Strengths	Weaknesses
• Port management model • Good strategic position • Good connection with national and international road and rail network • Railway tracks along the quay wall • Experienced and flexible Port Operators • Multimodality • Navigability of the Serbian section of the river Danube	• Port infrastructure • Old equipment • Lack of equipment for waterside handling of containers and heavy weight cargo. • Lack of storage space for agricultural products (silo) • Focused mostly on agricultural products or certain industry in the hinterland
Opportunities	**Threats**
• Rhine Danube Core Corridor Network • One belt one road • Redevelopment of industrial production. • Containerization • Modal shift • Ecological awareness	• Danube navigability • Unstable market and demand for port services • Road & Railway transportation • Different custom area • Lack of qualified stuff • Global economy

(Source: Port Governance Agency – PGA)

8.3.1.1 Strengths

Port management model

Landlord model of port management is implemented in accordance with the law. Property issues are resolved. Land is owned by the state, and Ports are managed by the Port Governance Agency. Infrastructure is partly owned by the state, and partly by private operators.

Stable management and solved property issues are the bottom line for further investments in Port.

Good strategic position

Being centrally located on the Balkan peninsula and along the middle section of the navigable river Danube, Serbian ports have good strategic position. Most of ports are located directly along the trans-European axis Rhine-Danube on the intersection with road/rail corridor X, which enables direct connection with Adriatic, Ionian, Black Sea and North Sea ports.

Good connection with international road and rail network
All ports in Serbia are well connected with the national road network and most of them are connected with the rail/road Trans European transport corridor X (Budapest – Belgrade – Thessaloniki, or Ljubljana – Zagreb – Belgrade strech).

Experienced and flexible Port Operators
Most of licensed Port Operators are companies with extended experience in the field of Port Operations. Lack of modern equipment is usually compensated with the better organisation of work process. Due to unstable market, sometimes there is necessity for fast transition to other types of cargo and adjustment to the user needs.

Multimodality
Majority of Serbian ports has railway tracks along the operational quay walls.

Navigability of the Serbian section of the river Danube
Relatively good navigable conditions of the Serbian sector of the river Danube. Thanks to the Djerdap I and II dams there are no navigation problems due to low water level on the lower section. Critical sectors on the stretch from Belgrade to Bačka Palanka are identified and works are ongoing. Despite several critical sectors, high navigability rates over the whole year are reached.

8.3.1.2 Weaknesses

Port infrastructure
Majority of port infrastructure is constructed 50 (or more) years ago. Dominant wharf design was with sloped quay wall, which is slowing down loading/unloading operations during the periods of low water level. At some ports only small part of the infrastructure was built (only 100m of quay, no railway tracks etc.).

Old equipment
Low productivity due to the aged portal cranes and other equipment. Market conditions (limited cargo volumes) and sustainability of port operations in past 25 years are the main reason for no investment in this field.

Lack of equipment for waterside handling of containers and heavy weight cargo.
With the exception of the Port of Belgrade and Port of Prahovo, all other ports are limited with the portal crane lifting capacity (27t or less) for handling containers. Handling of heavy weight cargo is limited for the same reason. Also, there is no RoRo ramp in any Serbian port.

Lack of storage space for agricultural products (silo)
Considering the seasonal character of agricultural products, appropriate storage space in ports in Vojvodina region is missing. Coordination and planning of vessel loading/unloading operations in high season would be more convenient if the goods are already in port.
Similar situation is with other ports which are predominantly constructed to serve certain industry in the hinterland. Now, when they are open to public, there is lack of storage space.

Focused mostly on agricultural products or certain industry in the hinterland
Due to diverse reasons (i.e. dry season, bad harvest, low market price, industry failure etc), port throughput can decrease roughly, if the port is focused only on certain product or industry. This is directly affecting Port financial sustainability.

8.3.1.3 Opportunities

Rhine Danube Core Corridor Network
Position on the Rhine Danube Core Corridor Network could enable ports to attract new markets and further investments for port sector development.

Considering that Serbia has signed trade agreements with Russian Federation, EU, China, USA, Kazakhstan, Turkey, Belarus, CEFTA, EFTA etc., Ports on the Rhine Danube Core Corridor Network can serve as regional logistic centres.

One belt one road
Serbia is part of "16+1 initiative" where priority areas for economic cooperation are set for: infrastructure, high technologies, and green technologies. Some infrastructure projects like railway rehabilitation are already ongoing and are expected to create new trading routes.

Redevelopment of industrial production.
Development of industrial production can generate growth of cargo suitable for inland waterway transportation, and consequently higher demand for quality logistic services.

Containerization
Low level of cargo containerization could be improved with the industrial development of the country. Higher demand on the domestic market, together with the increase of transit routes due to infrastructure development could result in container transportation by inland waterways.

Modal shift
Reliable and permanent safe navigation condition on the River Danube could increase share of IWT and shift transport from roads to inland waterways.

Ecological awareness
Raising demand for greener logistics will bring logistic service providers to inland waterways, but at the same time alternative fuels (LNG) should be considered for ship propulsion as well as renewable energy sources for ports.

8.3.1.4 Threats

Danube navigability
Ability to provide year round safe navigation conditions of the river Danube is key for the growth of IWT. Otherwise, the existing cargo can be lost.

Unstable market and demand for port services

Demand for port services depends on the level of national and international trade, as well as industrial and commercial development of the port hinterland.

Road & Railway transportation
Strong competition of this two sectors can be expected.

Different custom area
Serbia is surrounded with EU countries on Danube borders. Custom procedures are time consuming and are slowing down port operations.

Lack of qualified staff
Human recourses are always sensitive issue where special training and specific knowledge are required.

Global economy
Global economic crises are always affecting ports first. Less trade means less cargo throughput. Port management must be very flexible to overcome crisis effects on port and maintain sustainability.

9 Romania

9.1 Port of Drobeta Turnu Severin SWOT Analysis

9.1.1 Introduction

The Port of Drobeta-Turnu Severin is located on the Danube's left side, km 927-934 (near the water storage Hydroelectric and Navigation Complex Portile de Fier 2). The Drobeta-Turnu Severin Port has a strategic location as a transhipment point on the Danube for traffic to west and northwest Romania and cities like Craiova, Târgu Jiu, Reșița.

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

The total surface of the port grouped into 2 areas has in total 13.76 hectares (commercial 9.36 hectares, passengers 4.40 hectares). The annual cargo throughput capacity of the commercial basin is 725 000/tons. The port is operating break bulk cargo, ore, fertilizers, grains, coal, oil products, etc. There are 3 operators: Transeuropa (TTS Transporturi Fluviale), Carghill (grains) and Beo Trade Com (oil products).

The port allows for the mooring of barges up to 3,000 tons and with a draught up to 2.5 m. The length of vertical quays used for cargo operation is 365 m (65 m in the grains operation area).

The grains operator has a 35 m sloped quay. Another 400 m of sloped quays are used as a waiting area and 365 m of sloped quays for winter mooring. There are 3 cranes available (2 with 16 tons capacity and 1 of 15 tons).

The port users are represented mainly by ships operators, terminal operators, shipyard and other companies involved into delivery of inland water transport related services, such as ship's agents, survey companies, etc.

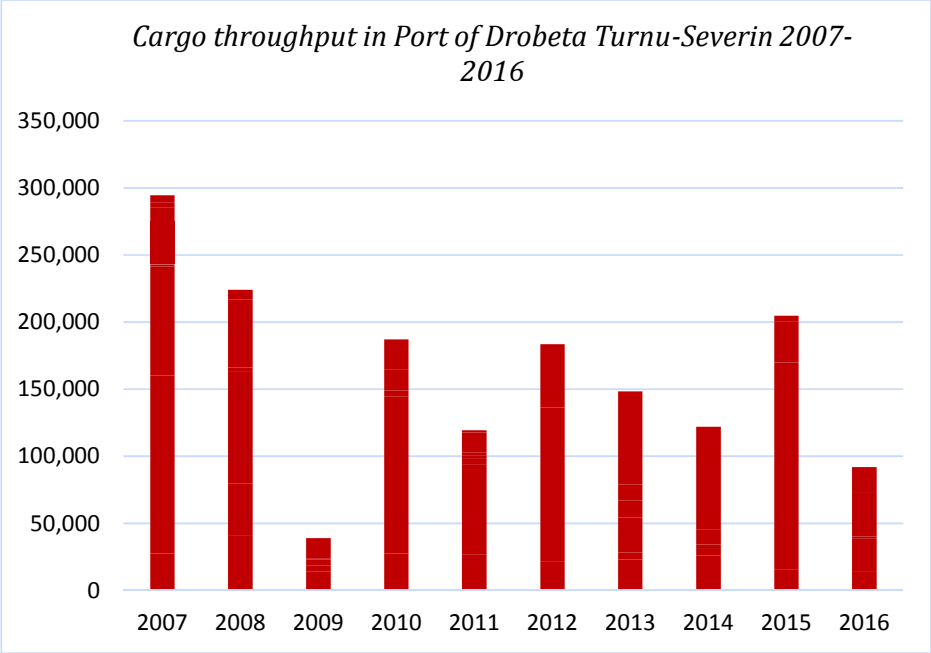

Figure 9: Port statistics 2007-2016 -Drobeta Turnu-Severin (tons)

(Source: MPAC & N.C. Administration of Danube River Ports J.S.Co.)

The general strategies developed by local authorities include among their strengths the position of the city on a European main transport corridor, as well as the connection on rail and road with the region.

The Port of Drobeta-Turnu Severin operated in the last years mainly oil products, grains, fertilizers and metal products.

According to data provided by N.C. Administration of Danube River Ports J.S.Co. Giurgiu, the average annual throughput is about 350.000 tons with good results in 2007, 2010, 2011 and lower values, less than 300,000, in 2009, 2014, 2016.

The lack of investments in port infrastructure and hinterland connection, together with low economic development led to a decrease of cargo traffic in the last two years.

9.1.2 SWOT analysis

The main results of internal and external diagnosis are presented in the below table:

Table 19: SWOT matrix for the Port of Drobeta Turnu Severin

Strengths	Weaknesses
• The use of the corporatized port management model, which allows for development in accordance with market requirements • A good interface with the rail transport • Conditions for the safe operation of ships • The existence of modern waste reception facilities	• The port infrastructure requires significant development investments • Lack of sufficient storage facilities and of high productivity port handling equipment • Low number of specialized terminals • No adequate developments have been made lately • Lack of a masterplan for the port development
Opportunities	**Threats**
• Location on a major European transport corridor • The project for the rehabilitation and modernization of the port infrastructure in the Port of Drobeta-Turnu Severin, including the construction of a new trimodal terminal, is being promoted in the European-funded infrastructure program for the 2014-2020 financial year and is included in the Romanian Master Plan of Transport. • Development of grain production and trade in the area • Availability of low paid human resources • The availability of European funds for the transport infrastructure development • Regional European policies regarding the Danube and Black Sea.	• High delays in the development of the road infrastructure in Romania • Rather limited connections with the hinterland • Insufficient attractiveness level to invest in the area • Low levels of Danube waters during periods of drought • Navigation restrictions on the Danube during the periods with negative temperatures • Lack of significant development projects in the region • Low predictability legal and economic framework • Lack of investments in the industry sector of the city of Drobeta-Turnu Severin and its surrounding area • Tourism regional and national competition.

(Source: MPAC)

9.1.2.1 Strengths

a. Corporatized port

As shown under previous section, following Emergency Ordinance no. 109/2011 on Corporate Governance of Public Enterprises, subsequently amended, the National Company "Administration of Danube River Ports"- Giurgiu which manages the Port of Drobeta-Turnu Severin adopted a corporate management.

In making this decision, the corporate governance principles of state-owned companies, developed by the Organization for Economic Co-operation and Development (OECD), have been taken into account on the basis of the most advanced legal standards and good corporate practice.

b. A good interface with the rail transport

All port terminals have rail connections to the town's station, which is connected to railway corridor 900 Bucuresti-Caransebes-Timisoara.

The railway system is able to provide a connection with the entire transport network in Romania, under efficient conditions and observation of the environmental protection regulations.

c. Safe operation conditions

Port operators take all measures to ensure that ships are operated safely. No accidents on ships or port workers have been recorded in the last period during the operations in the Port of Drobeta-Turnu Severin.

d. Modern waste reception facilities

During 2012-2015, the project *System for receiving and processing of residues from ships and for intervention in case of pollution on the Danube sector managed by CN APDF SA Giurgiu*, financed under POS-T programme was implemented in the Port of Drobeta-Turnu Severin.

The objective of the project was to increase the quality of services for the collection and processing of ship waste and pollution intervention by acquiring ships, installations and equipment, as well as for carrying out the infrastructure works necessary for taking / processing the residues from the river ships through the ports of Moldova Veche, Orsova, Drobeta-Turnu Severin, Giurgiu, Calarasi, Cernavoda under CN APDF SA Giurgiu administration.

Within the project the following were purchased:

- 4 multipurpose collector vessels, having the ports of residence Cernavoda, Calarasi, Giurgiu and Drobeta-Turnu Severin;
- 3 compact water treatment systems consisting of bilge and household wastewater treatment plants located in the ports of Cernavoda, Calarasi and Drobeta-Turnu Severin;
- Containers for solid wastes in the ports of Cernavoda, Calarasi, Giurgiu, Drobeta-Turnu Severin, Orsova, Moldova Veche;
- 3 access towers and 3 pontoons (including quay accessories) procured and assembled to be used for ships' boarding in the ports of Cernavoda, Calarasi and Drobeta-Turnu Severin.

9.1.2.2 Weaknesses

a. Port infrastructure

Although it is located on a main transport corridor, the Port of Drobeta-Turnu Severin still needs serious infrastructure investment. Analyses carried out by the port management have led to the identification of opportunities to finance infrastructure projects deemed as significant for the port development.

b. Storage facilities

Currently, storage facilities in the Port of Drobeta-Turnu Severin are restricted, whereas investments by port operators are necessary for their development as to increase the available capacities for the operated goods.

c. Specialized terminals

The bulk cargo terminal in Drobeta-Turnu Severin has a high degree of utilization and is predicted to be over-used in the future. The port has no dedicated infrastructure for container operation.

The Port of Drobeta-Turnu Severin has warehouses and storage facilities that are not appropriate to modern logistics practices. That is why the building of a new trimodal terminal is needed[1].

d. Lack of development projects

[1]*General Master Plan of Transport in Romania- Revised final version of the Report on the Master, Short and Medium-Term Plan*, Ministry of Transport, September 2014 (in Romanian)

Despite the efforts made to analyse the needs and the attempts made to obtain funding for development projects, no projects are currently in progress.

e. Masterplan

Although the port is mentioned in the Master Plan of Transport in Romania which highlights the needs for its future development, no specific masterplan has been drawn up for the port that clearly highlights the short, medium and long-term development plans.

9.1.2.3 Opportunities

a. Location on a major European transport corridor

The Port of Drobeta-Tunu Severin is located on Rhine-Danube Corridor having the opportunity to develop important infrastructure projects, as well as to attract large volumes of cargo.

This Corridor provides the main east–west link between continental European countries, connecting France and Germany, Austria, Slovakia, Hungary, Romania and Bulgaria all along the Main and Danube rivers to the Black Sea by improving (high speed) rail and inland waterway interconnections.

b. New trimodal terminal

Following the analyses carried out by the management, the development of a trimodal terminal is regarded as an opportunity, leading to a significant traffic development in the Port of Drobeta-Turnu Severin.

Currently, the potential sources of funding for such a project are being determined.

c. Development of grain production and trade

Nowadays, the Black Sea region has become the largest grain exporter in the world, with ships sailing from here towards a large number of importing countries: Albania, Algeria, Bangladesh, Brazil, Cyprus, Croatia, Egypt, Ethiopia, Israel, Iraq, South Korea, Kuwait, Lebanon, Pakistan, Portugal, Georgia, Germany, Greece[2].

The increase in cereal production in the Danube port region and the presence of long-established grain trade companies has led to a significant development in these ports.

[2]Buican, Alexandru, *The Black Sea region has become the world's first grain exporter, with 20% of global production*, Capital, 26 September 2017

d. Human resources

The low salary levels in the South-West region of Romania, along with the existence of an adequate labour force, may be important prerequisites for investors to choose this area for the development of new industrial projects.

Such developments are likely to increase traffic through the port of Drobeta-Turnu Severin and to promote new investments in its infrastructure.

e. European funding

Transnational cooperation programmes like the *Danube Transnational Programme* (DTP)[3] are funding instruments contributing to the realisation of different EU policies and strategies, including macro-regional strategies. Yet, for either policy or (macro-regional) strategy they are only one instrument among further funding opportunities.

Transnational cooperation programmes and macro regional strategies are based on different policy and/or legal frameworks, defining – amongst other - different sets of rules, thematic priorities, internal governance structures and administrative procedures.

The website *EuroAccess Danube Region*[4] lists the most relevant sources of funding from EU programs in the Danube Region and it provides important information on current calls for project proposals.

f. Regional European policies

As it is stated in the *Strategy for Danube Region*[5], historically, the Danube Region has been particularly affected by turbulent events, with many conflicts, movements of population and undemocratic regimes. However, the fall of the Iron Curtain and EU enlargement provide an opportunity for a better future.

The Danube River itself is a major TEN-T Corridor. However, it is used way below its full capacity. Freight transported on the Danube is only 10%-20% of that on the Rhine. As inland waterway transport has important environmental and efficiency benefits, its potential must be sustainably exploited. There is particular need for greater multi-modality, better interconnection with other river basins modernising and extending infrastructure in transport nodes such as inland ports.

[3] www.interreg-danube.eu/about-dtp/eu-strategy-for-the-danube-region
[4] www.danube-euroaccess.eu
[5]Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee of the Regions, *European Union Strategy for Danube Region*, COM/2010/0715 final

9.1.2.4 Threats

a. *High delays in the development of the infrastructure*

Although significant sums have been allocated for this purpose, the development of road infrastructure in Romania is still very much delayed. In 2017 only 15.4 kilometres of the highway were put into operation, while the plan had provided 10 times more.

b. *Hinterland connections*

The port is connected to the city through two roads. Drobeta-Turnu Severin is connected to the national roads DN 6, DN 56, DN 56A, DN 67 and the European road E70.

There is no express road or highway in the region; DN 65 Craiova-Slatina-Pitesti does not meet the European requirements regarding passenger and freight transport. The lack of efficient inter-modal connections and facilities between the railways and the inland waterway network is the main obstacle for the export of low value-added products in the region, such as metals, wood, agricultural raw materials, mining products, etc.

The density of the railways in the S-W Oltenia development region is the smallest in the country - 33.9 km / 1,000 km^2, and the plain area along the Danube does not benefit at all from the railway network[6].

Also, there are no rail border crossing points at Drobeta-Turnu Severin to Serbia, the freight flows between the region and the neighbouring countries being made more difficult.

c. *Insufficient attractiveness level to invest*

The last period of time has been one in which no significant investments in economic objectives have been made in the area of the Port of Drobeta-Turnu Severin being still considered as an area with low level of attractiveness.

d. *Low levels of Danube waters*

An analysis of the history of navigation jamming during 2011-2017 at one of the 31 critical points in the Romanian sector, at Cernavoda, shows that the Danube level was lower than the minimum navigation depth of 2.5 meters in 1,170 of the total of 2,394 days, which means that in almost half, i.e. 49% of this period, it was not possible to navigate under the conditions recommended by the Danube Commission[7].

[6]*South-West Oltenia Region Development Plan 2014-2020*, www.adroltenia.ro (in Romanian language)
[7]Ticu Ciobotaru, *The law that hinders Danube navigation*, România liberă, 18 January 2018

In the same period, 863 days, i.e. 36%, the navigation depth was lower than 1.8 meters. In 2016, there were 87 days with depths below 2.5 meters.

e. Periods of time when the Danube waters are frozen

Also, beside the periods when it is not possible to navigate on the Danube, there are the periods of time when, due to low temperatures, the Danube is frozen or when the navigation conditions are very much hindered.

f. Lack of significant development projects in the region

In the port of Drobeta-Turnu Severin no projects for infrastructure development or port superstructure have been initiated for a very long time.

g. Legal and economic framework

Romania continues to have a legal and economic framework with a high degree of instability, which incapacitates investors to make strategic long-term planning.
A reduction in the frequency of changes in tax legislation and the adoption of regulations meant to stimulate the economic development is expected.

h. Lack of investments

No significant investments have been made in the area in the last period of time, the lack thereof makes the port have a low level of attractiveness and traffic. Strategies need to be developed along with the local authorities so as to promote the opportunity to invest in the port area or the cities of its hinterland.

i. Tourism competition

Investments in tourism in Romania have increased significantly in recent years and, along with them, so has the competition in the field.

Although it is an important point on the agenda of local authorities, tourism in the area has failed to keep its market share. The area still has a great potential for tourism development, but significant steps need to be taken to exploit this potential in the existing competitive environment.

9.2 Port of Giurgiu SWOT analysis

9.2.1 Introduction

Port of Giurgiu is located on the Danube's left side km 489-497. The port is considered to be a port of the TEN-T central network, being located on Rhine-Danube Corridor at the intersection with the north-south route between the Baltic countries and Bulgaria, Greece and Turkey.

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

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

Another part of the port is administrated by Free Zone Administration, which was established in 1996 in order to develop international trade and to increase the use of regional resources. Between 1996-2004 the organization was under the responsibility of Ministry of Transport and from 2004 become a joint stock company owned by the Giurgiu County Council. Starting 2008 the company is fully owned by Local Council Giurgiu[8].

In the Port of Giurgiu there are four locations that offer port facilities[9]:

1. "Ramadan" commercial port: passenger port and berths for operating grains, ballast, coal and general goods.
2. "Plant Canal / St. Gheorghe": grains and general cargo.
3. Cioroiu port: oil terminal.
4. Giurgiu Free Zone: operates general cargo and containers (not in last period), as well as an oil terminal with private administration.

The main categories of port users are represented by ships' operators, terminal operators, shipyards and other companies involved into goods production, storage or trade.

The latest developments in the Free Zone proved the need for the port to focus on addressing all the companies operating in the area as future potential users. The new trimodal terminal which will be developed through the project *High Performance Green Port Giurgiu - Stage II*[10] will provide the missing links with road, rail and inland waterway networks.

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[8] *The Mayor of Giurgiu activity report*, 2016, www.primariagiurgiu.ro (in Romanian)
[9] www.apdf.ro
[10] https://ec.europa.eu/inea/en/connecting-europe-facility/cef-transport/projects-by-country/romania/2014-ro-tmc-0313-w

The Port of Giurgiu has the second port as traffic (after Calarasi) out of ten ports administrated by APDF, with a very dynamic development. During the year 2016 the throughput of the port was 807,226 tons, almost a quarter of the all ten ports. The traffic in last ten years started from about half million tons operated in 2007 and 2008, decreased due to the economic crisis in 2009-2012 and has been recovered for the last years.

As a result of the investments made in the Free Zone during the last period, the traffic has steadily increased. The main types of cargo whose visibly increased traffic is petroleum products (126,644 tons in 2016), grains (217,037 tons in 2016) and fabricated metal products (125,897 tons in 2016).

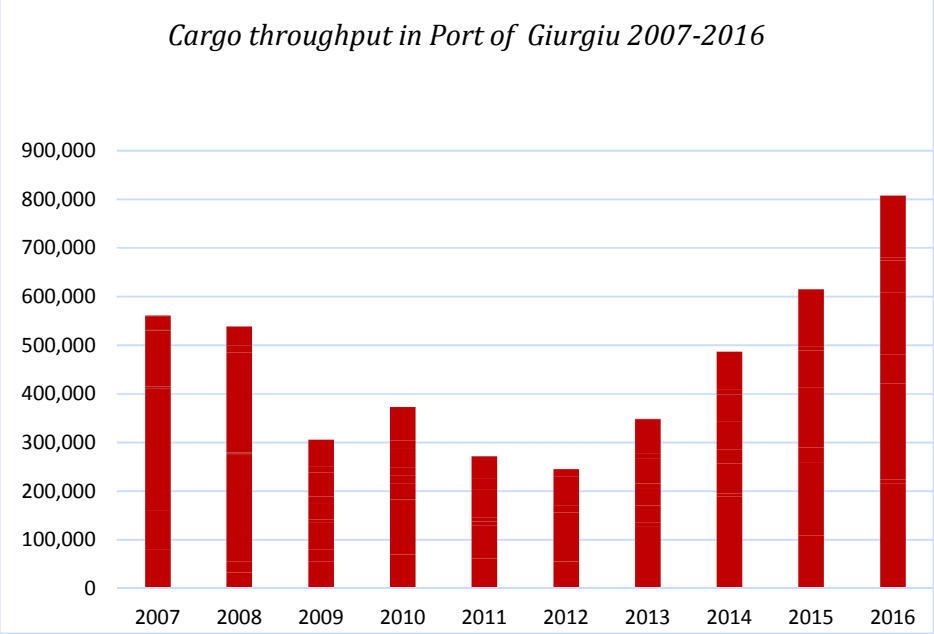

Figure 10: Port statistics 2007-2016 Giurgiu (tons)

9.2.2 SWOT analysis

The main results of internal and external diagnosis are presented in the below table:

Table 20: SWOT matrix for the Port of Giurgiu

Strengths	Weaknesses
• The use of the "corporatized port" management model, which allows for development in accordance with market requirements • Developing partnerships between port operators and the local authorities for port development • The existence of a free zone with development facilities • Port development projects in progress • Conditions for the safe operation of ships • The existence of modern waste reception facilities	• Low capacity to attract tourism in the area • Lack of significant investments in river transport infrastructure • The lack of a port community integrated IT system which would allow for the fast and efficient exchange of information between the companies and the public and private sectors. • Lack of a masterplan for the port development
Opportunities	**Threats**
• Position at the intersection of transport routes • Small distance from the capital of the country • Location on a major European transport corridor • Increased interest of local authorities in port development • Development of grain production and trade in the area • The existence of European funds for the transport infrastructure development • Regional European policies regarding the Danube and the Black Sea.	• High delays in the development of the road infrastructure in Romania • Insufficient attractiveness level to invest in the area • Low levels of Danube waters during periods of drought • Navigation restrictions on the Danube during the periods with negative temperatures • Low predictability legal and economic framework • Low publicity of tourism in the region • The creation of new border crossing points, the construction of new bridges across the Danube on the Romanian-Bulgarian sector can redirect some of the cargo traffic on the maritime sector onto the road

(Source: MPAC)

9.2.2.1 Strengths

a. Corporatized port

Following the Emergency Ordinance no. 109/2011 on Corporate Governance of Public Enterprises, subsequently amended, the National Company "Administration of Danube River Ports"- Giurgiu which manages the Port of Giurgiu adopted a corporate management.

In making this decision it was argued that it is necessary to establish levers to guarantee the objectivity and transparency of the management selection and the members of the management bodies in order to ensure the professionalism and responsibility of the managerial decision, additional mechanisms for the protection of the rights of the minority shareholders and a strong transparency to the public sector of both state-owned companies and the state ownership policy.

b. Partnerships between port operators and the local authorities

Giurgiu is one of the Romanian ports that has managed to involve the local administration in its development. In this respect, the municipality has been involved as a shareholder in the Giurgiu Free Zone Administration, but also as part of the development projects, such as the Project *High Performance Green Port Giurgiu.*

c. Free zone

Giurgiu Free Zone[11]was established by Resolution no. 788/1996of the Romanian Government, in order to promote international exchanges and to attract foreign capital for the introduction of new technologies, as well as to increase the possibilities of using the resources of the national economy, while both the location and the existence of some users with an extended industrial activity give it a special distinctiveness.

The Giurgiu Free Zone covers an area of 160 hectares. What distinguishes it from other free zones in Romania is that it has a predominantly industrial profile, with production units operating here since its establishment.

Companies located in Giurgiu Free Zone include[12]:
Cereal Com SA (owned by ADM) – grains terminal;
TTS SA – bulk and general cargo operator;
Brise Agricultura SA – grains terminal;

[11] *www.zlg.ro*
[12] *The Mayor of Giurgiu activity report* -2016, *www.primariagiurgiu.ro*

Mol Romania Petroleum Products SRL – oil terminal;

Borealis L.A.T –fertilizers import;
OMA Romania S.R.L (Officina Metalmeccanica Angelucci) – metal products;
Vixon Gold S.R.L – liquefied gases storage and trade;
Metalurgica Cavatorta S.R.L – welded nets production;
Holleman Transport & Project Cargo S.R.L – agriculture machinery storage and trade;
ATG Marina S.R.L – ships building, repairs and maintenance;
IMSAT S.A – containers production (10", 20" and 40");
Altius Fotovoltaic S.R.L – photovoltaic panels production;
Melspring România S.R.L – chemical products production and storage;
Transporter S.R.L – grains terminal;
Sea S.R.L – metal products storage and trade;
MistioImpex S.R.L – cement storage and delivery;
Rhenus Logistics S.R.L – fertilizers, grains and rolled steel import;
ILR Logistica Romania S.R.L – rolled steel import;
M-Food Industrie S.R.L. – storage;
Shipyard ATG Marina SRL – ships building, repairs and maintenance.

d. Development projects

The project *High Performance Green Port Giurgiu – Stage II* is under implementation, being scheduled between 05/2015 – 08/2018 (Partners: ILR Logistica Romania Ltd., Free Zone Administration GiurgiuCo., Giurgiu Municipality). The overall budget is 15,594,063 Euro (85% EU contribution).
The general objective of the project includes:

- Improving the quality of the existing port infrastructure in Romania on the Rhine-Danube Corridor;
- Increasing the capacity by upgrading the port of Giurgiu's existing basic infrastructure and by procuring facilities for enhancing loading and transshipment at the port;
- Turning Giurgiu into the first "Green Danube Port" based on "Joint Statement on Guiding Principles for Development of Inland Navigation in the Danube River Basin";
- Supporting modal split by fostering the use of inland waterway transport and eliminating bottlenecks by building the missing links with rail/road/inland waterway networks.

The scope of the action is to:

- Construct the missing links with road, rail and inland waterway networks;
- Build a covered "all-weather" trimodal terminal;
- Develop and implement a supply chain system within the intermodal terminal;
- Upgrade the port water side basic infrastructure;

- Apply for obtaining the EMAS certification for the trimodal "all-weather" terminal.

e. Conditions for safe operation

Port operators take all measures to ensure that ships are operated safely. No accidents on ships or port workers have been recorded in the last period during the operations in the Port of Giurgiu.

f. Modern waste reception facilities

As shown in previous section, during 2012-2015 in the Port of Giurgiu was implemented the project *System for receiving and processing of residues from ships and for intervention in case of pollution on the Danube sector managed by CN APDF SA Giurgiu*, financed under POS-T programme.

Within the project were purchased: multipurpose collector vessels, compact water treatment systems consisting of bilge and household wastewater treatment plants and containers for solid wastes.

9.2.2.2 Weaknesses

a. Low capacity to attract tourism

There are currently significant concerns both at the level of the port management and of the local authorities regarding the development of tourism in the Giurgiu area, but unfortunately tourism is still very little developed.

b. Lack of significant investments

The port has a well-used general cargo terminal for which the forecast shows an over-use until 2030. Giurgiu port has both bulk cargo, general cargo and grains handling facilities, but this port does not have dedicated facilities for container operation[13].
The Port of Giurgiu is affected like the other Romanian inland water ports by important infrastructure gaps. They have been identified in Panteia & PwC's study[14], based on the complaints received from shipping lines and port users:

- *Insufficient water level*

[13] *General Master Plan of Transport in Romania- Revised final version of the Report on the Master, Short and Medium-Term Plan*, Ministry of Transport, September 2014 (in Romanian)
[14] Quoted by *Report on the potential of the port and its capacity for the future,* 212-EU-18089-S – "High Performance Green Port Giurgiu" Project, Version 0.1 Final, 23rd February 2015

- *Lack of quay space, resulting in vessels having to wait for a berth*
- *Lack of storage space behind the quay, often caused by the "city centre" locations of older ports*
- *Insufficient (or outdated) mechanical equipment*
- *Poor interface arrangements for rail and inland waterway transport.*

c. *Port community integrated IT system*

The digitization of all economic activity fields has long highlighted the need for an integrated IT system for port communities, meant to enable a dynamic and efficient data exchange between private companies and public authorities.

d. *Masterplan*

Although the port is mentioned in the *Master Plan of Transport in Romania* which highlights the needs for its future development, no specific masterplan has been drawn up that clearly highlights the short, medium and long-term development plans.

9.2.2.3 Opportunities

a. *Position at the intersection of transport routes*

Port of Giurgiu is considered to be a port of the TEN-T central network, being located on Rhine-Danube Corridor at the intersection with the north-south route between the Baltic countries and Bulgaria, Greece and Turkey.

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

As mentioned in previous paragraph, the Rhine-Danube Corridor provides the main east–west link between continental European countries, connecting France and Germany, Austria, Slovakia, Hungary, Romania and Bulgaria all along the Main and Danube rivers to the Black Sea by improving (high speed) rail and inland waterway interconnections. The countries that have first been aligned with the project are the Czech Republic and Slovenia.

b. *Small distance from the capital of the country*

Even if the Giurgiu County is one of the less developed in the country, the Port of Giurgiu is focussing on the capital of the country Bucharest located at less than 70 km to the port.

In Romania the direct foreign investments increased in 2016 with 22% compared with the previous year and as expected the Ilfov-Bucharest Region attracted the biggest investments (60% of total at national level).

c. *Location on a major European transport corridor*

The port is located on the TEN-T central network, being located on Rhine-Danube Corridor at the intersection with the north-south route between the Baltic countries and Bulgaria, Greece and Turkey. Please see 3.1.2.3.

d. *Authorities commitment*

The Port of Giurgiu is one of the few Romanian Danube ports where the interest of local authorities in the development of the port infrastructure and the superstructure is demonstrated by a high level of involvement.

The municipality is a shareholder of the Giurgiu Free Zone and part of the *High Performance Green Port Giurgiu.*

e. *Grain production and trade*

As with the other Danube ports, the development of grain production and trade in the area has represented a significant factor in the traffic growth in the Port of Giurgiu.

While the grain trade did not exceed 70,000 tonnes during 2007-2012, starting 2013, a dynamic growth began, reaching 217,000 tons in 2016, almost twice as much as the year before.

f. *European funding*

Transnational cooperation programmes like the *Danube Transnational Programme* (DTP)[15] are funding instruments contributing to the realisation of different EU policies and strategies, including macro-regional strategies.

[15] www.interreg-danube.eu/about-dtp/eu-strategy-for-the-danube-region

The website *EuroAccess Danube Region*[16] lists the most relevant sources of funding from EU programs in the Danube Region and it provides important information on current calls for project proposals.

g. Regional European policies

As shown in previous section, European policies for the Danube Region have been defined, meant to lead to a harmonious development of this region.

9.2.2.4 Threats

a. Delays in the development of the road infrastructure

The development of road infrastructure is probably the most important transport objective in Romania. However, results fail to appear.

b. Insufficient attractiveness level to invest

The last period of time has been one in which some investments in economic objectives have been made in the area of the Port of Giurgiu. However, the results are far from the potential of this area.

There still is a positive impact of investments in the area of the capital city on the development of port traffic, but much more dynamic steps are needed in order to promote investments in the area of the Port of Giurgiu, which will contribute to its development.

c. Low levels of Danube waters and periods of time when the Danube waters are frozen

Although it offers the possibility of a more economic and environmentally friendly transport, the Danube is not a proper waterway all the year round. There are still a great number of days when navigation is not possible either because of the depths or the ice.

d. The legal and economic framework

The legal framework in Romania includes a number of provisions reflecting the policies meant to attract investments and to develop the areas with lesser economic performance.

However, some appreciations have been delivered with respect to the lack of a medium and long-term strategy that offers potential investors a clearer picture of the opportunity to develop new economic goals.

[16] www.danube-euroaccess.eu

e. Low publicity of tourism

Although its location near the capital city should be a reason for the increase in the traffic of passenger ships mooring in the Port of Giurgiu, the promotion of this tourist potential and of other objectives in the area fails to reach the level required in order to exploit this opportunity.

f. Construction of new bridges over the Danube

In the last period of time, new cross-border infrastructure projects to be undertaken by Romania and Bulgaria have been under consideration. They have mentioned four new bridges that could be built over the Danube.

Thus, a new Giurgiu - Ruse bridges shall be built, with an estimated cost of 248 million euros. And so shall the Oriahovo - Bechet bridge, with a price of 217 million euros, Nicopole – Turnu Magurele bridge, estimated at 209 million euros and the Silistra – Calarasi bridge that could cost 193 million euros[17].
Currently, Romania is linked to Bulgaria by two bridges: Giurgiu - Ruse (also called the Friendship Bridge, opened in 1954) and Calafat - Vidin (inaugurated in 2013).
All these infrastructure developments could increase cargo traffic on road and rail, affecting mainly the river transport.

9.3 Port of Constanta SWOT analysis

9.3.1 Introduction

The Port of Constanta is located in Constanta, Romania, on the Western coast of the Black Sea, at 179 nautical miles from the Bosporus Strait.

The connection of the port with the Danube river is made through the Danube-Black Sea Canal, ending the Rhine-Danube Corridor, which provides the main east-west link across Continental Europe.

The Port of Constanta land is owned by the Romanian State and was granted through a concession contract to the port administration N.C. “Maritime Ports Administration” J.S.Co. Constanta, which is a joint stock company (80% Ministry of Transport, 20% Proprietatea Fund).

The Port of Constanta covers 3,926 ha of which 1,313 ha is land area and the rest of 2,613 ha is water area. The total land area of 1,313 ha is shared between the North Port that occupies

[17] *www.economica.net*

a land area of about 495 ha and the South Port with about 818 ha. Another 561 ha are included, according to the masterplan, in development project for short, medium and long-term perspective.

The maximum draught natural or dredged is 18 m. The historical part of Constanta Port the so called Old Port, located in the most northern port area has a limited water depth of 8.25 m.

The cargo handling capacity is around 110 mil tons per year including liquid bulk, dry bulk, containers, Ro-Ro and general cargo.

The Port of Constanta is a container hub and is the most important container terminal in the Black Sea with a throughput capacity of 1.5 million TEU/year.

The hinterland of Constanta Port supports the port regarding the produced, consumed and forwarded goods to/from the port. During the last decade, the Port of Constanta efficiently served the flows of goods that arrive or depart from/to the Central and Eastern Europe, including: Austria, Czech Republic, Slovakia, Hungary, Serbia, Bulgaria, Moldova and Ukraine. The Port of Constanta handled 59,424,821 tonnes in 2016 and had 14,516 vessel movements of which 34% were maritime-related and 66% on to the river network (9,233).
In the last four years the total throughput has increased every year and this allows us to consider that the Port of Constanta is on its true course, meaning a steady annual increase.
The year 2016 also meant the strengthening of the hub position for the transit of cargo coming from the landlocked countries of Central and South Eastern Europe and Constanta played this role by achieving a traffic of grains of 20,393,803 tones, thus becoming the leader of the Black Sea agribulk market.

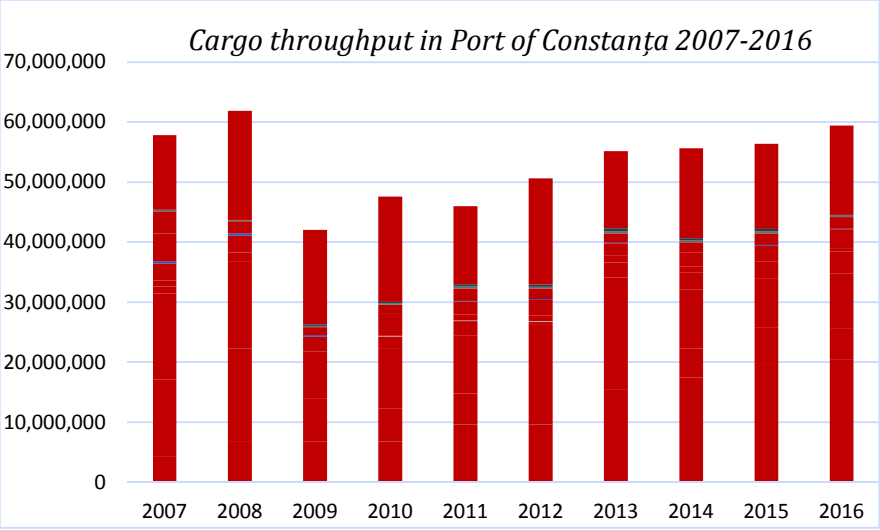

Figure 11: Cargo statistics 2007-2016 Port of Constanta

(Source: MPAC)

There is a plan for the development of the energetic sector through a new LNG terminal. The objective is to establish the position of Constanta Port as hub for the LNG import/transit in the Black Sea region and for the landlocked Danube countries, to decrease the dependency of the national energy supply on Russian natural gas monopoly and transit problems (Ukraine), to cover the LNG supply for the expected increase of LNG fueled vessels and to boost the LNG fuel not only for shipping and transportation sector but also for other purposes as energy source for residential, commercial and industrial sectors.
The majority of transported goods on the Danube are dry bulk cargos. For Romania the commodity split is as follows: ~40% grains, ~25% iron ore, ~10% non-ferrous ores and scrap, ~10% coal and coke, ~5% fertilizer and 5% oil products.
According to the Annual reports[18] and data provided by NC Maritime Ports Administration J.S.Co. Constanta, the total volume of products of agriculture, hunting, and forestry (mainly grains) traffic in the Port of Constanta has seen constant increase, with an extra increase during the past 5 years. In 2016, the port handled approximately 20 million tons of grain with a growth of more than 400% compared to the 2007 year.
In 2017 about 58,4 mil tons were operated in the Port of Constanta, 12,7 mil tons being related to Danube ports.

9.3.2 SWOT analysis

Please start with the table, and analyse both local (port) and country-wide aspects here:

Table 21: SWOT matrix for the Port of Constanta

Strengths	Weaknesses
• The use of the corporatized port management model, which allows for development in accordance with market requirements • A port with facilities • Modern facilities for passenger ships • Diverse connections with the hinterland area (road, rail, inland water) • Large depths at operative berths • The existence of competitive port operation terminals for all types of goods • The availability of a wide range of ship and freight services	• Low development of short sea shipping in connection with Constanta • The terminals are not grouped together on specific areas • The difficult organizing system, that requires exiting and entering back the port, through the outside area of the port, which implies more formalities, which are time consuming, between the north and the south port • The lack of a port community-integrated IT system which would allow for the fast and efficient exchange of information

[18] www.constantza-port.ro

• Large number of operative berths, specialized according to the types of cargo • The availability of large storage spaces • Development of publicity and advertising activities at a national and international level • An active member in international and European organizations • The existence of large-scale investments in specialized terminals, mainly for the operation of grains and containers • Experience and appropriate training level for the personnel involved in port operation processes • High capacity for future expansion of the available infrastructure • Future development projects in accordance with the needs of the port and its hinterland are defined by means of a master plan • Security systems are implemented for fighting terrorism (i.e. ISPS System) •	between the companies and the public and private sectors • The lack of a coherent port community, capable to answer promptly to the market request • The lack of logistics centres in the port area
Opportunities	**Threats**
• Port location on the Silk Road - Europe - Asia Freight Route • Location at the Danube estuary mouth into the Black Sea • Location on a major European transport corridor • Development of an energy hub for the region • Existence of European funds for the development of transport infrastructure • Regional European policies regarding the Danube and Black Sea.	• High delays in the development of the road infrastructure in Romania • Insufficient attractiveness level to invest in Romania • Restrictions triggered by the access to the Black Sea through the Bosphorus Strait • Additional costs generated by the transit of the Danube-Black Sea Canal • Low levels of Danube waters during periods of drought

	• Navigation restrictions on the Danube during the periods with negative temperatures • Low predictability legal and economic framework • Recent investments in the other ports of the Black Sea • The geopolitical situation in the Black Sea.

(Source: MPAC)

9.3.2.1 Strengths

a. Corporatized port

On November 30, 2011 Emergency Ordinance no. 109 on Corporate Governance of Public Enterprises, subsequently amended by Ordinances no. 26, 29, 51 of 2013 and no. 2, 10 of 2015, was adopted in Romania, being then approved by Law no. 111 of 2016.

By implementing these regulations, all national companies having port management as their main activity have adopted a corporate management.

This decision was due to the intention to create legislative and administrative conditions to increase the efficiency of the economic operators in which the state already holds full or majority shares.

In a study regarding port management models implemented in Romania, which was carried out as part of the DAPhNE project, the following strengths of this management model were identified:

- Competitiveness of services being provided by private companies
- Flexibility in superstructure investments for private operators
- Availability of structured marketing at port level coordinated by port administration
- Mixed private-public orientation
- Agility – high level of market orientation
- Stability of commercial relationships with supply chain stakeholders.

b. Port with facilities

Ordinance no. 131 of 31 August 2000 on the establishment of measures to facilitate the exploitation of ports adopted a series of measures designed to simplify formalities and to facilitate traffic in the Port of Constanta. These include aspects such as:

- No customs declarations shall be filed for foreign goods entering a port or for those already in the port and leaving the country.
- For foreign goods in the port that are to be introduced in the country, customs declarations shall be submitted according to the regulations in force.
- For the Romanian goods, which are introduced into the port and are destined for export, consumption or use in such ports, simplified operative records are drawn up, established by the customs authority. These goods may be reintroduced in the country after similar simplified registration procedures have been carried out.
- For foreign goods in port and placed under a suspensive customs regime, as well as for their transshipment from one mode of transport to another, the customs authority shall not require the lodging of guarantees proving the collection of the import royalties that might be due.
- The following are exempted from payment of import royalties: machinery, equipment, work equipment and installations, traffic management and control facilities, installations used for navigation safety and environmental protection, measuring control and adjustment devices, means of transport with the exception of cars and related spare parts for exclusive use in port by the port authority and by those port operators providing the following port services:
    - loading, unloading, storing, stowing, mooring and sorting;
    - marking and other cargo-related services;
    - palletizing, packaging, containerization, cargo bagging;
    - cleaning of barns and cargo holds;
    - cleaning and degassing of tanks;
    - navigation safety, environmental protection and fire prevention and fire-fighting services.

c. Passenger terminal

Located very close to the historical area of Constanta and the “Tomis” Marina, the passenger terminal has an operating capacity of 100,000 passengers per year, being a recent investment designed to increase the attractiveness of the Romanian seaside.

The Port of Constanta now offers the optimal conditions for the mooring of river cruise ships as well as sea-going passenger ships, with the now available depths at the new terminal facilitating this.

For reasons related to the geostrategic situation in the Black Sea, the number of passenger ships that have visited the port of Constanta has decreased drastically, although an exponential increase had been estimated. However, the number of river passenger ships sailing on the Danube River to Constanta has not been affected, with 17 port calls of this kind being planned for 2018.

d. Hinterland connections

The port has connections with the Central and Eastern European countries through rail and road, and Rhine – Danube Corridor (inland waterway), to which it is linked by the Danube-Black Sea Canal.

The rail network in the Port of Constanta is connected to the Romanian and European rail network.

Constanta Port North has a complex railway system, which has been designed to bear the largest part of the port cargo; only a small percentage was foreseen for road transportation. In this area of the port, the railway traffic has decreased since the 1990's and many operators preferring road transportation by trucks.

In the Port of Constanta South, the railway network hasn't been finished. Nevertheless, from the feasibility studies made for the south side of the port, it is to be seen that railway traffic is increasing. Because of this, MPAC is undertaking extension and modernization works for the lines in the south side of Constanta Port, where the majority of the lines are under the administration ownership of MPAC. The total length of railways in the port amounts to 300 km.

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

The canal branch has a length of 64.4 km and connects the river Danube with the Port of Constanta. The southern branch, which is also the main one, runs from Cernavodă, on the Danube (km 300), to Constanta. The major opportunity offered by the Danube is made up of dry and liquid bulk cargo transport between land-locked countries on the Danube, namely Serbia, Hungary, Slovakia, Bulgaria, Austria and the Black Sea.

The access to the port and the internal road network were designed before 1989 and were linked to the city road network, on which heavy traffic was allowed. The total length of roads

in the port amounts to 100 km. The highway A2 connects Port of Constanta with national road network.

The Port of Constanta is connected by means of pipelines with the refinery in Ploiesti.

e. Deep depths

As a sea port, Constanta has deep depths at all operational berths. In the South Port, the deepest operational depths in the Black Sea are recorded, the maximum being 19 m for the operation of floating cranes and 18 m for berth operations (in berths no. 80 and 81).

Due to these depths, the largest ship that entered the Black Sea was operated in 2012, i.e. the bulk carrier Hebei Success with a 322 m LOA, 58 m height and a deadweight capacity of 233,592 dwt.

The passage of this ship through the Bosphorus Strait was an exception that involved a series of additional safety measures and additional costs, given the 300-meter length limit for transiting ships.

f. Terminals for all kinds of cargo

The Port of Constanta is a container hub and is the most important container terminal in the Black Sea with a throughput capacity of 1.5 million TEU/year.

Port service time is 56 hours per week. Considering the average number of non-operational days due to adverse weather conditions such as: rain, fog and heavy storm the number of weather working days (WWD) varies between 330 and 350 per year.

The Port of Constanta area is utilized through a total of 21 terminals for commercial cargo handling operations.

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

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

The break-bulk (general) cargo is operated by eight terminals. All range of services for general cargo are efficiently provided by stevedoring companies. Food, beverages and tobacco, paper

and cardboard, cellulose, rolled metals, machine parts, bagged cement and other break bulk cargo can be handled.

The Port of Constanta has four terminals for oil/chemical/gas. The main liquid bulk cargoes are represented by crude oil and oil products. The Port of Constanta has a specialised terminal for the import of crude oil and other oil products and for the export of refined oil products, oil derivatives and other liquid chemical products. The oil terminal is equipped with a modern and efficient fire and pollution fighting facilities.

The Port of Constanta has two Ro-Ro terminals equipped with two ramps to handle any type of vehicle and Ro-Ro cargo: the car terminal and the Ro-Ro Ferry terminal. There is not a fully dedicated terminal for cars and currently, the main car operator splits its activity in two berths.

The Ferry-Boat terminal offers exceptional facilities for the freight loaded in wagons, containers, and trucks and transported by ferry vessels and liner services on the Black Sea. There is suitable equipment for loading and unloading trains using the normal European railway standard. The terminal has five rail tracks for vessel boarding and the wagons are operated using ship gear. For the time being, no regular Ro-Ro Ferry line is established.

Every quay-side container terminal that operates in the Port of Constanta has rail access.

The port of Constanta has no bi-modal terminals separated for rail-road within the port area. The port is an important node in integrated logistics chains, offering through the five tri-modal terminal quick and safe access to port facilities from an inland transport system including inland water, railway system and road access. Currently there are a limited number of containers moving inland by water freight.

There are eight multipurpose terminals that can accommodate vessels. For oversized and over weighted cargoes in the Port of Constanta, private companies provide heavy lift cranes that facilitate the handling of heavy lift and out-of-gauge loads.

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

Private companies specialized in cargo transhipment are operating in the Port of Constanta. Using specialized equipment for intermodal transport they provide direct transhipment services for bulk and packed/unitized cargo: Sea vessels – barges, Barges – sea vessels, Wagons – barges and/or small sea vessels, Small sea vessels/barges – wagons.

Liquid bulk can also be transhipped into river vessels to various European destinations or carried through pipelines within the domestic hinterland. Pipelines network connects the port with the main refineries in the country thus securing fast transportation.

g. A whole range of ship and cargo services

The large size of the Port of Constanta, the vast number of vessels that moor here annually, and the fact that all kinds of goods are operated here, have led to the development of all ship and cargo services. There are currently more than 1000 companies that are authorized to provide services in the Port of Constanta. These services include:

- ship and cargos services: loading/unloading, ship and cargo agents, inspection and classification societies etc.

-ship service: towage, pilotage, mooring/unmooring, ship repairs, ship supply, etc.

- cargo services: stowage, storage, freight forwarding, container stuffing/unstuffing, land transport etc.

h. A large number of specialized berths

The total length of quay in the port of Constanta amounts to 29,830 m and is exclusively vertical. A length of 3,262 m of quay is undeveloped.

The maximum number of vessels that can be handled at the same time in the Port of Constanta is 96.

The river-maritime area in the Port of Constanta has recently implemented a waiting area for barges, either self-propelled or not. The facilities have the main purpose of providing temporary mooring quays for incoming and outgoing barges and pushers without interfering in transit coming from the Danube-Black Sea channel and other cargo handling operations.

i. Large storage spaces

The area of port platforms sums up to 3,898,325 m^2 providing a large storage capacity.

In the oil terminal a volume of 1,700,000 m^3 can be stored.

Container terminals have more than double operational capacity comparative with the actual traffic (711,339 TEU in 2016), having a storage capacity of 16,000 TEU. The development plans for these terminals are very important. The two terminals operating the Ro-Ro have a storage capacity of 6,600 CEU.

j. Publicity and advertising activities

The Port of Constanta has developed networking events in other ports on the Danube. It is easy to notice the very high growth of grain traffic and the development of business among the port actors from these ports.

Constanta Port Day is the promotion event performed every year in the hinterland of the port. Having an important position for the landlocked countries in Central Europe, the Port of Constanta must have a close cooperation with the transport community in the region in order to meet their requests.

The contact with the local transport community from each country is very important in order to strengthen Constanta Port's position but also to attract new clients and develop its port network by concluding Protocols of Cooperation, having in consideration the participation of port authorities, transport associations (Port of Pancevo, Port of Vukovar, Port of Krems, Port of Budapest, Port of Novi Sad, Port of Belgrade).

We shall point out that these events support all modes of transport, but the main link is considered to be the River Danube, approximately 13 mils. tons river traffic, being operated in the Port of Constanta, and also one argument for our position as *agribulk hub* and probably the most important grains port in Europe.

k. International and European organizations membership

The Maritime Ports Administration Constanta is a member of:

- *ESPO - European Sea Ports Organization*
- *BASPA – Black and Azov Sea Ports Association*
- *BSEC – Organization of The Black Sea Economic Cooperation*
- *MedCruise – The Association of Mediterranean Cruise Ports*

MPAC has signed cooperation protocols with the following ports:

1. *Port of Aktau*, Kazakhstan Republic;
2. *Association of LogisticsCenters from Hungary*;
3. *MierkaDonauhafenKrems*, Austria;
4. *Port of Lattakia*, Syria;
5. *Durres Port Authority*, Albania;
6. *U.N. Ro-Ro Pendik Port*, Turkey;
7. *Port of Rotterdam Authority*, The Netherlands;
8. *State Service of Maritime and River Transportation*, Turkmenistan;
9. *Port of Jebel Ali*, United Arab Emirates;
10. *Batumi Seaport Ltd.*, Georgia;
11. *Poti Seaport Corporation - APM Terminals Poti*, Georgia;
12. *Hungarian Danube Ports Federation* and the *Hungarian National Shipping Federation*;
13. *Port "Danube" Pančevo,* Serbia;
14. *Baja Public Port Ltd.*, Hungary;
15. *DOE Europe SE*, Czech Republic;

16. *Port of Vukovard.o.o.*, Croatia;
17. *Port of Augusta*, Italy;
18. *Port of Baku*, Azerbaijan.

The presence in all of the above-mentioned associations, as well as the protocols concluded with other ports, are prerequisites for the relations development of the Port of Constanta and for the improvement of its transport routes.

l. Investments in specialized terminals

There are some investments already planned by port operators to be developed in the Port of Constanta. These are presented hereunder, some of them being already started.

Fuel terminal to be developed by Minmetal (ADM) at berths 64-66[19]

Based on the anticipated volumes through the terminal and the optimum use of the space available has been based on tanks of 32 m diameter and a maximum height of 20 m.

Gasoline

Gasoline will be received by rail into the storage facility and exported by ship. Phase 1 will include 2 gasoline storage tanks of nominally 12,000 m^3 capacity (32 m diameter x 20m), with future expansion to 4 or 6 tanks total. The tanks will be fitted with internal floating decks. The largest gasoline ship to be loaded will be 35,000 tons which will be carried out in less than 36 hrs, so will be loaded at a rate of 1000 tons/hr (1400 m^3/hr). Main pipe from pumps to ship estimated at 14", with suction line 16" or 18" depending upon pump location.

Receipt from rail will be offloaded at a minimum rate of 360 tons/hr (515 m3/hr). Main pipe from the pumps to the tanks estimated at 10". Local offloading line sizes will depend on detailed arrangements, but will probably consist of 4" offloading hoses from 6 rail cars to a 10" manifold to pump suction, with 6 offloading pumps/stations to cover a 36-railcar train. Pump size will be 250-300 m^3/hr so 2 stations will be connected and offloading at any time, with the 3rd being connected ready for change over once the first is finished.

Throughput is estimated at around 480,000 tons per annum, which equates to 270 rail receipts and around 14 ship exports, depending on ship capacity.

Diesel

Diesel will be received by ship into the storage facility and exported by rail. Phase 1 will include 1 or 2 Diesel storage tanks of nominally 14k m^3 capacity with future expansion to 3 or 4 tanks total. The receipt from ship will be at a rate of approximately 1000 m^3/hr determined

[19] *Feasibility Study for Fuel Terminal in Constanta*, prepared by Stopford for Vadeco SRL, 2/05/2013

by ships pumps. A ship offloading arm will be provided.

Export by rail will be filled at a rate of 500-600 m^3/hr. There will be 6 loading stations each coupled to 6 railcars allowing connection to cover a full 36 railcar train. There will be 3 loading pumps each supplying 250-300 m^3/hr sufficient to fill 6 railcars at a station, with potential to fill 2 stations at a time running 2 pumps, with one spare. There will also be a small 2 bay road loading facility, each bay with 3 loading arms. Loading rates will be limited to 2,200 l/min per arm, 132 m^3/hr each. There will be 2 loading pumps each of 400 m^3/hr and capable of supplying 3 arms, with no additional spare.

Biodiesel

Biodiesel will be received by ship (<13,000 tons capacity) into the storage facility and exported by rail. Phase 1 will include 1 Biodiesel storage tank of nominally 14,000 m^3 capacity with no planned future expansion. Pumps and piping will be shared with the diesel system. The throughput of biodiesel is expected to be in the order of 60,000 tons per annum.

LFO (HFO)

LFO will be received by rail into the storage facility and exported by ship. Phase 1 will include 1 or 2 LFO storage tanks of nominally 14k m3 capacity with future expansion to 3 or 4 tanks total. The receipt from rail will be at a rate of 500 m^3/hr. Export by ship will be filled at a rate of 1,000 m^3/hr. Tanks and pipework will be insulated and heated by steam from an on-site package boiler.

The largest ship to be loaded will be 40,000 tons, which will require 4 storage tanks. Throughput is set at around 360k tons per annum, which equates to 200 rail receipts and around 12 ship exports, depending upon capacity.

Preliminary line sizes are as for gasoline as the rates are similar.

Vegetable oil

Vegetable oil will be received by ship (< 13,000 tons) into the storage facility and exported by rail. Phase 1 will include 1 tank of nominally 14k m^3 capacity with no future expansion planned. The receipts from ship will be at a rate of 1,000 m^3/hr. Export by rail will be filled at a rate of 500 m^3/hr. Tanks will be insulated and heated by steam from a package boiler on site. The throughput of vegetable oil is expected to be in the order of 60,000 tons per annum.

Preliminary pipe lines sizes are as per gasoline as the rates are similar.

Urea Ammonium Nitrate

UAN will be received by rail or barges into the storage facility and exported by ship. Phase 1 will include 4 UAN storage tanks of nominally 14K m^3 capacity, with future expansion possible to 6 tanks total. The tanks will be approximately 14k m^3 (18k tons). The largest UAN ship to be loaded will be 48 k tons, which will be carried out in less than 48 hrs, so will be loaded at a

rate of 1,300 tons/hr (1000 m^3/hr). Receipt from rail will be offloaded at a rate of 650 tons/hr (500 m^3/hr). Receipt from barge will be offloaded at a rate of 1,300 tons/hr (1,000 m^3/hr). The throughput of UAN is expected to be in the order of 800,000 tons per annum, which equates to around 450 rail deliveries or equivalent per annum and export of around 20 ships per annum.

Grain terminal at berth 80 (Comvex)[20]

The Grain Terminal will be located mainly behind the berth no. 80 in the Constanta South port. In this area will be located the storage and reception system from the trucks (laboratory, weighing machines and unloading vats) and the loading / unloading system in / from ships. The surface will have a total of 63,600 sqm and the maximum height is given by the height of the bands above the cells which is 35.0 m.
The warehouse will have maximum theoretical storage capacity of 200,000 tons that consists of 18 cells of 10,000 t each and 8 cells of 2500 t each. The cells are arranged in two rows, 13 cells per row.
The cells will have cylindrical metallic constructions with a "cone" on the high side. The 10,000-ton cells will have a diameter of 27.5m, a cylindrical height of 21.5 m and a total height of 29.0 m, and those having 2,500 t capacity will have a diameter of approx. 13.0 m and 29.0 m height.
The control of the temperature in the cereal cells is provided with temperature sensors.
The shiploaders will have a capacity of 1,200 t/h. The loading area for the ships is a gravitational quay from reinforced concrete and has a foundation depth of 19.0 m.
The other known future investments are:

- Oil and oil products terminal on artificial island – X Tank SRL
- Multifunctional logistic base in Port of Midia – GSP Logistic SA
- New grain terminal – Socep SA
- New storage area for general cargo at berth 44 – Umex SA.

m. Qualified personnel for the operation of port processes

There is skilled labour force involved in port operations, both in the port administration and among port operators or other relevant actors in the port community.

[20] *Grain Terminal at berth no. 80 in Constantza South Port* - documentation for obtaining the environmental agreement, IPTANA SA, January 2015, http://apmct.anpm.ro

In Constanta there are both the Maritime University and the Naval Academy that provide specialists with a high level of training in the field of shipping and port operation.

"Ovidius" University also has shipboard and port equipment departments.

All these institutions, together with vocational education and training providers, are able to provide a large number of specialized personnel for port activities.

n. High capacity of infrastructure development

The Masterplan prepared for the Port Constanta[21] , included a medium and long-term port strategic planning (until the year 2040) under the provision of a continuous port development and efficient use of the existing resources and infrastructure.

The Master plan defined a number of 20 short term development projects, 7 medium term development projects, 2 long term development projects.

The Port of Constanta covers 3,926 ha of which 1,313 ha is land area and the rest of 2,613 ha is water area. The total land area of 1,313 ha is shared between the North Port that occupies a land area of about 495 ha and the South Port with about 818 ha. Another 561 ha are included, according to the masterplan, in development project for short, medium and long-term perspective.

o. The availability of a masterplan

A Masterplan of the Port of Constanta has been carried out recently, which had as a general objective the achievement of short, medium and long-term strategic planning (up to 2020, 2021-2030 and 2031-2040 respectively), under the conditions of providing port development continuity, efficient exploitation of existing resources and infrastructure, targeted towards the real needs of the market, capable of meeting both national and international requirements.

The short, medium and long term strategic objectives included in the Master Plan are:

- Developing the harbour as an efficient, sustainable and safe complex;
- Promoting partnership with customers and developing close relationships with them;
- Developing the entrepreneurial potential of the port;
- Making investments to strengthen the position of the Port of Constanta in the hinterland networks, maritime and port networks and in the regional transport networks;
- Ensuring port accessibility by road, rail and sea;
- Recognition of EU requirements with respect to the civil society, the social environment,

[21]*Master Plan Port of Constanta,* Final report, December 2015 (updated to December 2016), Ernst & Young SRL - INROS LACKNER SE

human resources and the general public and
- Sustainable port development in line with the EU green harbour policy.

Drawing up such a strategic development document gives investors an overview about the development potential and the needs of the Port of Constanta.

p. Security systems

Taking into consideration Regulation (EC) 725/2004 and Directive 65/2005 on port security and the Romanian legislation in the field, including GD 248/2004, GD 876/2007 and OMT 290/2007, all operators managing port facilities in the port of Constanta are certified for maritime security.

Currently, after the end of the second 5-year cycle as of the entry into force of the ISPS Code and Regulation (EC) 725/2004, port operators (through the Recognized Security Organizations) carry out annual Security Assessments, in order to annually confirm the Declaration of Conformity of the port facilities that they manage.

A new security assessment of the Port of Constanta was carried out, which was approved by Order of the Minister of Transport no. 652 of 04.08.2016.

9.3.2.2 Weaknesses

a. Low development of short sea shipping

The short sea shipping and highways of the sea was defined as an innovative method aimed at shifting the increased road traffic to sea transport as an alternative method of transport.

The shifting of cargo to other traffic routes is the result of the improvements made in port services, in the correlation and cooperation between ports and with the further development of inland waterways helping to reduce the road transport on the congested European transport network.

Short sea shipping proved to be a very good alternative to road transport and it is an environmentally accepted service as it gives a contribution to the decongestion of the European highways and to the reduction of air pollution and energy consumption.

The creation of a sea highway network is an excellent support to the short sea shipping. The implementation of sea highways in the European Union provided new opportunities for the regional development, but unfortunately in Black Sea no short sea shipping routes have been developed yet.

b. The terminals in the North Port are not grouped

As described at the beginning of this chapter, the Port of Constanta is divided into the North and the South Port, which include further infrastructure developments and new terminals.

Because of the phased development of the North Port, this has not benefited from strategic planning, with terminals sometimes having the pertaining storage spaces in locations other than those providing access to the operating berths.

The current master plan of the port has taken into account the need to group terminals by their specificity and to join the spaces needed to store the goods until they are taken over by other modes of transport, but so far this has not been achieved.

c. North-South Port system

Although the economic analyses and studies carried out so far have always highlighted the negative role played by the current organization of the Port of Constanta in two areas: North and South, with two separate customs offices, this situation has continued to persist, generating additional administrative procedures and delays of the vessels, associated with additional costs in their operation.

There are often enough situations when ships are in a position to operate at different terminals located in the two areas and have to go through all the formalities as if they were going from one port to another.

d. Port community integrated IT system

The evolving digitization of all economic activity fields has long highlighted the need for an integrated IT system for port communities, meant to enable a dynamic and efficient data exchange between private companies and public authorities.

However, the Port of Constanta does not have such a system, although both port management analyses and many projects implemented in the area, assessing the existing situation, have shown the need for such a system.

e. Port community

Ports that have recorded a dynamic economic development have always relied on a well-structured port community capable of contributing to business development and improving the economic and regulatory environment in the port by means of a proactive participation.

Except for the organisation of port operators' union, there are no relevant evidence of structuring the port community in the Port of Constanta.

Although steps have already been taken in this direction, the development practices of maritime clusters have not yet demonstrated their expected efficiency.

f. Lack of logistics centres in the port area

For a port with the size and the specificity of the Port of Constanta, the presence of logistics distribution centres in its area is more than necessary. However, at present there are no such centres, but only a few unsubstantiated intentions.

9.3.2.3 Opportunities

a. New Silk Road

The Port of Constanta is located at the crossroads of the trade routes linking the markets of the landlocked European countries to Transcaucasus, Central Asia and the Far East.

So far, many of the countries on this route have shown their interest in making significant investments for its development into one of the main cargo transport routes on the East-West route.

b. Location at the Danube estuary mouth into the Black Sea

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

c. Major European transport corridor

As of January 2014, the European Union has a new transport infrastructure policy that connects the continent between East and West, North and South. This policy aims to close the gaps between Member States' transport networks, remove bottlenecks that still hamper the smooth functioning of the internal market and overcome technical barriers such as incompatible standards for railway traffic.

It promotes and strengthens seamless transport chains for passenger and freight, while keeping up with the latest technological trends. This policy is vital for Europe to re-boost its economy and to generate new jobs. The budget of €24.05 billion up to 2020, in combination with funds from other EU sources and the European Investment Bank, should significantly

stimulate investments and ensure a successful implementation of the new infrastructure policy.

The Port of Constanta is located at the end of Rhine-Danube Corridor, one of the core corridors from the European TEN-T transport network.

d. Energetic hub

The location of the Port of Constanta and the development of the new European energy routes give it the chance to develop into an energy hub. A number of projects are planned to be implemented in the near future in order to achieve this important port objective.

e. European and national funds

An estimated EUR 500 billion of financial investment is required for projects necessary for the implementation of the TEN-T in the current EU programming period, 2014 to 2020[22]. By 2030, the completion of the TEN-T Core Network Corridors alone will require approximately EUR 750 billion worth of investments. The largest percentage of this amount will come from the national budgets of Member States. EU grants will form another significant contribution.

Grants continue to play a key role financing the TEN-T, particularly for projects deemed essential to the successful implementation of the network as a whole, but which cannot offer the levels of profitability sought by investors.

The following funding instruments of the EU make financial support available to projects implementing the TEN-T:

1. The Connecting Europe Facility (CEF)
2. The European Fund for Strategic Investment (EFSI)
3. Horizon 2020
4. The European Structural and Investment Funds (ESIFs), including notably:

- The Cohesion Fund (CF)
- The European Regional Development Fund (ERDF)

f. Regional European policies

On 20 January 2011 the European Parliament (EP) adopted a resolution calling for an 'EU Strategy for the Black Sea' to enhance the coherence and visibility of EU action in the region.

[22] https://ec.europa.eu/transport/themes/infrastructure/ten-t-guidelines/project-funding_en

The resolution provided the European Commission and the Union's High Representative for Foreign Affairs and Security Policy with guidance on drafting the strategy. Security, energy and socio-economic development were emphasised, and a separate EU budget line for implementation (which should benefit from 'efficient disbursement methods') was requested.

The European Parliament's call for an EU Black Sea Strategy stemmed from the parliament's reasonable desire to place the Black Sea region on a par with the Baltic Sea and Danube regions[23].

The first EU regional strategy drafted by the Commission concerned the Baltic Sea region. The document enjoyed a strong support from EU Member States situated in the Baltic region and from various regional organisations, including notably the Council of the Baltic Sea States (CBSS).

Another comparable case, the EU's Danube Strategy, is focused on a river basin – not a sea – region, composed of countries which are either EU Member States or aspire to join the EU.

9.3.2.4 Threats

a. *High delays in the development of the infrastructure*

The Port of Constanta is connected to Bucharest by the A2 highway and, through this, by the national highway network. However, it should be noted that in Romania the total highway length is shorter than 750 km, very little in comparison to most European countries, and the development projects, which amount to more than 8,000 kilometres, have been long delayed.

b. *Insufficient attractiveness level to invest*

Although there are favourable conditions for investments in the Constanta Port Area and its hinterland, apparently investors are not attracted to make significant economic development investments in factories producing or assembling consumer goods which would ensure an economic growth in the area and a significant positive evolution of the port traffic.

A number of clear incentive policies for investors could be developed and abided by over a relevant period of time so that, along with an efficient publicity, they may ensure are launch of investments in the area.

[23]GARCÉS de LOS FAYOS, Fernando, *The EU's Black Sea policy: Where do we stand?* – Directorate General for External Policies, Policy Department, September 2013, *www.europarl.europa.eu*

c. Access to the Black Sea

The access of ships to the Black Sea involves the transit of the Bosphorus Strait, which, for reasons of safety, depending on weather conditions, restricts traffic, especially in the case of oil tankers. Such restrictions lead to delays and increased vessel costs.

Transiting the Bosphorus Straits also involves a series of costs that make it less attractive to choose such a route. For example: for cape size ships (over 150,000 DWT) the fees are 31,500 USD and for the Panamax ships (65,000 – 80,000 DWT) - 15,000 USD.

Limiting the maximum length of vessels crossing the Bosphorus Strait to 300 m LOA is another restriction generated by this situation.

d. Transit of the Danube-Black Sea Canal

The access of river vessels to the Port of Constanta is made after the transit of the Danube-Black Sea canal, including 2 locks at the ends of this canal. The necessity of recovering the investment made for the construction of this canal has caused the Romanian authorities to set fees for its transit and for the locking system.

This leads to increased costs and shipping times, which are sometimes likely to weaken the interest in using this transport route.

e. Low levels of Danube waters

Although all the Danube navigation surveys show that during periods of drought there are sectors where the water level is very low, which makes navigation of many of the convoys impossible, this has not yet been solved, but requires high value investments in navigation.

f. Periods of time when the Danube waters are frozen

Another limitation of the navigation periods on the Danube is when, due to low temperatures, the Danube is frozen.

For the goods the delivery term of which is a critical issue, as well as for shipowners, who are exposed to additional risks and costs, periods like this lead to a low level of attractiveness for inland waterway transport.

g. The legal and economic framework

The recent political changes in Romania have led to legislative modifications, many of which also affecting the economic framework, as is the case of the amendment of the Fiscal Code. Such changes often reflect in the evolution of market prices and foreign exchange rates.

Generally, entrepreneurs look for a high predictability level of the legal and economic framework, so that they may establish medium and long-term strategies and partnerships enabling them to work with low profit margins under significant competitive conditions.

h. Investments in other ports of the Black Sea

For a period of time, the Port of Constanta managed to be the most important port in the Black Sea area for several categories of goods, mainly due to relevant investments in terminals such as the container terminal or the grains terminals.

Nevertheless, new investments have been made lately in almost all significant ports in the Black Sea area and developments are being carried on, thus increasing the level of competitiveness in the area.

i. The geopolitical situation in the Black Sea

Since the annexation of Crimea by Russia in 2014, the Black Sea area has changed substantially. A first impact was felt in the traffic decrease of passenger ships, but the shipping routes were also reconsidered.

Even if it is not a war zone, given its significance for the energy routes but also for the transfer of goods between Asia and Europe, the Black Sea continues to be an area carefully analysed by shipowners whenever they consider it in their plans to develop new business relationships.

One of the reasons for the delay in the development of short sea shipping is certainly the existing situation in the Black Sea area.

9.4 Port of Galati SWOT analysis

9.4.1 Introduction

Port of Galati is the largest river and sea port on the Danube and the second largest Romanian port. Located in Galati, between Km 157+600 and Mm 78+1300, the port is an important source of incomes for the city, as it attracted many national and international companies operating here.

The Port of Galati has 4 terminals, one for passenger transport and three for cargo transport. Galati is Romania's second important port, having the possibility to connect to the Black Sea; it is located on the maritime stretch.

Land and infrastructure are owned by the Romanian state and The National Company – Maritime Danube Ports Administration Galati (CN APDM SA Galati) fulfils the function of Port Authority managing the port infrastructure.

The port superstructure of all terminals (cranes, loading / unloading equipment, warehouses, platforms, power and water supply equipment) is entirely owned by private companies, performing port specific activities (loading / unloading of vessels, warehousing of cargo, etc.). The cargo volumes operated during the 2010 -2017 is approximately 35993 thousands of tons summing the solid and liquid bulk cargo (iron ore, coal, coke, cereals, dry timber,) the main freight throughput in port Galati.

In order to fulfil its mission, vision and overall objectives, the Strategic Plan for the Development of Galati Port includes seven strategic development directions at the Port Community level:

- The Management Strategy in relationship with relevant actors,
- Marketing and business Strategy,
- Investment strategy,
- Funding Strategy,
- Organizational Strategy and human resource development,
- Environmental Strategy,
- Support Strategies.

Port Development Directions:

- RO-RO Terminal in Port of Galati: Up-grade the basic port infrastructure, construction of supporting facilities in the port and establishment of intermodal facilities:

- Galati Multimodal Platform / Stage II–Up-grade of the infrastructure for land access to the port of Galati

Objective: Modernization and rehabilitation works which shall be located in the South-East Region of Romania, New Basin area of the port of Galati, as follows:

- ✓ Up-grading the road access between the port and the TEN-T road network, including the construction of a bridge above the railway lines exiting the shunting yard and a roundabout
- ✓ Relocation of a railway line to enable free access from the shunting yard to the other port areas / port operators located downstream of New Basin port area

- Galati Multimodal Platform / Stage III–Development of the multimodal platform for operations and In-Out Gate

Objective: Development of the multimodal platform for operations and In-Out Gate:

- ✓ Multimodal platform for operations
- ✓ Storage and stacking areas

- ✓ Internal roads
- ✓ Internal railway lines
- ✓ Fixed and mobile facilities for operations
- ✓ Terminal Operating System

9.4.2 SWOT analysis

Main aspects of strengths, weaknesses, opportunities and threats are given in below table.

Table 22: SWOT matrix for the Port of Galati

Strengths	Weaknesses
• Maritime and river port • Rail connection: European Standard and Russian Standard • The strategic position at the eastern border of the EU • Located on the Pan – European Corridor VII Rhin – Main – Danube waterway, of the TEN-T network plant • Size of seagoing and river vessels that can moor in the port of Galati • Proximity to Industrial Park and Free Zone • The APDM's proactive management for promoting the development projects of the port of Galati and applying the principle of partnership at the Port Community level • Labour force available in the area • High performance equipment for collecting waste and residues generated by vessels. • The presence of the customs office in the port • Establishment of a cluster in the field of shipping • APDM has the ability to intervene in taking over waste and in case of emergency, including accidental water	• Inefficient and non-adapted port facilities for new cargo flows • Depth limitations at the Sulina Canal entrance • Limitations on conditions of navigation in the common sector Romanian-Bulgarian at certain times of the year • Low capacity to ensure conditions of navigation during the winter • Insufficient dredging system for keeping water depth in the port • High costs for seagoing vessels access in port Galati • Limited supply of logistics services • Insufficient connections to hinterland • Information flow is not computerized at the Port Community level and the automated security and safety systems do not cover all port areas • Burdensome bureaucratic procedures related to customs clearance of cargo and border crossing • Lack of involvement in R&D (research – innovation) activities of the Port Community • Lack of qualified staff and lack of specific regulations regarding training in relevant fields

pollution caused by discharges from industrial activities • Member in international organizations	• The marshalling yards servicing the port area are not included in the administration of APDM • APDM does not have access to the RoRIS system
Opportunities	**Threats**
• Access to non-reimbursable financing • The existence of freight flows with potential to be attracted in the port of Galati • Current favourable geopolitical context as the eastern border stabilization zone of the EU • Membership to the Braila-Galati Urban System and the Lower Danube Euroregion • Exploitation of the opportunities for cooperation with the port of Constanta	• Competition with the Port of Constanta • Strengthening coalitions between ports and increasing competition between sea basins • Decline in industrial production on the region • Upgrading the railway system in Bulgaria • The development of the railway between Turkey and Europe

(Source: APDM)

9.4.2.1 Strengths

a. Maritime and river port

Port Galaţi benefits from the advantage of being both a seaport, with access to the Black Sea through the Sulina Canal and through the Danube - Black Sea Canal, as well as the river port, being located on the maritime sector of the Danube, the largest European river.

The main advantage of a maritime and river port is the fact that it allows both the access of the sea going and the inland waterways vessels, ensuring a faster transfer of cargoes from seagoing vessels to hinterland transport networks.

This avoids the congestion of the transhipment areas in the port, allowing for the efficient deployment of operations. This strong point contributes to turning the Galati port into an important transhipment point for cargoes which move across Asia-Europe, Caspian-Europe and North-South Europe.

b. *Rail connection: European Standard and Russian Standard*

Galati Port is the only South Eastern European port that has both a broad-gauge railway (1520 mm) and normal railway (1435 mm). This is a strategic asset, especially in terms of proximity to countries with broad gauge railways. Taking advantage of this benefit, Galati Port can become an important transit point for goods coming from, destined or transit through countries such as Ukraine and the Republic of Moldova but also Caspian countries. Corroborating this strength with the one presented above, Galati port has the advantage of being a point of connection between two railway systems(1520 mm and 1435 mm), while having direct access to fluvial-maritime and road transport.

c. *The strategic position at the eastern border of the EU*

By strategic location at the eastern border of the European Union and by the two types of railways it benefits, Galati port can be placed on the market as a land and sea entry point in the European Union and can thus attract freight flows between countries from the European Union and the countries of the former Soviet Union and the Caspian Sea area.

d. *Located on the Pan – European Corridor VII Rhin – Main – Danube waterway, of the TEN-T network plant*

The location of the Galati harbour as a maritime and river port on the TEN-T central network on the Rhine-Danube corridor is a significant opportunity since the EU's transport objectives aim at completing the TEN-T corridors by 2030. The membership of the TEN-T central network requires the minimum requirements regarding inland waterway transport infrastructure, port infrastructure and hinterland connections to be met, telematics applications that once implemented will contribute to enhancing the competitiveness of the port. Thus, in the medium term, Galati port will be part of a well-connected network that will allow efficient freight transport and can benefit from non-reimbursable funding through programs funded by European funds.

e. *Size of seagoing and river vessels that can moor in the port of Galati*

Taking into account the existing depths at the operating berths in Galati port, any type of river vessel can be moored in the port, while seagoing vessels that can be moored can have a capacity of up to 15.000tdw.

There is, however, a limitation of the size of the seagoing vessels that can access the port given by the depth at the Sulina Canal (the maximum draft of the sea-going vessels that can pass the Sulina Canal is 7.32 m)

f. *Proximity to Industrial Park and Free Zone*

The two areas are intended for the development of production activities and services, respectively activities related to the shipping sector, specific activities of a "dry port" and the standard activities of a terminal.

The existence of the Free Zone that offering tax relief can be an important factor in the development of production activities in the Galati port area given the circumstances that the customs duties and VAT are exempt from payment for cargoes imported into Galati Free Zone for processing, storage or trading.

g. The APDM's proactive management for promoting the development projects of the port of Galati and applying the principle of partnership at the Port Community level

The high level of involvement of APDM management in various development programs as well as in the active promotion of the harbour represents another strong point of the port of Galati. It helps identify new opportunities and create new collaborative relationships that may be beneficial to the port.

In addition, the APDM organizes quarterly working meetings with operators involved in port activity to discuss potential port development opportunities.

By the end of March 2020, the first round of the European project "Multimodal Galati Platform - Removing major bottlenecks by modernizing the existing infrastructure and ensuring the missing connections for the Rhin-Danube / Alps Central Network", will be completed in Port Bazinul Nou, consisting in modernizing the infrastructure port.

In essence, the planned works were to be carried out for three years and eight months consisting of a 8568-meter-long quay, dredging works in the Port Bazinul Nou, partial filling of the basin to create additional berth and levelling elevation profile in platforms. These works, commonly referred to as "port infrastructure upgrading", are only one of the four objectives of the General Project "Multimodal Platform Galati".

The project, with a total value of approximately EUR 80 million, provides for the realization within 10 years of a multimodal platform in Galati port, an objective that could lead to the creation of a minimum of 50,000 new jobs, but also to the establishment, in Galați, various economic activities (from services to industry and production in the Free Zone or Industrial Park)

h. Labour force available in the area

The available labour force is currently a competitive advantage of the entire country and implicitly of the south-eastern region, which contributes to the attractiveness for investors.

At present, Romania came second to last in terms of average labour costs per hour of EU Member States.

i. High performance equipment for collecting waste and residues generated by vessels

The existence of high performance facilities for the collection of waste and residues generated by the vessels is an important element in ensuring the sustainability of port activities.

Also, the fact that these facilities are assured in Galaţi port contributes to ensuring the safety of navigation by preventing the incidents that may occur if the waste blocks the propulsion equipment of the vessels in port.

j. The presence of the customs office in the port

The existence of the customs point in the port reduces the time for possible journeys to a customs office located at a greater distance from the port, which would involve additional costs.

j. Establishment of a cluster in the field of shipping

In order to ensure a unified framework of cooperation between the members of the port community and for the accomplishment of missions / objectives of common interest, a protocol of collaboration between a part of the community members was concluded for the establishment of the cluster for the ecologically intermodal transport of goods " Romanian River Transport ".

The cluster aims to:

- Identify and promote a range of investment projects, both public and private, as well as proposals to amend / improve strategies, policies and action plans in infrastructure / superstructure, operational / operational processes, ICT, equation, stand-by

- Strengthen cooperation between the different actors in the river ecological transport sector by intensifying contacts, exchanging information and ideas, and conducting joint activities

- Promote innovation and entrepreneurship in the river ecological transport sector.

k. APDM has the ability to intervene in taking over waste and in case of emergency, including accidental water pollution caused by discharges from industrial activities

The APDM can manage and provide waste collection services to vessels and in other smaller ports whether or not under the management of the company (Hârşova, Măcin, Isaccea, Mahmudia, Chilia Veche, Sulina) where the investment in fixed facilities would not be justified due to low traffic volumes.

9.4.2.2 Weaknesses

a. Inefficient and non-adapted port facilities for new cargo flows

The Mineral Port (in which approximately 80% of the traffic flowing through the port of Galati is operated) was designed to serve the steel industry with port facilities being so adapted to the transport of raw materials and bulk cargo.

Given the historical decreasing trends in the activity volume of the steel industry, Galaţi port was forced to reorient to the service of other types of goods.

However, the analysis of infrastructure and superstructure in Galați port has highlighted that existing port facilities, although functional, do not support the operation of the new types of goods under efficient conditions.

Considering the fact that the operational efficiency is one of the key factors determining the decision to select a port in the logistics chain, this may have an adverse impact on the freight traffic volume that can be attracted, especially in the long run.

b. *Depth limitations at the Sulina Canal entrance*

At present, the minimum depth at the Sulina Canal does not allow the access of sea-going vessels with drafts over 7.32 m in the port of Galati. If this were to be remedied, Galati could receive ships of up to about 15.000 dwt because it has the depths required to moor them (maximum 8,4 meters deep).

This limitation is even more important as one of the current trends in the shipbuilding industry is the design and construction of 8m fish feeders. These types of ships could become in perspective, the most important category of port customers.

c. *Limitations on conditions of navigation in the common sector Romanian-Bulgarian at certain times of the year*

The Romanian-Bulgarian Danube Joint Sector is characterized by large variations in water flows and water levels during the year, which makes critical shipping points due to shoreline erosion and alluvial transport appear in some sectors.

The average number of days that the navigation conditions are ensured is up to 280 days / year.

d. *Low capacity to ensure conditions of navigation during the winter*

At present, the APDM does not have an icebreaker or other means to ensure continuous navigation conditions during the winter. The conditions of winter navigation in freezing situations on the Danube are ensured by a winter command set up and monitored by the Ministry of Transport, a headquarters where organizations with specialized ships are co-opted to ensure the continuity of the shipping.

e. *Insufficient dredging system for keeping water depth in the port*

At present, the dredging maintenance works and other hydro-technical works carried out by APDM are entirely financed from their own sources, being not subsidized from the state budget.

The works are carried out according to the annual maintenance programs based on historical data on port traffic by subcontracting services from a few specialized suppliers to the market. Thus, the current system allows for the provision of adequate mooring and port handling conditions only for trafficked berths. This affects the use of other areas in the port where additional freight flows could be handled, with a negative impact on port competitiveness.

f. High costs for seagoing vessels access in port Galati

The access of seagoing vessels to Galaţi harbour implies a number of additional costs induced mainly by the location of the Galati port at a distance of 80 nautical miles from the Danube to the Black Sea (on the Sulina Canal).

For example, the total cost of mooring a seagoing ship in Galaţi port besides Constanţa port includes additional costs for transiting Sulina Canal and compulsory boarding in Sulina port in order to control border crossing and tonnage measurements (even if the final destination is the port of Galati) such as: taxes to ANR Sulina, pilotage tariffs for channel transit and pilotage tariff in the port of Sulina, landing tariffs and agency tariffs in Sulina port.

Thus, the total costs for ship's access and mooring in Galaţi port are significant higher than the nearest port of the Black Sea (Port of Constanta).

g. Limited supply of logistics services

At present Galati port does not provide logistical services such as quality control, repackaging, customization, assembly, testing, repair and reuse, etc., which would add value and generate additional revenue.

h. Insufficient connections to hinterland

At present, rail and road connections to the hinterland do not comply with the requirements of Regulation 1315/2013 and the Rhine-Danube Corridor Study. The lack of adequate hinterland connections leads to increased transport costs for goods that could be transported through the port of Galati, thus reducing the attractiveness of the port. Although the port benefits from a strategic geographic position, the lack of efficient hinterland connections can cancel this advantage.

i. Information flow is not computerized at the Port Community level and the automated security and safety systems do not cover all port areas

In terms of port-based IT systems, the most relevant at present can be the Port Community System type used by major ports in the world.

These systems connect all the economic agents involved in the port activity (operators, charterers, ship agents, etc.) and authorities (Customs, Border Police, Port Captain). The systems are designed based on optimized processes and simplified and uniform procedures, thus enabling the integration and automation of Information flows.

They help improve performance, increase efficiency (time, resources), but also to better communication between all parties involved. Another benefit associated with these systems is that they allow the collection of detailed freight traffic statistics that are essential for optimal business planning.

j. Burdensome bureaucratic procedures related to customs clearance of cargo and border crossing

Carrying out customs formalities, especially the processing of customs declarations, poses a threat to the development of existing traffic and to the attraction of new goods flows to the port of Galati due to the time required and the high administrative burden induced by the procedures applied.

k. Lack of involvement in R&D (research – innovation) activities of the Port Community

The Port Community is not involved in research and innovation activities and has so far not cooperated with higher education institutions, which limits the opportunities for sustainable and smart development

l. Lack of qualified staff and lack of specific regulations regarding training in relevant fields

The main problems faced by the Port Community in attracting qualified personnel in logistics and port activities are the lack of regulatory and occupational standards and the lack of relevant education and training programs.

At this time, the requirements on staff competencies (both operational and administrative) that carry out port activities are insufficiently defined. In addition, most port occupations are not included in the Romanian Occupation Classification (COR).

At the same time, the offer of training services for the personnel in the field of port activities and logistics is insufficient, both in terms of volume and diversity.

l. The marshalling yards servicing the port area are not included in the administration of APDM

The marshalling yards that serve the port of Galati are currently managed by the National Railway Company(CFR), this are not properly maintained and do not allow the operation of trains with740 meters long as required by the European regulations.

m. APDM does not have access to the RoRIS system

APDM cannot access the RoRIS system, which prevents the effective exchange of information with supervisory and control organizations, involves additional time to collect necessary data from port customers and prevents the implementation of customer-quality objectives.

9.4.2.3 Opportunities

a. Access to non-reimbursable financing

Galati Port is located on the TEN-T Central Network, which gives it the opportunity to access non-refundable funding in several European programs managed at national and European level.

These benefits should be harnessed to support the efficiency and increase of the market share of inland waterway transport in line with EU policies to promote sustainable modes of transport

b. The existence of freight flows with potential to be attracted in the port of Galati

A series of freight flows that could be attracted to Galati Port have been identified in the Traffic Survey.

Also, given the return to the pre-crisis levels of the annual traffic experienced at the level of ports in the region and the generally positive trend in maritime freight transport, it can be concluded that Galati port can access growing markets by creating strategic partnerships with integrated logistics providers. The main routes and types of goods identified that can be attracted by the port of Galati:

- China - Europe: Finished products, machinery, equipment.

- Western Europe - Eastern Europe: Finished products, machinery, equipment, food, chemicals

- Europe - Caspian: ores, metal waste, food, finished products, machinery

- The Black Sea - the Baltic Sea (especially the relationship with Poland): finished products, machinery, solid mineral fuels, agricultural products, fertilizers

c. Current favourable geopolitical context as the eastern border stabilization zone of the EU

Romania, located at the eastern border of the European Union, is a country with a stable political and legislative environment with little potential for conflict, which is an opportunity to transport goods to / disregard neighbouring non-EU countries.

d. Membership to the Braila-Galati Urban System and the Lower Danube Euroregion

Steps have been taken to develop two sustainable development strategies for the two systems/regions, namely the Integrated Sustainable Development Strategy of the Lower Danube Euroregion and the Integrated Sustainable Development Strategy of the Braila-Galati Urban System

e. Exploitation of the opportunities for cooperation with the port of Constanta

Given the natural characteristics of the two ports and the development of shipping to increasingly larger vessels, there is an opportunity to initiate a collaboration between the Galaţi and Constanţa ports on different market segments.

Thus, with deep depths of up to -19 m, Constanta can focus on large and very large vessels that generate efficiencies from economies of scale, while Galaţi can receive smaller vessels.

Such a sustained policy at the level of the Ministry of Transport would also generate benefits for both ports, in line with the "competition through cooperation" development trends that are encouraged at the level of the European Union.

A successful example is the NAPA, the Northern Adriatic Ports Association, consisting of the ports of Venice, Koper, Rijeka, Trieste. The four ports are coordinating for the development of services in a complementary way that provides benefits for each involved party and makes joint efforts to develop infrastructure, harmonize procedures and promote.

f. Member in international organizations

APDM is member in: EFIP (European Federation of Inland Ports) and ESPO (European Sea Ports Organization)

9.4.2.4 Threats

a. Competition with the Port of Constanta

Port of Constanta is one of the main competitors on the segment of draft vessels up to 7.5 m, which has taken over the last few years some of the freight traffic in Gala port. Thus, while both ports share the same hinterland, Constanta harbour is better connected and benefits from modern operating facilities. Also, the depths of the port basins are higher, which allows transport on large vessels and, implicitly, reduction of transport costs. Constanta Harbour Master Plan provides infrastructure investments in grain terminals, RoRo, containers and passengers, as well as works to modernize the port infrastructure and the road and rail network in the port, which will contribute to increasing the capacity and operational efficiency.

b. *Strengthening coalitions between ports and increasing competition between sea basins*

The development of competing ports in the Black Sea as well as in the Adriatic Sea is a threat, particularly as the infrastructure, superstructure and Galati Port connections with the hinterland will not be significantly improved.

Without these investments and taking into account an accelerated pace of development of competing ports, the attractiveness of Galati port could continue to decline.

c. *Decline in industrial production on the region*

Given that most of the goods transited through Galati port come from the industrial activities carried out in the municipality (the Arcelor Mittal steel plant), the decrease of the production activity will lead to a considerable decrease of the traffic through the port.

d. *Upgrading the railway system in Bulgaria*

The Bulgarian National Railway Infrastructure Company has requested a loan from the World Bank for the financing of the Railway Infrastructure Rehabilitation Project, which aims to improve the quality and efficiency of the railway infrastructure services in Bulgaria.

This will be done through an investment program that aims firstly to stop the deterioration and to modernize the situation of the railway infrastructure assets on the selected lines on the Bulgarian central railway network.

Also, 70% of the total budget of the Transport and Transport Infrastructure Program 2014-2020 in Bulgaria (1.9 billion) was allocated for the modernization of the road and railway infrastructure.

e. *The development of the railway between Turkey and Europe*

Turkey inaugurated in 2013 in Istanbul the submarine railway tunnel connecting Europe to Asia via the Bosphorus Strait.

Once the use of the tunnel has started and for rail transport, some of the goods transported on other transport routes (road and sea) will be moved to the train. At the moment, there is no decision on this or a time horizon in which freight will be opened through the tunnel.

9.5 Port of Braila SWOT analysis

9.5.1 Introduction

Port of Braila is one of the largest Romanian river ports. Located in Braila city on the Danube, from 165 km to 175 km – left arm and 4 km. on the Măcin Arm, the port is an important source of incomes for the city, because many large international companies are operating here.

Land and port infrastructure are owned by the Romanian State and The National Company – Maritime Danube Ports Administration Galati (CN APDM SA Galati) fulfils the function of Port Authority managing the port infrastructure.

The port superstructure of all terminals (cranes, loading / unloading equipment, warehouses, platforms, power and water supply equipment) is entirely owned by private companies, performing port specific activities (loading / unloading of vessels, warehousing of cargo, etc.).

The cargo volumes operated during the 2010 – 2017 is approximately 18.547 thousands of tons summing the solid and liquid bulk cargo (cereals, mineral products, wood products, seeds, oils, fats, natural and chemical fertilizers) the main freight throughput in port Braila.

In order to fulfill its mission, vision and overall objectives, the Strategic Plan for the Development of Braila Port includes seven strategic development directions at the Port Community level:

- The Management Strategy in relationship with relevant actors
- Marketing and Business Strategy
- Investment Strategy
- Funding Strategy
- Organizational Strategy and Human Resources Development
- Environmental Strategy
- Support Strategies.

Port Development Directions / Projects:

Development of Braila Port

Objective: Analysis of the current situation and elaborating a Strategic Development Programme related to Braila Port in order to generally increase the attractiveness of the port area, to support further investments [including in infra- and super-structure] and to add more facilities offered to the customers.

9.5.2 SWOT analysis

The main results of internal and external diagnosis are presented in the below table:

Table 23: SWOT matrix for the Port of Braila

Strengths	Weaknesses
• Ability to receive river and seagoing vessels • Efficient administration, with investment capacity, proactive management • The strategic position at the eastern border of the EU • Located on the Priority Axis 18 Rhin-Main-Danube, the extended TEN-T network • Advantage over Galati port in manipulation of cereals • Rail connection: European Standard and Russian Standard • Medium technical equipment • Labour force available in the area • Membership in a naval Cluster	• Limitation of seagoing vessels is conditioned by the Sulina Canal entrance • Old Mooring Infrastructure • Operating technologies not adapted to new cargoes flows • Seasonal lacking of navigational conditions • Limited supply of logistics services • Insufficient connections to hinterland • The marshalling yards servicing the port area are not included in the administration of APDM • Burden of some bureaucratic procedures related to customs clearance of cargo and border crossing • High costs for seagoing vessels • Lack of involvement in R&D (research – innovation) activities of the Port Community
Opportunities	**Threats**
• Access to non-reimbursable financing • Freight flows with potential to be attracted • Membership of the Lower Danube Euroregion • Opportunities for cooperation with Constanta port	• Cereals high competition with all Danube ports • Decline in industrial production on the region • Critical conditions of navigation on the Lower Danube, and on the River Danube • Upgrading the railway and road in Ruse port – Bulgaria • The bridge over the Danube will reduce the activity of ferry

	• Competition with other ports • Lack of preparation for severe climate change

(Source: APDM)

9.5.2.1 Strengths

a. *The ability to receive river and seagoing vessels*

Berths can receive any type of cargo or passenger vessels. Seagoing vessels are limited to a maximum of 8,800dwt or 15,000 dwt partially loaded. The limit is given by the maximum depth provided at the Sulina Canal entrance.

The port is maritime, with access to the Black Sea through the Sulina and the Danube - Black Sea channel, being located on the Danube maritime and river sector. The port transhipps for the Asia-Europe and Caspian routes.

b. *Efficient administration, with investment capacity, proactive management*

The high level of involvement of APDM management in various development programs as well as in the active promotion of the harbour. There is some ongoing project for developing the infrastructure on Braila Port. (The Development of Braila Port)

c. *The strategic position at the eastern border of the EU*

With the strategic location of the eastern border of the European Union, the Port can be positioned on the market as a land and sea entry point in the EU and can thus attract freight flows transported between EU countries and the former Soviet Union countries and the Caspian Sea area.

d. *Located on the Priority Axis 18 Rhin-Main-Danube, the extended TEN-T network:*

The membership of the TEN-T central network requires the minimum requirements regarding inland waterway transport infrastructure, port infrastructure and hinterland connections to be met, telematics applications that once implemented will contribute to enhancing the competitiveness of the port. Thus, in the medium term, Braila port will be part of a well-connected network that will allow efficient freight transport and can benefit from non-reimbursable funding through programs funded by European funds.

e. *Advantage over Galati port in manipulation of cereals*

Braila is already a development economic pole with a positive trend in this sector being located in the cereal basin.

f. *Rail connection: European Standard and Russian Standard*

Taking advantage of this benefit Braila Port can become an important transit point for goods coming from, destined or transit through countries such as Ukraine and the Republic of Moldova but also Caspian countries

g. *Medium technical equipment*

The technical facilities are at an average level in terms of number of machines and capacities.

h. *labour force available in the area*

The available labour force currently represents a competitive advantage of the entire implicit country of the south-eastern region, which contributes to the increase of the attractivity for the investors. Existence of specialized personnel to operate the quay and platform (in the warehouses).

i. *Membership in a naval Cluster*

In order to ensure a unified framework of cooperation between the members of the port community and for the accomplishment of missions / objectives of common interest, a protocol of collaboration between a part of the community members was concluded for the establishment of the cluster for the ecologically intermodal transport of goods " Romanian River Transport.

9.5.2.2 Weaknesses

a. *The limitation of seagoing vessels is conditioned by the Sulina Canal entrance:*

The minimum depth provided by Sulina Canal entrance is 7.32 m. The passage is limited to vessels of 8,800 dwt max and restricted to 5,000 dwt vessels partially loaded. Modern feeder ships require a draft of 8m.

b. *Damage of Mooring Infrastructure:*

Due to the lack of funds allocated by the Ministry of Transport and the insufficient funds access of European funds has led to the current state of the infrastructure. Currently, procedure is in place to write the application form for POIM funds.

One of the main constraints faced by Port of Braila is related to the port infrastructure that is currently not adapted to the demand. The funding sources for the modernization of port infrastructure to adapt to market requirements on the type of goods and ships are provided only from the state budget and from European non-reimbursable funds.

A problematic aspect in order to ensure the economic feasibility of the APDM investments in the port infrastructure is also the limited involvement of the port operators in carrying out some investment projects that support the increase of the maritime traffic.

Given that cargoes traffic in Braila port has fallen in recent years, the APDM currently provides maintenance and dredging required only for junctions where traffic flows are sufficient to cover expenses. The dredging program for minimal depth is made annually, in consultation with port operators, based on historical traffic flow data.

c. *Operating technologies not adapted to new cargoes flows:*

At present, the vast majority of the quays are sloped quay and the lack of specialized equipment for cargo handling does not allow direct ship-to-shore operations. The inefficient transhipment of goods caused by multiple handling operations with floating cranes and pegged yards impedes the potential development of the ports. Current (obsolete, energy-consuming) equipment, as well as inadequate access to roads, railways and waterways, lead to long handling times and waiting times for entry / exit from the port, especially in the case of higher traffic volumes, thus hampering the ability to deliver a complete and competitive package of services to meet customer expectations

d. *Seasonal lacking seafaring conditions – seasonal (shallows in winter)*

At present, the APDM does not have an icebreaker or other means to ensure continuous navigation conditions during the winter. The conditions of winter navigation in freezing situations on the Danube are ensured by a winter command set up and monitored by the Ministry of Transport, a headquarters where organizations with specialized ships are co-opted to ensure the continuity of the shipping.

e. *Limited supply of logistics services*

At present, at the Braila port level there are no logistic services such as quality control, repackaging, customization, assembly, testing, repair and reuse, etc., services that add value and generate additional income.

f. *Insufficient connections to hinterland:*

Railway and road connections with the hinterland are under the requirements of a port on the TEN-T network presence in Regulation 1315/2013 and studies Corridor Rhine-Danube.

The lack of an appropriate connection leads to an increase in transport costs, thus reducing the level of efficiency. Although the harbour benefits from a strategic geographic position, the lack of efficient hinterland connections can cancel this advantage.

g. *The marshalling yards servicing the port area are not included in the administration of APDM:*

The marshalling yards that serve the port of Braila are currently managed by the National Railway Company(CFR), this are not properly maintained and do not allow the operation of trains with 740 meters long as required by the European regulations.

h. *Burden of some bureaucratic procedures related to customs clearance of cargo and border crossing*

Accomplishment the customs formalities, especially the processing of customs declarations, represents a threat to the development of the existing traffic and attraction of new goods flows to the port of Braila, because of the time needed for the applied procedures.

i. *High costs for seagoing vessels:*

The access of seagoing vessels to Braila harbour implies a number of additional costs induced mainly by the location of the Braila port at a distance from the Danube to the Black Sea (on the Sulina Canal).

For example, the total cost of mooring a seagoing ship in Braila port besides Constanța port includes additional costs for transiting Sulina and compulsory boarding in Sulina port in order to control border crossing and tonnage measurements (even if the final destination is the port of Braila) such as: taxes to ANR Sulina, pilotage tariffs for channel transit and pilotage tariff in the port of Sulina, landing tariffs and agency tariffs in Sulina port.

Thus, the total costs for ship's access and mooring in Braila port are significant higher than the nearest port of the Black Sea (Port of Constanta).

j. *Lack of involvement in R&D (research – innovation) activities of the Port Community*

The Port Community is not involved in research and innovation activities and has so far not cooperated with higher education institutions, which limits the opportunities for sustainable and smart development.

k. *Lack of specific regulations regarding training in relevant fields*

The main problems faced by the Port Community in attracting qualified personnel in logistics and port activities are the lack of regulatory and occupational standards and the lack of relevant education and training programs.

At this time, the requirements on staff competencies (both operational and administrative) that carry out port activities are insufficiently defined. In addition, most port occupations are not included in the Romanian Occupation Classification (COR).

At the same time, the offer of training services for the personnel in the field of port activities and logistics is insufficient, both in terms of volume and diversity.

9.5.2.3 Opportunities

a. *Access to non-reimbursable financing*

Located on the TEN-T Central Network, which gives it the opportunity to access non-refundable funding in several European programs managed at national and European level.

These benefits should be harnessed to support the efficiency and increase of the market share of inland waterway transport in line with EU policies to promote sustainable modes of transport.

b. *Freight flows with potential to be attracted*

A series of freight flows that could be attracted to Braila Port have been identified in the Traffic Survey.

Considering the tendency for recovery after the 2008 economic crisis, emerging markets can be accessed through strategic partnerships with integrated logistics services providers.

The main routes and types of goods identified that can be attracted by the port of Braila:

- China - Europe: Finished products, machinery, equipment.

- Western Europe - Eastern Europe: Finished products, machinery, equipment, food, chemicals

- Europe - Caspian: ores, metal waste, food, finished products, machinery

- The Black Sea - the Baltic Sea (especially the relationship with Poland): finished products, machinery, solid mineral fuels, agricultural products, fertilizers).

c. *Membership of the Lower Danube Euroregion*

Steps have been taken to develop two sustainable development strategies related to the two strategies of the Integrated Sustainable Development Strategy of the Lower Danube

Euroregion and the Integrated Sustainable Development Strategy of the Urban Braila-Galati Urban System.

The project proposals for the elaboration of the two strategies are assumed by the Braila Mayoralty and have been submitted to the Ministry of Regional Development and Public Administration to be included in the Territorial Development Strategy of Romania as programmatic documents containing strategic priorities.

d. Opportunities for cooperation with Constanta port:

Given the natural characteristics of the two ports and the development of shipping to increasingly larger vessels, there is an opportunity to initiate a collaboration between the Braila and Constanţa ports on different market segments. Thus, with deep depths of up to -19 m, Constanta can focus on large and very large vessels that generate efficiencies from economies of scale, while Braila port can receive smaller vessels.

Such a sustained policy at the level of the Ministry of Transport would also generate benefits for both ports, in line with the "competition through cooperation" development trends that are encouraged at the level of the European Union.

A successful example is the NAPA, the Northern Adriatic Ports Association, consisting of the ports of Venice, Koper, Rijeka, Trieste. The four ports are coordinating for the development of services in a complementary way that provides benefits for each involved party and makes joint efforts to develop infrastructure, harmonize procedures and promote.

9.5.2.4 Threats

a. Cereals high competition with all Danube ports

The competition on the cereal IWT transport market is very tough through Danube located ports, mainly because the majority of the cereals goes to Constanta port where larger sea-going vessels are loaded in order to transport this cargo.

Thus, the main advantage of one port over another is the loading services provided by the private port operators.

b. Decline in industrial production on the region

The former industrial plants over Braila – Galati region have now smaller production quantities and some of them had been closed during the last years.

Thus, the raw materials utilized for the production of final products are no longer needed or is needed in smaller quantities.

c. Critical conditions of navigation on the Lower Danube, and on the River Danube

Navigation conditions in the Lower Danube stretches do not fulfil the official technical requirements related to the necessary depths for tug-boats and especially barges and this fact lead to increased costs for the IWT cargo and finally in the reduction of the cargo flows on the Danube, affecting the ports.

d. Upgrading the railway and road in Ruse port – Bulgaria

The railway and the road sector in Bulgaria, starting with the ones linked with the river ports located on the Danube (Ruse) have been upgraded and start to offer good transport conditions for the cargo flows usually transported by IWT, at least for the links inside Bulgaria.

e. The bridge over the Danube will reduce the activity of ferry

The bridge which will be built over the Danube, between Galati town and Braila town will change the cargo flows in the hinterland of these ports, allowing the cargo to be transported fast, on the road, to Constanta Port, using a shorter route.
As well, this bridge will allow the reduction of the transport time and the cost for cars, because they would not wait anymore for the ferries in order to pass them over the Danube, as is the present situation.

f. Competition with other ports

All over the Danube Lower Region, the IWT cargo is more or less the same for all ports located on this area. As well, the distance between the main river and sea-going ports located in the maritime stretch of the Danube (Galati, Braila and Tulcea) is not so long (15 km between Galati and Braila and 80 km between Galati and Tulcea).

Thus, the difference among these ports is to be given only by the port infrastructure and superstructure status and by the port services offered by the private port operators.

g. Lack of preparation for severe climate change

Like mostly all over the Danube region the measures for the preparation for the climate change are not applied at a level which will allow the ports to have commercial and operational advantages over other transport means.

9.6 Port of Tulcea SWOT analysis

9.6.1 Introduction

Port of Tulcea is one of the largest and most important Romanian river ports. Located in the vicinity of Tulcea city, on the right bank of the Danube, between the river kilometres 70,0 and 73,5, including the industrial and commercial sectors.

Tulcea county, covers an area of 198 km, located 125 km away from Constanta, 267 km away from Bucharest (by road) and 71,3 km away from the Black Sea (by waterway).

Tulcea port has vertical quay length of 330 meters and a length of 2225 meters sloped quay. The port has a Ro-Ro river terminal on Tulcea - Reni and return route.

The industrial port of Tulcea is located at km 73.5 on the Danube, built since 1974 in order to provide the necessary raw materials needed for the metallurgical platform in Tulcea. The main activities of the industrial port are:

- unloading imported raw materials such as manganese, lime, quartzite, bauxite, chrome, iron and coke from seagoing vessels;

- unloading of quarry ballast products from barges;

- loading of exported raw materials as ferro, scrap and alumina.

The commercial port of Tulcea serves for passenger traffic in entire Danube Delta area.

Land and port infrastructure are owned by the Romanian State and The National Company – Maritime Danube Ports Administration Galati (CN APDM SA Galati) fulfils the function of Port Authority managing the port infrastructure.

The port superstructure of all terminals (cranes, loading / unloading equipment, warehouses, platforms, power and water supply equipment) is entirely owned by private companies, performing port specific activities (loading / unloading of vessels, warehousing of cargo, etc.).

The cargo volumes operated during the 2010 – 2017 is approximately 17.703 thousands of tons summing the solid cargo (manganese, bauxite, iron ore, limestone, ferroalloys) the main freight throughput in port Tulcea.

Port development directions:

- Development of Tulcea Port (Stage I + Stage II)

Objective: Analysis of the current situation and elaborating a Strategic Development Programme related to Tulcea Port in order to generally increase the attractiveness of the port area and implementing further identified investments [including in infra- and super-structure], planned to add more facilities offered to the customers.

9.6.2 SWOT analysis

The main results of internal and external diagnosis are presented in the below table:

Table 24: SWOT matrix for the Port of Tulcea

Strengths	Weaknesses
• Maritime and river port • The strategic position at the eastern border of the EU • Labour force available in the area • High performance equipment for collecting waste and residues generated by vessels. • The presence of the customs office in the port • MDPA has the ability to intervene in taking overwaste and in case of emergency, including accidental water pollution caused by discharges from activities industrial • Management involvement in development and promotion the active port projects.	• Inefficient and non-adapted port facilities for new cargo flows • Depth limitations at the Sulina Canal entrance • Limits on conditions of navigation in the common sector Romanian-Bulgarian at certain times of the year • Low capacity to ensure conditions of navigation during winter • Insufficient dredging system for keeping water depth in the port • Limited supply of logistics services • Insufficient connections to hinterland • Information flows are not computerized at the Port Community level and the lack of modern security systems in all port areas • Lack of qualified logistics staff and lack of offer of qualifications and training services in logistics and transport • Port cargo traffic is strongly dependent on a limited cargoes category • Lack of port integration on the Rhin-Danube corridor belonging to the European TEN-T network.
Opportunities	**Threats**

• Access to non-reimbursable financing • The existence of cargoes flows with potential to be attracted in the port of Tulcea • Current favourable geopolitical context as the eastern border stabilization zone of the EU • The port is close to a grain region with potential development in the coming period • Development of inland passenger traffic to / from the Danube Delta localities • Port development in correlation with the tourist potential of the area	• The high level of investments made by the Black Sea and Adriatic ports • Strengthening coalitions between ports and increasing competition between sea basins • Decline in industrial production on the region • Lack of involvement in R&D (research – innovation) activities of the Port Community • Failure to access European funds for projects for the development and modernization of port infrastructure

(Source: APDM)

9.6.2.1 Strengths

a. Maritime and river port

Port Tulcea benefits from the advantage of being both a seaport, with access to the Black Sea through the Sulina Canal and through the Danube - Black Sea Canal, as well as the river port, being located on the maritime sector of the Danube, the largest European river.

The main advantage of a maritime and river port is the fact that it allows both the access of the sea going and the inland waterways vessels, ensuring a faster transfer of cargoes from seagoing vessels to hinterland transport networks.

This avoids the congestion of the transhipment areas in the port, allowing for the efficient deployment of operations. This strong point contributes to turning the Tulcea port into an important transhipment point for cargoes which move across Asia-Europe, Caspian-Europe and North-South Europe.

b. The strategic position at the eastern border of the EU

With the strategic location of the eastern border of the European Union, the Port can be positioned on the market as a land and sea entry point in the EU and can thus attract freight flows transported between EU countries and the former Soviet Union countries and the Caspian Sea area.

c. *Labour force available in the area*

The available labour force is currently a competitive advantage of the entire country and implicitly of the south-eastern region, which contributes to the attractiveness for investors.

At present, Romania came second to last in terms of average labour costs per hour of EU Member States.

d. *High performance equipment for collecting waste and residues generated by vessels*

The APDM can manage and provide waste collection services to vessels and in other smaller ports whether or not under the management of the company (Hârşova, Măcin, Isaccea, Mahmudia, Chilia Veche, Sulina) where the investment in fixed facilities would not be justified due to low traffic volumes. Assistance vessel for the transhipment of oil products and for the collection of domestic ship waste.

e. *The presence of the customs office in the port*

The existence of the customs point in the port reduces the time for possible journeys to a customs office located at a greater distance from the port, which would involve additional costs.

f. *MDPA has the ability to intervene in taking over waste and in case of emergency, including accidental water pollution caused by discharges from activities industrial*

Non-propelled vessel used for the collection/treatment/ temporary storage of ship waste and for intervention in case of major oil pollution incidents on the Danube. Multifunctional depollution vessel for the collection of solid and liquid waste and waste from the surface of the water in case of accidental pollution.

g. *Management involvement in development and promotion the active port projects*

Port management and port operations influence and are influenced by stakeholders in the Port Community and beyond. The term "interested actor" can be defined as any person or group of persons who may influence or are influenced by the operations, actions and performance of the port.

As such, the Galati Port Authority should take into account the different interests and strategic objectives of stakeholders, particularly with regard to port development, to ensure an open, integrated port community. Members of the Port Community together with a number of external institutional actors have formalized a collaboration platform in the form of a Romanian River Transport intermodal transport cluster.

Its main objective is to identify and promote a range of joint investment projects, to promote the development of a cluster-oriented industrial policy, to strengthen cooperation between the various players in the river ecological transport sector and to promote innovation and entrepreneurship in sector.

9.6.2.2 Weaknesses

a. Inefficient and non-adapted port facilities for new cargo flows

The Industrial Port (in which approximately 85 % of the traffic flowing through the port of Tulcea is operated) was designed to serve the local industry with port facilities being so adapted to the transport of raw materials and bulk cargo.

Given the historical decreasing trends in the activity volume of the steel industry, Tulcea port was forced to reorient to the service of other types of goods.

However, the analysis of infrastructure and superstructure in Tulcea port has highlighted that existing port facilities, although functional, do not support the operation of the new types of goods under efficient conditions.

Considering the fact that the operational efficiency is one of the key factors determining the decision to select a port in the logistics chain, this may have an adverse impact on the freight traffic volume that can be attracted, especially in the long run.

At present, the vast majority of the quays are sloped quay and the lack of specialized equipment for cargo handling does not allow direct ship-to-shore operations.

The inefficient transhipment of goods caused by multiple handling operations with floating cranes and pegged yards impedes the potential development of the ports.

Current (obsolete, energy-consuming) equipment, as well as inadequate access to roads, railways and waterways, lead to long handling times and waiting times for entry / exit from the port, especially in the case of higher traffic volumes, thus hampering the ability to deliver a complete and competitive package of services to meet customer expectations.

b. Depth limitations at the Sulina Canal entrance

At present, the minimum depth at the Sulina canal does not allow the access of sea-going vessels with drafts over 7.32 m in the port of Tulcea.

If this were to be remedied, Tulcea port could receive ships of up to about 15.000 dwt because it has the depths required to moor them (maximum 8,4 meters deep).

This limitation is even more important as one of the current trends in the shipbuilding industry is the design and construction of 8m fish feeders. These types of ships could become in perspective, the most important category of port customers.

c. *Limits on conditions of navigation in the common sector Romanian-Bulgarian at certain times of the year*

The Romanian-Bulgarian Danube Joint Sector is characterized by large variations in water flows and water levels during the year, which makes critical shipping points due to shoreline erosion and alluvial transport appear in some sectors. The average number of days that the navigation conditions are ensured is up to 280 days/year.

The navigable waterway presents difficult areas for navigation, both in depth and in width, relative to the requirements for the recommended gauge of the navigable canal established by the documents of the Danube Commission.

d. *Low capacity to ensure conditions of navigation during winter*

Due to low temperatures, the Danube is frozen in some winter periods. At present, the APDM does not have an icebreaker or other means to ensure continuous navigation conditions during the winter. The conditions of winter navigation in freezing situations on the Danube are ensured by a winter command set up and monitored by the Ministry of Transport, a headquarters where organizations with specialized ships are co-opted to ensure the continuity of the shipping.

e. *Insufficient dredging system for keeping water depth in the port*

At present, the dredging maintenance works and other hydro-technical works carried out by APDM are entirely financed from their own sources, being not subsidized from the state budget. The works are carried out according to the annual maintenance programs based on historical data on port traffic by subcontracting services from a few specialized suppliers to the market. Thus, the current system allows for the provision of adequate mooring and port handling conditions only for trafficked berths. This affects the use of other areas in the port where additional freight flows could be handled, with a negative impact on port competitiveness.

f. *Limited supply of logistics services*

At present Tulcea port does not provide logistical services such as quality control, repackaging, customization, assembly, testing, repair and reuse, etc., which would add value and generate additional revenue.

g. *Insufficient connections to hinterland*

The lack of adequate hinterland connections leads to increased transport costs for goods that could be transported through the port of Tulcea, thus reducing the attractiveness of the port. Although the port benefits from a strategic geographic position, the lack of efficient hinterland connections can cancel this advantage.

h. *Information flows are not computerized at the Port Community level and the lack of modern security systems in all port areas*

In terms of port-based IT systems, the most relevant at present can be the Port Community System.

These systems connect all the economic agents involved in the port activity (operators, charterers, ship agents, etc.) and authorities (Customs, Border Police, Port Captain).

They help improve performance, increase efficiency (time, resources), but also to better communication between all parties involved. Another benefit associated with these systems is that they allow the collection of detailed freight traffic statistics that are essential for optimal business planning.

i. *Lack of qualified logistics staff and lack of offer of qualifications and training services in logistics and transport*

The main problems faced by the Port Community in attracting qualified personnel in logistics and port activities are the lack of regulatory and occupational standards and the lack of relevant education and training programs.

At this time, the requirements on staff competencies (both operational and administrative) that carry out port activities are insufficiently defined. In addition, most port occupations are not included in the Romanian Occupation Classification (COR).

At the same time, the offer of training services for the personnel in the field of port activities and logistics is insufficient, both in terms of volume and diversity.

j. *Port cargo traffic is strongly dependent on a limited cargoes category*

The Port of Tulcea serves mainly the local industry, so the cargo is very limited (import & export flows).

The main sectors of economic activity are represented by the shipbuilding and repair industry, the metallurgy industry, the construction industry and the woodworking industry.

k. *Lack of port integration on the Rhine-Danube corridor belonging to the European TEN-T network*

Tulcea Port, being located on the Comprehensive TEN-T Network and at the end of Rhine – Danube Corridor, need more than other ports to strongly integrate itself in the IWT transport activities related to this transport corridor.

More than that, Tulcea Port is the entrance gate to the Danube Delta for passengers and leisure vessels navigation on the Danube and need to be much more promoted for cruise tourism and river leisure activities.

Until now, the local and central administration did not take such measures.

9.6.2.3 Opportunities

a. *Access to non-reimbursable financing*

With access to non-refundable funding in several European programs managed at national and European level port of Tulcea can benefit of funds to modernize and increase the quality of inland waterway transport services in line with EU policies to promote sustainable modes of transport.

b. *The existence of cargoes flows with potential to be attracted in the port of Tulcea:*

Construction of a general cargo terminal by upgrading the infrastructure, as well as building berths for the transport of grain on water can attract new flows of cargoes in the area; the transformation of the terminal into one with a capacity to operate will increase the development potential of Tulcea Harbour, but also of the entire area.

c. *Current favourable geopolitical context as the eastern border stabilization zone of the EU:*

Romania, located at the eastern border of the European Union, is a country with a stable political and legislative environment with little potential for conflict, which is an opportunity to transport goods to / disregard neighbouring non-EU countries.

d. *The port is close to a grain region with potential development in the coming period*

Tulcea Port is located in Dobrogea, a Romanian region with high potential and also with high production of cereals. The IWT traffic related to cereals should rise more and more during the next years due to the growing markets in the Black Sea region for these products which will be a supporting factor for the development of Tulcea Port.

More than that, new cereal silos and specific loading / unloading equipment for cereals should be built during the coming years, which will also support all IWT related activities.

e. Development of inland passenger traffic to / from the Danube Delta localities

Tulcea Port is the entrance gate to the Danube Delta, being in the same time the main port used by Danube Delta inhabitants for passenger's transport to / from Danube delta villages.

As well, the port of Tulcea is the main post used by tourists visiting the Danube Delta, as individuals and/or as part of organised groups, using the cruise vessels.

The development of Danube Delta tourism activities will support as well the development of river tourism facilities in the port.

f. Port development in correlation with the tourist potential of the area

Actually, for the development of Tulcea County and of Danube Delta region, central Romanian authorities developed a financing programme using state budget funds but also EU funds, called Territorial Integrated Investments in the Danube Delta Area.

Using this funding programme, the port development should be supported as well, using also other financing sources available, such POIM (Large Infrastructure Operational Programme).

Both these funding programmes, combined with the local and central initiatives related to the tourism activities in the Danube Delta will lead as well to the port development projects and initiatives.

9.6.2.4 Threats

a. The high level of investments made by the Black Sea and Adriatic ports

The infrastructure of the passenger area of Tulcea port belongs to the local authorities and the infrastructure of the commercial area to the National Company – Maritime Danube Ports Administration (APDM). The operations are performed by private operators which do not have access to the necessary funds for investments in the infrastructure and superstructure.

In the last years, no investments were done in the infrastructure, but also in the superstructure.

In the same period, other competing ports located in the Black Sea and Adriatic Sea areas have made significant investments in port infrastructure, equipment and port facilities, which will lead to the attraction of more (private) foreign investments in this sector.

b. *Strengthening coalitions between ports and increasing competition between sea basins*

Being part of organisations related to ports located in the Black Sea and Adriatic Sea areas could be a good point for Tulcea port but unfortunately this is not the case at present. In the same time the most important ports located in the Black Sea and Adriatic Sea areas develop cooperation activities within the existing and/or new developed logistic chains and therefore gain more and more clients, attracting new cargo flows from smaller and not so developed pots located on the same economic areas.

c. *Decline in industrial production on the region*

In recent years important industrial enterprises in Tulcea, some energy-intensive ones, have reduced their activity, leading to a significant decrease in the industrial production of the city.

d. *Lack of involvement in R&D (research – innovation) activities of the Port Community*

The Port Community is not involved in research and innovation activities and has so far not cooperated with higher education institutions, which limits the opportunities for sustainable and smart development.

e. *Failure to access European funds for projects for the development and modernization of port infrastructure*

The port of Tulcea, belonging to the local authorities (partly) and to the National Company – Maritime Danube Ports Administration (APDM) (partly) and is operated by private operators do not have access to the necessary funds for investments in the infrastructure and superstructure.

For infrastructure, the local authorities have set other priorities at Tulcea County level, related mainly to the development of Danube Delta and for superstructure, until now, no public funding is available under POIM for private companies, despite the legal obligation for central authorities to ensure the access of private companies to the EU funds for development of the transport sector.

9.7 Country-wide SWOT analysis of the Romanian port industry

The main results of internal and external diagnosis of the national port industry in Romania are presented in the below table.

Table 25: SWOT matrix for the port industry in Romania

Strengths	Weaknesses
• The use of corporatized port management model, which allows for development in accordance with market requirements • Diverse connections with hinterland area (road, rail) • The availability of a wide range of ship and freight services • An active member in international and European organisations • Conditions for the safe operations of ships • The existence of modern waste reception facilities • Developing partnerships between port operators and the local authorities for port development • Port development projects in progress • Maritime and river ports • Rail connection: both European and Russian standard • Strategic position at the Eastern border of the EU • Located on the Pan-European Corridor VII Rhin – Main – Danube waterway, of the TEN-T network plant • Existence of Free Zone • Proactive management for promoting the development projects and applying	• The lack of a port community-integrated IT system which would allow for the fast and efficient exchange of information between the companies and the public and private sectors • The lack of a coherent port community, capable to answer promptly to the market request • The lack of logistics centres in the port area • The port infrastructure requires significant development investments • Lack of a masterplan for the port development • Limitations on conditions of navigation in the common sector Romanian-Bulgarian at certain times of the year • Limited supply of logistics services • Insufficient connections to hinterland • APDM does not have access to the RoRIS system • Insufficient dredging system for keeping water depth in port

the principle of partnership at the Port Community level	
Opportunities	**Threats**
• Port location on the Silk Road - Europe - Asia Freight Route • Location on a major European transport corridor • Existence of European funds for the development of transport infrastructure • Regional European policies regarding the Danube and Black Sea • Exploitation of the opportunities for cooperation with the port of Constanta	• High delays in the development of the road infrastructure in Romania • Insufficient attractiveness level to invest in Romania • Additional costs generated by the transit of the Danube-Black Sea Canal • Low levels of Danube waters during periods of drought • Navigation restrictions on the Danube during the periods with negative temperatures • Low predictability legal and economic framework • Decline in industrial production on the region • Critical conditions of navigation on the Lower Danube, and on the River Danube • Competition with other ports

(Source: MPAC and APDM)

9.7.1.1 Strengths

a. Corporatized port management

On November 30, 2011 Emergency Ordinance no. 109 on Corporate Governance of Public Enterprises, subsequently amended by Ordinances no. 26, 29, 51 of 2013 and no. 2, 10 of 2015, was adopted in Romania, being then approved by Law no. 111 of 2016.

Having these regulations implemented, all national companies with a port management as their main activity have adopted a corporate management.

The intention was to generate favourable legislative and administrative conditions for an increased efficiency of the economic operators.

b. Hinterland connections

Constanta port has vast connections with the Central and Eastern European countries through rail and road, and Rhine – Danube Corridor (inland waterway), to which it is linked by the Danube-Black Sea Canal. The Danube – Black sea canal is an alternative route from the Black Sea ports to the Danube ports of Central Europe, thus saving about 400 km.

Constanta port rail network is connected to Romanian and European rail network. All port terminals have rail connections.

Constanta port road network is connected through the highway A2 to the national and European road network. The total length of roads in the port amounts to 100 km.

The Port of Constanta has connections also by means of pipelines.

The port of Galati has the advantage of having two railway systems: broad – gauge railway (1520 mm) used in the Moldova, Ukraine and Russian Federation countries and the normal railway (1435 mm) used in European countries.

c. Availability of a wide range of ship and freight services

Constanta Port, the largest Romanian port, with a vast number of vessels that moor here annually and with all kinds of goods operated, has led to the development of all ship and cargo services. There are currently more than 1000 companies that are authorized to provide services in the Port of Constanta. These services include:

- ship and cargos services: loading/unloading, ship and cargo agents, inspection and classification societies etc.

-ship service: towage, pilotage, mooring/unmooring, ship repairs, ship supply, etc.

- cargo services: stowage, storage, freight forwarding, container stuffing/un-stuffing, land transport etc.

d. International and European organizations membership

The Maritime Ports Administration Constanta is a member of different organizations dealing with ports and has signed cooperation protocols with ports from Europe and other continents. the ports situated on the Danube are members of European organizations.

The presence in associations, as well as the protocols concluded with other ports, is prerequisites for the relations development of the Port of Constanta and for the improvement of its transport routes.

e. Safe operation of ships

In Constanta, the Maritime University and the Naval Academy are providing specialists with a high level of training in the field of shipping and port operation. “Ovidius” University also has shipboard and port equipment departments. All these institutions, together with vocational

education and training providers, are able to provide a large number of specialized personnel for port activities.

Port operators take all measures to ensure that ships are operated safely. No accidents on ships or port workers have been recorded in the last period during the operations in the Port of Drobeta-Turnu Severin and Port of Giurgiu.

f. Modern waste reception facilities

Romanian ports provide high performance facilities for the collection of waste and residues generated by the vessels.

During 2012-2015 the ports situated on the Danube River implemented projects related to *receiving and processing of residues from ships and for intervention in case of pollution on the Danube,* financed under POS-T programme. The main objective of the projects was to increase the quality of services for the collection and processing of ship waste and pollution intervention by acquiring ships, installations and equipment, as well as for carrying out the infrastructure works necessary for taking / processing the residues from the river ships.

g. Partnerships between port operators and the local authorities

Romanian ports have managed to involve the local administration in its development. Giurgiu municipality has been involved as a shareholder in the Giurgiu Free Zone Administration, but also as part of the development projects, such as the Project *High Performance Green Port Giurgiu.*

Port management and port operations influence and are influenced by stakeholders in the Port Community and beyond. The term "interested actor" can be defined as any person or group of persons who may influence or are influenced by the operations, actions and performance of the port.

Galati and Constanta Port Administrations take into account the different interests and strategic objectives of stakeholders, particularly with regard to port development, to ensure an open, integrated port community. Members of the Port Community together with a number of external institutional actors have formalized a collaboration platform in the form of a Romanian River Transport intermodal transport cluster.

h. Maritime and river ports

The main advantage of a maritime and river port is the fact that it allows both the access of the sea going and the inland waterways vessels, ensuring a faster transfer of cargoes from seagoing vessels to hinterland transport networks.

Romanian maritime and river ports, Tulcea, Galati and Braila, located on the maritime sector of the Danube, have also access to the Black Sea through Sulina Canal and Danube-Black Sea Canal.

Braila, the furthest port located upriver, can accommodate seagoing vessels up to 8,800 dwt fully loaded or 15,000 dwt partially loaded. This limitation is generated by the restricted depth at Sulina Canal entrance.

i. Rail connection: European Standard and Russian Standard

Galati Port is the only South Eastern European port that has both a broad-gauge railway (1520 mm) and normal railway (1435 mm). This is a strategic asset, especially in terms of proximity to countries with broad gauge railways. Taking advantage of this benefit, Galati Port can become an important transit point for goods coming from, destined or transit through countries such as Ukraine and the Republic of Moldova but also Caspian countries.

Corroborating this strength with the one presented above, Galati port has the advantage of being a point of connection between two railway systems (1520 mm and 1435 mm), while having direct access to fluvial-maritime and road transport.

j. Strategic position at the eastern border of the EU

Considering the geographic position of Romania at the eastern European Union border, its ports are positioned as a land and sea entry point in the EU. This generates freight flows transported between EU countries and the former Soviet Union countries and the Caspian Sea area.

k. Located on the Pan – European Corridor VII Rhin – Main – Danube waterway, of the TEN-T network plant

Most of the Romanian ports are part of TEN-T core and comprehensive network on the Rhine-Danube corridor and this is a significant opportunity since the EU's transport objectives aim at completing the TEN-T corridors by 2030. Also the ports can benefit from non-reimbursable funding through programs funded by European funds.

l. Existence of Free Zone

The legal framework setting up the activity of Free Trade Zones in Romania is represented by Law no.84/1992, concerning the regime of free zones in Romania, the Romanian Government Urgency Ordinance no.31/1997, concerning the regime of foreign investments in Romania and Law no. 332/2001 regarding the promotion of FDI with significant impact on the economy.

The activities which may be carried out within Free Trade Zones are: handling, storing, sorting, measures, packing, conditioning, processing, assembling, manufacturing, testing, auctioning, buying, selling, hiring and concession of land and buildings (concession may be done for a period up to 50 years), the quantitative and qualitative control of goods, surveying, repairing, dismantling, exhibitions, stock's exchange operations, commercial-financial operations, inner or international transports or forwarding, brokerage, agency and ship handling services, as well as other free zones' specific activities. For all of these activities and for the goods entering or leaving the free zone, all documents, requested by Romanian laws in force, are necessary to be issued. All mentioned any natural or legal persons, foreign, might carry out activities or Romanian, on grounds of a license issued by the Free Trade Zone Administration.

The existence of the Free Zone that offering tax relief can be an important factor in the development of production activities in the port area given the circumstances that the customs duties and VAT are exempt from payment for cargoes imported for processing, storage or trading.

Free Zone was established in order to promote international exchanges and to attract foreign capital for the introduction of new technologies, as well as to increase the possibilities of using the resources of the national economy, while both the location and the existence of some users with an extended industrial activity give it a special distinctiveness.

m. *Proactive management for promoting the development projects of the ports and applying the principle of partnership at the Port Community level*

The ports administration management established under corporatized principles organizes working meetings with operators involved in port activity to discuss potential port development opportunities. For the big investments, the port administration signed protocols with private operators in order to develop specialized terminals.

A main objective is to identify and promote a range of joint investment projects, to promote the development of a cluster-oriented industrial policy, to strengthen cooperation between the various players in the river ecological transport sector and to promote innovation and entrepreneurship in sector. Members of the Port Community in Galati together with a number of external institutional actors have formalized a collaboration platform in the form of a Romanian River Transport intermodal transport cluster.

9.7.1.2 Weaknesses

a. *Port community integrated IT system*

The evolving digitization of all economic activity fields has long highlighted the need for an integrated IT system for port communities, meant to enable a dynamic and efficient data exchange between private companies and public authorities.

Information flow in ports is not computerized at the Port Community level that should connect the economic agents involved in the port activity (operators, charterers, ship's agent) and authorities (Customs, Border Police, Port Captain) and the automated security and safety systems.

The ports do not have such a system, although both port management analyses and many projects implemented in the area, assessing the existing situation, have shown the need for such a system.

b. Port community

Ports that have recorded a dynamic economic development have always relied on a well-structured port community capable of contributing to business development and improving the economic and regulatory environment in the port by means of a proactive participation.

Except for the organisation of port operators' union within the Port of Constanta, there are no relevant evidence of structuring the port community.

Although steps have already been taken in this direction, the development practices of maritime clusters have not yet demonstrated their expected efficiency.

c. Port infrastructure

The ports in Romania were build and developed to serve the economy of Romania, centralized until the end of 1989. Since then the economy was changed a lot and not so much investment were done in the infrastructure of ports situated on the Danube. The infrastructure needs upgrades (especially from the sloped quays to vertical ques) and analyses are carried out by the port management for the identification of opportunities and for financing infrastructure projects deemed as significant for the port development.

Given the historical decreasing trends in the activity volume of the steel industry, Galati port was forced to reorient to the service of other types of goods. The analysis of infrastructure and superstructure in Galati port has highlighted that existing port facilities, although functional, do not support the operation of the new types of goods under efficient conditions. One of the main constraints faced by Port of Braila is related to the port infrastructure that is currently not adapted to the demand. A problematic aspect in order to ensure the economic feasibility of the APDM investments in the port infrastructure is also the limited involvement of the port operators in carrying out some investment projects that support the increase of the maritime traffic. The analysis of infrastructure and superstructure in Tulcea port has highlighted that existing port facilities, although functional, do not support the operation of the new types of goods under efficient conditions. At present, the vast majority of the quays are sloped quay

and the lack of specialized equipment for cargo handling does not allow direct ship-to-shore operations.

d. Masterplan

No specific masterplan has been drawn up that clearly highlights the short, medium and long-term development plans, except for the Port of Constanta and the Port of Galati.

e. Limitations on conditions of navigation in the common sector Romanian-Bulgarian at certain times of the year

The Romanian-Bulgarian Danube Joint Sector is characterized by large variations in water flows and water levels during the year, which makes critical shipping points due to shoreline erosion and alluvial transport appear in some sectors.

Conditions for navigation in the Joint Sector are met in about 280 days / year.

f. Limited supply of logistics services

At present Galati, Braila and Tulcea ports do not provide logistical services such as quality control, repackaging, customization, assembly, testing, repair and reuse, etc., which would add value and generate additional revenue.

g. Insufficient connections to hinterland

At present, rail and road connections to the hinterland do not comply with the requirements of Regulation 1315/2013 and the Rhine-Danube Corridor Study. The lack of adequate hinterland connections leads to increased transport costs for goods that could be transported through the port of Galati, thus reducing the attractiveness of the port. Although the port benefits from a strategic geographic position, the lack of efficient hinterland connections can cancel this advantage.

Very similar situation is met in Braila and Tulcea ports, where lack of efficient hinterland can cancel the advantage gained.

h. APDM does not have access to the RoRIS system

APDM cannot access the RoRIS system, which prevents the effective exchange of information with supervisory and control organizations, involves additional time to collect necessary data from port customers and prevents the implementation of customer-quality objectives.

i. Insufficient dredging system for keeping water depth in the port

At present, the dredging maintenance works and other hydro-technical works carried out by APDM are entirely financed from their own sources, being not subsidized from the state budget.

The works are carried out according to the annual maintenance programs based on historical data on port traffic by subcontracting services from a few specialized suppliers to the market. Thus, the current system allows for the provision of adequate mooring and port handling conditions only for trafficked berths. This affects the use of other areas in the port where additional freight flows could be handled, with a negative impact on port competitiveness.

Given that cargoes traffic in Braila port has fallen in recent years, the APDM currently provides maintenance and dredging required only for junctions where traffic flows are sufficient to cover expenses. The dredging program for minimal depth is made annually, in consultation with port operators, based on historical traffic flow data.

At Tulcea port, the works are carried out according to the annual maintenance programs based on historical data on port traffic by subcontracting services from a few specialized suppliers to the market. Thus, the current system allows for the provision of adequate mooring and port handling conditions only for trafficked berths. This affects the use of other areas in the port where additional freight flows could be handled, with a negative impact on port competitiveness.

9.7.1.3 Opportunities

a. New Silk Road

The Port of Constanta is located at the crossroads of the trade routes linking the markets of the landlocked European countries to Transcaucasus, Central Asia and the Far East. So far, many of the countries on this route have shown their interest in making significant investments for its development into one of the main cargo transport routes on the East-West route.

The Port of Constanta is also located at the end of Rhine-Danube Corridor. This Corridor provides the main east–west link between continental European countries, connecting France and Germany, Austria, Slovakia, Hungary, Romania and Bulgaria all along the Main and Danube rivers to the Black Sea by improving (high speed) rail and inland waterway interconnections. The countries that have first been aligned with the project are the Czech Republic and Slovenia.

b. Major European transport corridor

Starting with January 2014, the European Union has a new transport infrastructure policy that connects the continent between East and West, North and South. This policy aims to close the

gaps between Member States' transport networks, remove bottlenecks that still hamper the smooth functioning of the internal market and overcome technical barriers such as incompatible standards for railway traffic.

It promotes and strengthens seamless transport chains for passenger and freight, while keeping up with the latest technological trends. This policy is vital for Europe to re-boost its economy and to generate new jobs.

c. European and national funds

An estimated EUR 500 billion of financial investment is required for projects necessary for the implementation of the TEN-T in the current EU programming period, 2014 to 2020. By 2030, the completion of the TEN-T Core Network Corridors alone will require approximately EUR 750 billion worth of investments. The largest percentage of this amount will come from the national budgets of Member States. EU grants will form another significant contribution.

Grants continue to play a key role financing the TEN-T, particularly for projects deemed essential to the successful implementation of the network as a whole, but which cannot offer the levels of profitability sought by investors.

Transnational cooperation programmes like the *Danube Transnational Programme* (DTP) are funding instruments contributing to the realisation of different EU policies and strategies, including macro-regional strategies. Yet, for either policy or (macro-regional) strategy they are only one instrument among further funding opportunities.

The website *EuroAccess Danube Region* lists the most relevant sources of funding from EU programs in the Danube Region and it provides important information on current calls for project proposals.

In Romania, European funds for development of port infrastructure were available through the Sectoral Operational Programme for Transport for the period 2007 – 2013 (POST 2007 – 2013). For the period 2014 – 2020, European funds for port infrastructure development is available through the Large Infrastructure Operational Programme (POIM 2014 – 2020) and Connecting Europe Facility (CEF).

d. Regional European policies

On 20 January 2011 the European Parliament (EP) adopted a resolution calling for an 'EU Strategy for the Black Sea' to enhance the coherence and visibility of EU action in the region.

The first EU regional strategy drafted by the Commission concerned the Baltic Sea region. The document enjoyed a strong support from EU Member States situated in the Baltic region and from various regional organisations, including notably the Council of the Baltic Sea States (CBSS).

Another comparable case, the EU's Danube Strategy, is focused on a river basin – not a sea – region, composed of countries which are either EU Member States or aspire to join the EU.

The Danube River itself is a major TEN-T Corridor. However, it is used way below its full capacity. Freight transported on the Danube is only 10%-20% of that on the Rhine. As inland waterway transport has important environmental and efficiency benefits, its potential must be sustainable exploited. There is particular need for greater multi-modality, better interconnection with other river basins modernising and extending infrastructure in transport nodes such as inland ports.

e. Exploitation of the opportunities for cooperation with the port of Constanta

Given the natural characteristics of the three ports and the development of shipping to increasingly larger vessels, there is an opportunity to initiate a collaboration between the Galati, Braila and Constanta ports on different market segments.

Thus, with deep depths of up to -19 m, Constanta can focus on large and very large vessels that generate efficiencies from economies of scale, while Galati and Braila can receive smaller vessels.

Such a sustained policy at the level of the Ministry of Transport would also generate benefits for both ports, in line with the "competition through cooperation" development trends that are encouraged at the level of the European Union.

9.7.1.4 Threats

a. High delays in the development of the infrastructure

The Port of Constanta is the only one connected with a highway and through this with the national and European highway network. However, it should be noted that in Romania the total highway length is shorter than 750 km, very little in comparison to most European countries, and the development projects, which amount to more than 8,000 kilometres, have been long delayed. In 2017, only 15.4 km of highway were put into operation.

b. Insufficient attractiveness level to invest

Although there are favourable conditions for investments in the Constanta Port Area and its hinterland, apparently investors are not attracted to make significant economic development investments in factories producing or assembling consumer goods which would ensure an economic growth in the area and a significant positive evolution of the port traffic.

A number of clear incentive policies for investors could be developed and abided by over a relevant period of time so that, along with an efficient publicity, they may ensure are launch of investments in the area.

The last period of time has been one in which some investments in economic objectives have been made in the area of the Port of Giurgiu. However, the results are far from the potential of this area.

There still is a positive impact of investments in the area of the capital city on the development of port traffic, but much more dynamic steps are needed in order to promote investments in the area of the Port of Giurgiu, which will contribute to its development.

c. Transit of the Danube-Black Sea Canal

The access of river vessels to the Port of Constanta is made after the transit of the Danube-Black Sea canal, including 2 locks at the ends of this canal. The necessity of recovering the investment made for the construction of this canal has caused the Romanian authorities to set fees for its transit and for the locking system.

This leads to increased costs and shipping times, which are sometimes likely to weaken the interest in using this transport route

d. Low levels of Danube waters

Although all the Danube navigation surveys show that during periods of drought there are sectors where the water level is very low, which makes navigation of many of the convoys impossible, this has not yet been solved.

e. Periods of time when the Danube waters are frozen

Another limitation of the navigation periods on the Danube is when, due to low temperatures, the Danube is frozen.

For the goods the delivery term of which is a critical issue, as well as for ship owners, who are exposed to additional risks and costs, periods like this lead to a low level of attractiveness for inland waterway transport.

f. The legal and economic framework

The recent political changes in Romania have led to legislative modifications, many of which also affecting the economic framework, as is the case of the amendment of the Fiscal Code. Such changes often reflect in the evolution of market prices and foreign exchange rates.

Generally, entrepreneurs are looking for a high predictability level of the legal and economic framework, so that they may establish medium and long-term strategies and partnerships enabling them to work with low profit margins under significant competitive conditions.

g. Decline in industrial production on the region

In recent years, important industrial enterprises in the big cities of Romania, some energy-intensive ones, have reduced their activity, leading to a significant decrease in the industrial production which affects also the traffic of Romanian ports. The former industrial plants over Braila – Galati region have now smaller production quantities and some of them had been closed during the last years.

Thus, the raw materials utilized for the production of final products are no longer needed or are needed in smaller quantities, leading to a decrease in port traffic.

h. Critical conditions of navigation on the Lower Danube, and on the River Danube

Navigation conditions in the Lower Danube stretches do not fulfil the official technical requirements related to the necessary depths for tug-boats and especially barges and this fact lead to increased costs for the IWT cargo and finally in the reduction of the cargo flows on the Danube, affecting the ports.

i. Competition with other ports

Port of Constanta is one of the main competitors on the segment of draft vessels up to 7.5 m, which has taken over the last few years some of the freight traffic of the Galati port. While both ports share the same hinterland, Constanta harbour is better connected and benefits from modern operating facilities. Also, the depths of the port basins are higher, which allows transport on large vessels and, implicitly, reduction of transport costs.

All over the Danube Lower Region, the IWT cargo is more or less the same for all ports located on this area. As well, the distance between the main river and sea-going ports located in the maritime stretch of the Danube (Galati, Braila and Tulcea) is not so long (15 km between Galati and Braila and 80 km between Galati and Tulcea).

Therefore, the difference among these ports is to be given only by the port infrastructure and superstructure status and by the port services offered by the private port operators.

10 Bulgaria

10.1 Port of Vidin SWOT Analysis

10.1.1 Introduction

The port of national importance Vidin is situated from km 792 to km 785. Vidin district is located in the most north-western part of Bulgaria and covers less than 3% from the territory of the country. It borders the Republic of Serbia and the Republic of Romania through the Danube River. Port of Vidin includes one passenger, one ro-ro and two cargo port terminals as follows:

- Port terminal Vidin-Centre;
- Port terminal Vidin-South;
- Port terminal Vidin-North;
- Ro-Ro Terminal – Vidin.

Table 26: Basic characteristics of the Port of Vidin

Port characteristics	Unit	Vidin-south	Vidin center	Vidin-north	Ro-Ro
Area	m^2	47887	18642	115705	2920
Berths (cargo& passenger)	number	2	7	2	1
Length of berths	m	160	1440	570	40
Open storage area	m^2	18000	-	12000	
Covered storage area	m^2	-	-	3131	-

(Source: BPICO)

The management of the port infrastructure and other related port assets is granted to the Bulgarian Ports Infrastructure Company (BPICo.). The ferryboat complex and terminal Vidin - north are granted on concession to "Bulgarian River Shipping" JSCo. for a period of 30 years as of 2010.

Port terminal Vidin – centre is operated by the state owned port operator “Port Vidin” Ltd.
Port terminal Vidin - south is currently managed by BPICo., procedure for concession is ongoing. There are four other port terminals with regional importance registered in the area of Vidin.

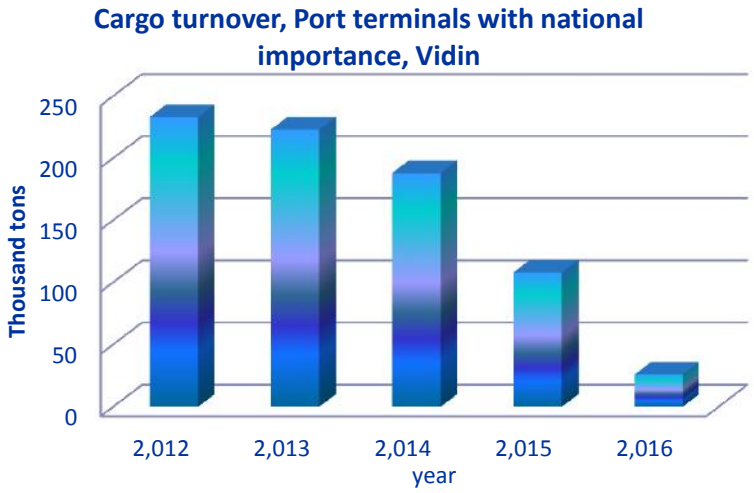

Figure 12: Cargo statistics, Port of Vidin

(Source: BPICO)

Port terminals designated for cargo handling are Vidin-south and Vidin-north. The data in the table above show clearly that there is a constant decline in the cargo output during the last five years. Main cargo groups are grain and coal.

10.1.2 SWOT analysis

Main aspects of strengths, weaknesses, opportunities and threats are given in below table.

Table 27: SWOT matrix for the Port of Vidin

Strengths	Weaknesses
• Good geographical location; • One of the Bulgarian river ports with national importance; • Multipurpose terminals, open to all clients; • Flexible management of terminals granted on concession; • Area for further development available; • Free capacity for handling and storage of cargo;	• Smallest Bulgarian river port; • Mostly old infrastructure of the terminals; • Limited diversity of cargo types handled; • Mostly sloped quay walls, no basins; • Limited railway connection (only to Vidin-north); • No waste reception facilities.
Opportunities	**Threats**

• Attraction of new cargo flows; • Attraction of investment for important projects; • Economical and infrastructural development of the region; • Rapid growth of the activity of the companies – concessionaires; • New contracts for concession;	• Deepening of the bad economic situation in Vidin province; • Overall decline in river cargo turnover; • Irreversible falling behind regional port development; • Deviation of cargo flow from the ro-ro to the new Danube Bridge; • Breaking of the concession contract.

(Source: BPICO)

10.1.2.1 Strengths

S.1: One of the strengths of the three Bulgarian river ports considered in this analysis is their geographical location. Bulgaria has a favourable position on a crossroad between important routes to and from EU, Asia, the Middle East, etc.

Two Trans-European corridors pass through Vidin district - № IV Dresden/ Nürnberg – Prague–Wien/Bratislava–Budapest-Krajova(Romania)-Vidin-Sofia-Thessaloniki/Plodviv - Istanbul and № VII Danube river (Rhein – Main - Danube).

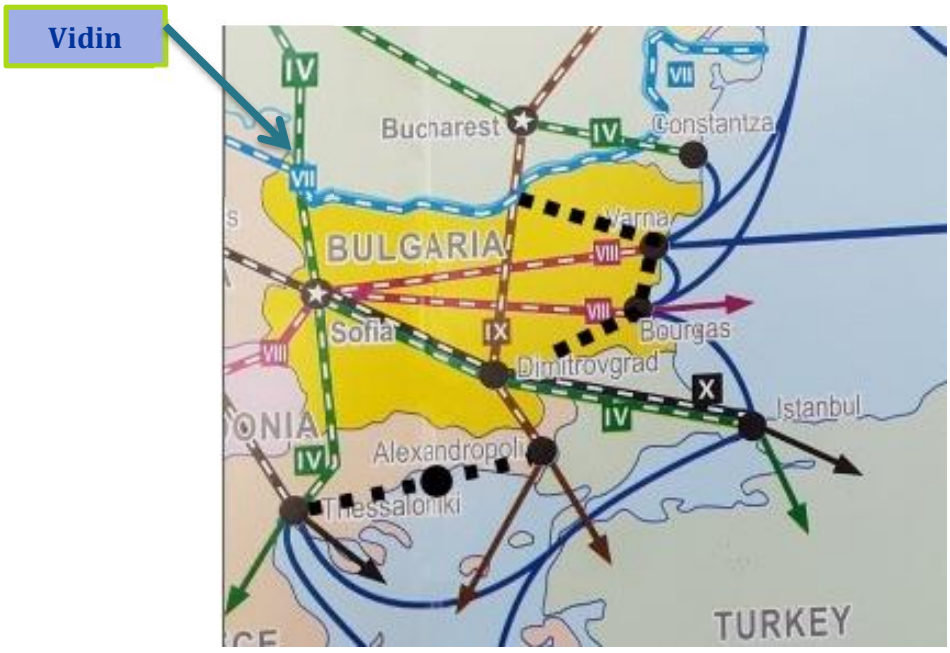

Figure 13: Transport connections in Bulgaria

(Source: Ministry of transport, information technologies and communication)

This is the first Bulgarian city along the River. The Danube Bridge 2 connecting Vidin and Calafat is seen as a key node for the future development of Corridor IV and for the South-east

transport axis. The bridge is the necessary prerequisite for exploring the possibilities of combined transport and redirecting traffic from road to rail.

S.2: Bulgarian ports with national importance are identified within the frame of the national legislation and are officially registered by the Executive agency Maritime administration. Port of Vidin, with its terminals Vidin-center, Vidin-south, Vidin-north and Ferryboat complex Vidin is one of the river ports with national importance, and thus included in the regional and national strategic documents – plans for development, transport and infrastructure analyses, etc. Being a nationally important port, Vidin is within the scope of activity of the Bulgarian Ports Infrastructure Company (BPICo.). BPICo., together with the companies, that operate the terminals, have the task to develop and improve the port activity. Ports with regional importance /Ro-Ro SOMAT, Ecopetrolium, the dredging fleets "Dunim" and "Badin" Kozloduy/ are usually managed by private companies and their development depends entirely on the policy and resources of their private owner.

S.3: What is specific for ports of national importance is that they are multipurpose and open to all clients. This brings a feeling of security and reliability to all clients, that their ships will be accepted and handled on an equal basis. On the other hand, the port is not limited by handling certain cargo types or servicing certain clients.

S.4: Granting port terminals on concession is a continuous national policy, having important purposes such as infrastructure and marketing development of the terminals. There are already good examples, that there is actual development: the company concessionaire of Vidin-north has developed three new berth places for bulk cargo. One new crane was put into exploitation there, and one auto weighing scale, increasing the handling capacity. New concrete pavements were made with area of 1200 sq.m. Furthermore, the concessionaire maintains the balance between infrastructural condition of the port and the market demand for port services.

S.5: Having a reserved area for future development widens the possibilities of the port. This means that future projects for development could be implemented, new clients and or investors could be attracted without limiting the existing activity,

S.6: Similar to the availability of a free area for development, the free capacity is a good side that could be a proof for good organization or a possibility to act proactively in cargo search.

10.1.2.2 Weaknesses

W.1: Vidin is the smallest Bulgarian river port. This means that its capacity for handling and for attracting investment is limited to lower clients 'demand.

W.2: Old infrastructure is one of the main weaknesses typical for Bulgarian river terminals. This leads to ineffective handling, frequent damages and, in the end, unsatisfied clients. The financial resources needed for total renewal of the ports cannot be ensured at once.

W.3: Having in mind that the port depends on the industries in its hinterland, Vidin is handling narrow cargo variety – coal, grain, etc. This causes falling behind the modern tendencies in the port sphere.

W.4: Sloped quays are relatively old structures that especially during low water periods are ineffective for handling vessels. The conventional cranes in the quay area (boom-type) spend more electric energy and lift smaller quantities per one turn in such conditions.

W.5: Missing railway connection limits the handling possibilities and is a marketing disadvantage for cargo using railway transport, and or multimodal transport.

W.6: Port Vidin has no waste reception facilities and investment is needed to fulfil the existing legislative requirements,

10.1.2.3 Opportunities

O.1: Opportunity exists for development on national or regional scale targeted at attracting new cargo flow schemes, including transit cargo logistics. Attracting new industries in the region would also create an option for new clients and higher cargo turnover.

O.2: Having in mind most of the listed weaknesses, managers of the port of Vidin could focus on the opportunity to attract financial resources to eliminate the problems, for example new handling facilities, repair of the infrastructure, etc.

O.3: Statistical data show that Vidin is on one of the last positions with regard to economic development, not only in Bulgaria, but in Europe also. Taking effective measures for economic development would create good opportunities for establishing new factories, new work places, higher import/ export volumes and would probably result in higher port activity.

O.4: Two of the terminals of national importance in Vidin are granted on concession. There are already developments made by the private company. If the company continues to develop its business, it will naturally expand the port activity within its scope.

O.5: New concession contracts would assure additional funding opportunities and would bring benefit from the flexible management of the private port operator. If, for some reason the existing concession contracts are terminated, finding new concessionaires would be a priority.

10.1.2.4 Threats

T.1: The region is on one of the last positions in terms of foreign investment. The impact of the economic crisis after 2008 cannot yet be overcome There is a strong need of road network improvement and reconstruction in the region. The reason for the relatively bad condition of the roads is the financing of repair works with municipal budget. The lack of municipal budget and the high level of investment needed leads to worsening of the situation. Furthermore, there is negative demographical trend and low investment activity in the region. Worsening of the economic situation would cause a very negative influence on the port activity.

T.2: There is a risk for overall decline in the river cargo flow caused by the low economic activity of the local business, unreliable river transport due to fluctuation of water levels, strong wind, fogs, freezing, etc. leading to losses for the river industry. If there are further additional factors – economic crisis, disasters and accidents – cargo flow through the Danube River could get critically lower.

T.3: Failing to modernize port facilities creates a threat to gradually loose most of the clients. The threat acquires a wider dimension, if there are no safe and effective handling and storage conditions in the port, due to old equipment and infrastructure.

T.4: Although the existence of the second bridge between Bulgaria and Romania is of strategic importance, the port suffers deviation of cargo flow. This is in full force for the ferryboat terminal in Vidin, which practically stopped working after putting the bridge into operation. Continuous use of the bridge could lead logistic companies to avoid the port when possible.

T.5: Having in mind that granting port terminals on concession is of utmost importance for their development, breaking of such a contract brings risks for the port development. Clients would be insecure what to expect with regard to whether there will be change in the prices and conditions of the port, what would be its future development. A process for new granting on concession has to start.

10.2 Port of Lom SWOT analysis

10.2.1 Introduction

Port of national importance Lom includes two terminals – Lom and Oryahovo. They are located on the right bank of the river Danube, from km 741.960 to 742.500 for Lom and from 677.600 to 678.200 for Oryahovo. The city of Lom is located in the North-western part of Bulgaria and takes almost 9% of Montana region. Oryahovo is located in Vratsa region and takes also 9% of its territory. The distance between the two cities is 72 km. by road. The distance to the capital of the country – Sofia is only 160 km. from Lom and 180 km from Oryahovo.

Table 28: Characteristics of the two terminals of the Port of Lom

Port characteristics	Unit	Lom	Oryahovo
Area	m^2	371 100	12 300
Cargo berths	number	13	2
Length of berths	m	1335	221
Open storage area	m^2	117 921	4 400
Covered storage area	m^2	8343	962

(Source: BPICO)

The management of the port infrastructure and other related port assets is granted to the Bulgarian Ports Infrastructure Company (BPICo.). Port terminal Lom is granted on concession to the company "Port invest" JSCo. for a period of 35 years as of May 2013. Port terminal Oryahovo is also granted to the concessionaire "Slantchev dar" JSCo. for 25 years period as of June 2008.

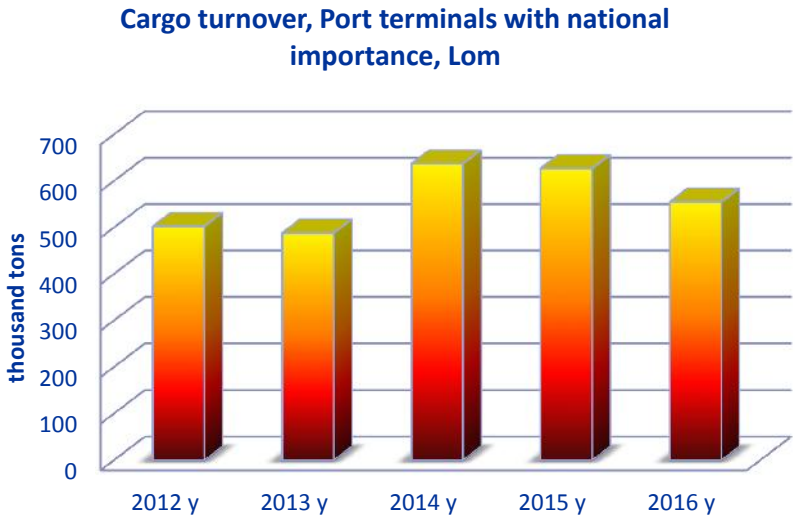

Figure 14: Cargo statistics, Port of Lom

(Source: BPICO)

Oryahovo takes between 13 – 20% from the total cargo handling of the port of Lom for the period 2012 -2016. The main cargo type there is grain. Terminal Lom has diverse cargo structure and manages to keep stable cargo flow during the last five years – about ½ million tons per year.

10.2.2 SWOT analysis

Main aspects of strengths, weaknesses, opportunities and threats are given in below table.

Table 29: SWOT matrix for the Port of Lom

Strengths	Weaknesses
• Good geographical location, close to Sofia – the capital of the country; • Second biggest port of national importance; • Multipurpose terminals, open to all clients • Well-equipped port; • Free capacity for attracting cargo for handling and storage; • Flexible management of the concessionaires	• Relatively old infrastructure in both • Intermodal transport not developed; • Predominant handling of dry bulk cargo (inert materials, grain); • Terminal Oryahovo is a small port that is not connected to the national railway system and has only sloped quay walls; • No waste reception

Opportunities	Threats
• Development of the transport infrastructure with regional, national and international importance; • Attraction of investment for important port projects; • Economic development of the region; • Rapid growth of the activity of the companies – concessionaires;	• Overall decline in river cargo turnover; • Breaking of the concession contracts. • Deepening of the negative economic and demographic situation.

(Source: BPICO)

10.2.2.1 Strengths

S.1: Lom is located on the river Danube and is connected to the Trans-European Corridors VII and IV. In addition, the port is relatively close to the capital of Bulgaria, where there is brisk commercial activity.

S.2: Being the second biggest river port in Bulgaria, Lom attracts bigger cargo volumes and is known among the clients as important logistic point for handling and storage of grain, fertilizers, coal, ores, metal products, etc. The marketing plan of Lom municipality states that port terminal Lom used to handle around 40% of the Bulgarian river cargo turnover. Similar to S.2 for port of Vidin, Lom is of national importance and within the scope of activity of the Bulgarian Ports Infrastructure Company (BPICo.). The terminal with regional importance Ferryboat complex Oryahovo depends entirely on the decisions of its private owner.

S.3: Port of Lom is open to all clients and cargo types that are within its abilities to handle. The port does not depend on limited variety of cargo, and could easily re-adapt its activity to meet the demand for port services.

S.4: Port of Lom has 15 cargo berths, 10 of which are in a basin. The port disposes of 19 cranes in Lom and 3 in Oryahovo. There are open and covered storages. Lom serves cargo from and to river, automobile and railway transport modes. The port could easily meet high cargo volumes.

S.5: With regard to cargo handling, port of Lom could handle at least 3 times more than the current quantities. Statistical data from the past (2006) show, that Lom reported over 1,3 mln. tons of cargo per year. Stated capacity is 3,5 mln. tons/ year. There is free area for further development.

S.6: On the last position, but a very important strength is, that both terminal are granted on concession. Private companies invest private investment resources in the ports and attract cargo with the competitive advantage of the active marketing. Lom and Oryahovo have stable

and positive image among their clients. It could be concluded that concessions are successful and bring positive results to the ports.

10.2.2.2 Weaknesses

W.1: Although there are investment projects from the side of BPICo. and from the side of the concessionaires, works are partial and do not include entire renewal of the port. Most of the quay walls, internal railways, crane tracks, storage pavements, etc. are old. This causes harder and more expensive maintenance and more frequent damages. Handling is slow and ineffective.

W.2: Port of Lom has all the prerequisites for development of intermodal transport – located on international routes, access to river, rail and road. However, there is no evidence for developed intermodal transport, for example of containers, swap bodies, block trains, etc. The cargo structure remains unchanged as a whole through the years. This is a marketing disadvantage that puts Lom in unfavorable position with regard to the international port cargo trends. Intermodal facilities are almost missing – specialised berths, storages, equipment and technique.

W.3: Similar to the second weakness, the characteristics of handling predominantly dry bulk cargo has no positive effect, having in mind that coal, coke, and other cargo decline during the years. Furthermore, the price that the port receives for the port service is lower than handling general cargo for example. There are no oil, chemical or gas terminals in Port of Lom – building of such facilities requires long-term planning and essential investment;

W.4: The lack of railway link to terminal Oryahovo limits its service range.

W.5: No waste reception facilities as per the requirements of the Bulgarian and European legislation. Investment needs to be assured.

10.2.2.3 Opportunities

O.1: The port would benefit if steps are taken to improve and develop the national and international transport infrastructure. Cargo traffic would increase and the transport speed would be higher.

O.2: Lot of competitive advantage would be gained if investment is assured for important port development. Such investments may include quay renovation, open storage rehabilitation, new covered and specialized warehouses, facilities for handling of heavy cargo units.

O.3: Another opportunity is the economic development of the region, for example: new local companies, foreign investment, new manufacturing enterprises, new logistic centres. All of the listed, and not only, would bring higher commercial volumes, higher employment, higher incomes, and thus boost port activity also.

O.4: Growth of the activity of the companies –concessionaires would probably lead to increased use of port services. Some active measures from the side of the operators could attract external funding – from EU funds, bank loans, or other sources.

10.2.2.4 Threats

T.1: One of the threats for all river ports in Bulgaria is decline of the competitiveness of the river transport. Especially for port of Lom, there are concerns that its importance in the transport schemes would decrease and its effectiveness would constantly fall. Transport over the Danube became less reliable as it is strongly influenced by weather conditions and the water level of the river. Cargoes became more specific and demanding. Failing to adapt to the new transport requirements would definitely put ports (and Lom) in disadvantageous position.

T.2: The risk for the port activity is very high if, for some reason, the contract for concession is terminated unexpectedly. With the change of the operational management there are always shocks internally for the port and externally for the clients and counterparties. Such a threat could deviate cargo flow to other terminals / competitors.

T.3: The region in which port of Lom is located is in relatively bad economic situation. The condition of the technical and social infrastructure is not satisfactory. There is unbalanced development between the city and the area around it (villages, not urbanized territory). There is no direct access to highways or speedways. The population of working-age is decreasing. Unless these deficiencies are overcome not much could be expected for the future development of the port also.;

10.3 Port of Ruse SWOT analysis

10.3.1 Introduction

The territorial range of the Port of national importance Ruse spreads over the cities Nikopol (one ferryboat terminal), Somovit (cargo terminal), Svishtov (cargo terminal), Ruse (two cargo terminals: Ruse-east managed by Port Complex Ruse JSCo and Ruse-west managed by BPICo., one terminal for ships' stay Ruse-centre) Tutrakan (cargo terminal) and Silistra (passenger terminal). There are several other terminals with regional importance in the area ot Port of Ruse, but they are not subject of the current analysis. Below are the main characteristics for the cargo terminals of national importance within port of Ruse. Passenger and pontoon terminals are excluded from the table.

Table 30: Characteristics of the cargo terminals in the Port of Ruse

Port characteristics	Unit	FT Nikopol	Somovit	Svishtov	Ruse-east	Ruse-west	Tutrakan
Area	m^2	17 642	30 105	318 178 (81 917 on concession)	825 533	117 098	4 414
Cargo berths	number	1	2	8	14	11	1
Length of berths	m	114	354	922	1 618	1 500	110

Open storage area	m^2	-	9 700	22 800	190 500	27 600	2 500
Covered storage area	m^2	-	2 175	6 100	15 800	8 900	-
Port operator		concessionaire	concessionaire	concessionaire	State owned operator	BPICo – state owned	State owned operator

(Source: BPICO)

The management of the port infrastructure and other related port assets is granted to the Bulgarian Ports Infrastructure Company (BPICo.). The table above shows which type the port operator of each terminal belongs to. There are three private operators and two state-owned operators.

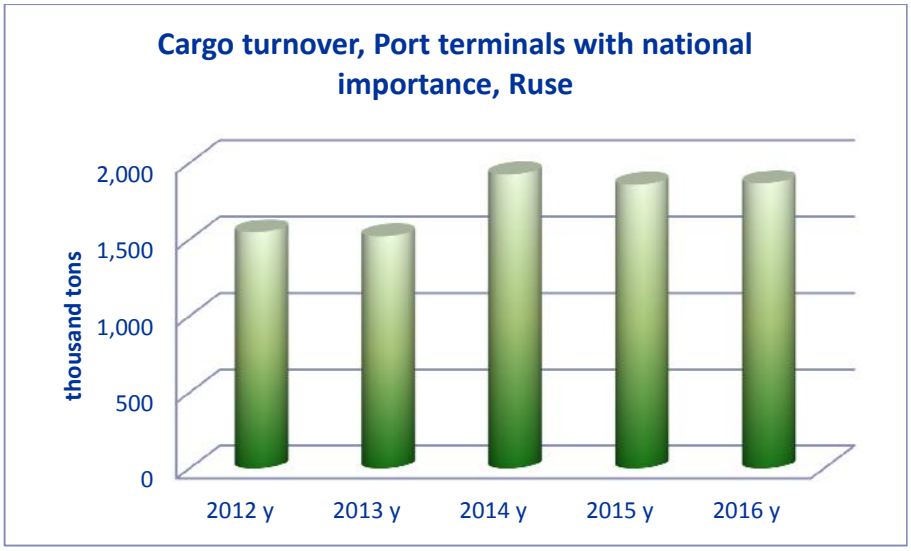

Figure 15: Cargo statistics in the Port of Ruse

(Source: BPICO)

Port terminal Ruse-east handles about 600-700 thousand tons export and import cargo per year. Svishtov reports bigger quantities (approximately 800 th.tons/year), but they include transhipment of sand and gravel, or the so called cabotage cargo. Somovit has handled more than 200 thousand tons/ year for the last three years and Ruse-west handled more than 110 thousand tons in 2016. Terminal Tutrakan has no regular activity and does not report any cargo during 2014 and 2016. Ferryboat terminal Nikopol services the ro-ro line between the Bulgarian city and Turnu Magurele in Romania. The tonnage of transported vehicles is excluded from the data. This terminal has started handling grain and has more than 30 thousand tons of this cargo for the last two years. The graphic below shows the share of each terminal in the total cargo volume for 2016.

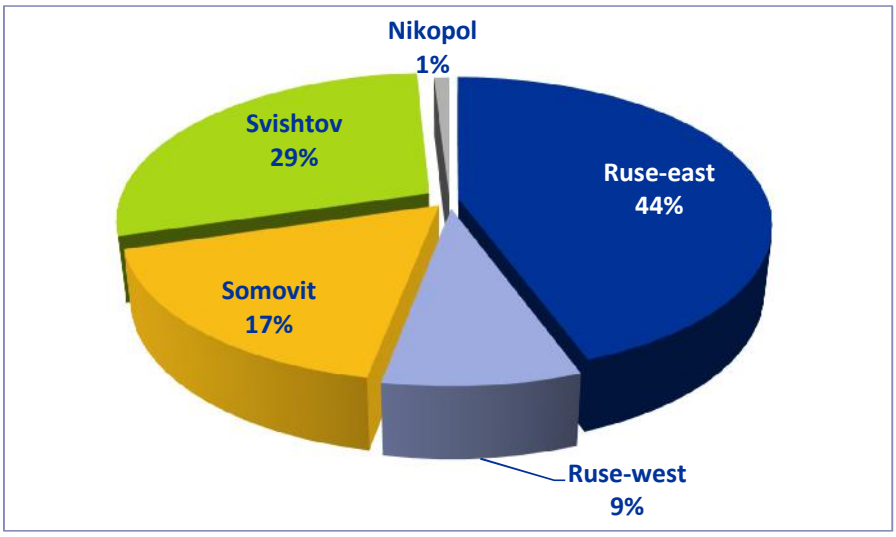

Figure 16: Terminal shares in overall throughput in the Port of Ruse

(Source: BPICO)

10.3.2 SWOT analysis

Table 31: SWOT matrix for the Port of Ruse

Strengths	Weaknesses
• Favourable geographic situation on key European corridors. • Biggest cargo river port in Bulgaria and with national importance; • Free handling and open storage capacity • Diverse cargo structure in Ruse; • Available area for further development of new berths, storages or other port facilities;	• Predominantly old infrastructure and handling facilities; • Lack of satisfactory number and condition of the covered and specialized port warehouses; • The terminal in Tutrakan has no regular activity;

Opportunities	Threats
• Successful concession procedures; • Utilization of the area for future development; • Development of intermodal terminal; • Development of the logistic potential in connection with the transport link between Ruse and Varna. • Improvement of the regional transport infrastructure;	• Overall decline in river cargo turnover; • Loss of cargo due to high number of Bulgarian and foreign competitors • Breaking of concession contracts, failing in successful realization of concession procedures.

(Source: BPICO)

10.3.2.1 Strengths

S.1: Port terminals that are part of the port cover wide territory. Svishtov, Somovit and Nikopol are convenient transport nodes for the central part of the country. Ruse is the fifth largest city in Bulgaria that has a core port and core railway node within the transport European network (TEN-T). The hinterland of the port covers all the country and includes logistic schemes to and from Western and Central Europe, Romania, Serbia, Ukraine, Turkey, etc. The distance to the capital of Romania - Bucharest is only 75 kilometres and passes through the Danube Bridge 1, Port of Ruse has a good reputation and stable market positions in the region.

S.2: All six terminals with national importance in Port of Ruse include 37 cargo berths, two of which are ro-ro ramps, cranes in the quay area and in the storage area, open and covered warehouses, customs offices, connection to river, rail and automobile network. This port is the leader in the Bulgarian river cargo turnover. Ruse-east has ability to accept sea-river vessels with carrying capacity of 2 – 3 000 tons when the water level is suitable. The estimated average capacity of all terminals (without ferryboat tonnage) is about 8 mln. tons/ year. The national significance of this port determines its strategic importance for the transport network of Bulgaria. Development of Ruse port is included in national strategic documents, falls within the scope of Bulgarian Ports Infrastructure Company and concessionaires – operators. As it was already commented, private terminals with regional importance (in the range of Ruse River directorate: Silistra Polaris, Silistra Lesil, petroleum terminal Arbis, Port Bulmarket, Dredging fleet Ruse, Svoshtov Sviloza, Petrol Somovit, Ruse Freezone, Belene, Dubal We Co, East Point Silistra, ADM Silistra) are dependant of the financial and technical abilities of their private owners.

S.3: Ruse is a well-equipped port with regard to the existing cargo structure and volumes. It has free capacity for handling bulk and general cargo. There is also capacity for intermodal logistics, as the port has internal railway tracks, including tracks with direct access to the front quay and cranes.

S.4: Ruse is a port where lot of clients and cargo types are served. Most common types from the past are coal (for industrial and domestic purposes), grain, metal products, etc. During the last 10 years some new cargoes were transhipped: wind electrical turbines, agricultural

machinery, new cars, trailers, fertilizers etc. The port is able to adapt to cargo change, and in addition it is acting in a very competitive environment – only in the city of Ruse there are several cargo terminals – Ruse-east, Ruse-west, Port Bulmarket, Dredging fleet Ruse, Ruse Free zone – all competing between each other. Among them, Ruse-east is the biggest terminal with the highest cargo volumes.

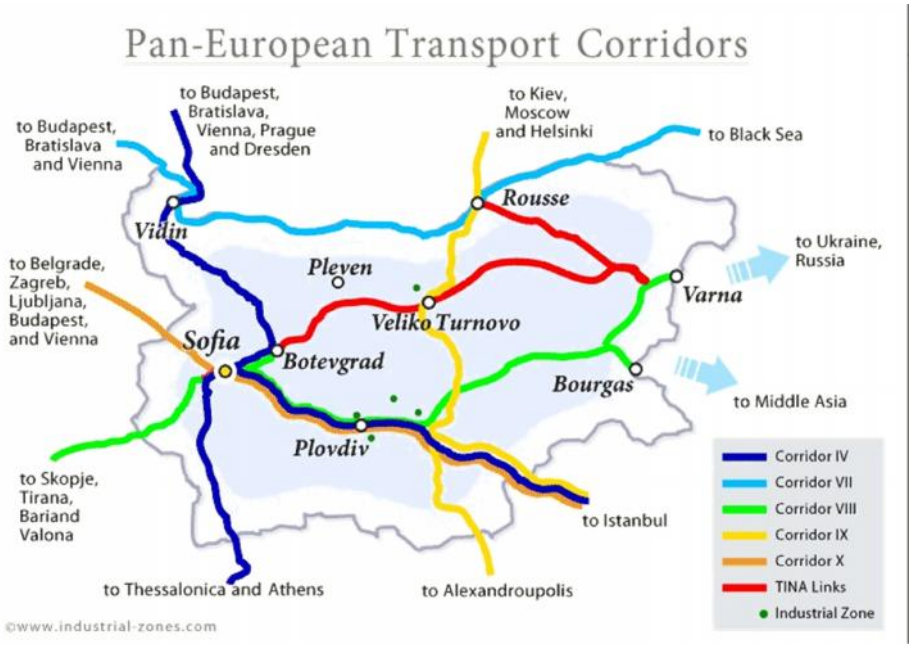

Figure 17: Pan-European Transport Corridors in Bulgaria

(Source: BPICO)

S.5: Ruse-east and Somovit have free space available for future initiatives. About 300 thousand square meters from the territory of Ruse-east are free for development of new storages, new berths, new operational facilities, etc.

10.3.2.2 Weaknesses

W.1: Port infrastructure as quay walls, storage areas, office buildings are old. Quay walls are mostly sloped type, only in Ruse there are two basins in Ruse-east and Ruse-west. That causes more expensive maintenance and gradual productivity decrease. Operators have taken steps to repair infrastructure and to buy new facilities, but entire renovation has not been done.

W. 2: As it was already mentioned, cargo becomes more requiring with regard to handling and storage conditions. More and more commodities have to be stored in covered and specialised areas – such as metal products, food products, chemicals, etc. Bulgarian river ports are usually universal or their covered warehouses are not enough to cover clients' demand. This deviates cargo to industrial zones with modern storage facilities.

W.3: Having in mind the dense port network in Bulgaria, there are small terminals, like Tutrakan, that lack activity. Port terminal Tutrakan used to have regular activity in the past, when it reported handling of 30-50 thousand tons grain, coal, etc. During the last several years it reports very small quantities, or even years with zero volume. Problems exist with the local population that do not want heavy vehicles to pass through the city. On the other hand there is no stable demand from the side of the clients to work on this terminal.

10.3.2.3 Opportunities

O.1: There are terminals in port of Ruse that are not granted on concession, including one terminal with terminated concession contract. There are analyses ongoing for granting Ruse-east, Ruse-west and Tutrakan on concession. There are already concessionaires in Svishtov, Somovit and Nikopol. Opportunity exists for granting terminals and thus attracting investment and higher cargo flows.

O.2.: Development of the space free for development in Ruse and Somovit would result in availability of new facilities, new clients and increase in the cargo volume.

O.3: Ruse is one of the cities with high capacity for intermodal traffic. Clients in this sphere usually look for specialised intermodal terminal designated to serve intermodal cargo flow – handling, storage and repair of containers, swap bodies, etc. As intermodal lines require accuracy and stability, universal ports cannot always meet the high demands. Currently, there is no such demand for intermodal flows[24], but creating conditions for the clients would define Ruse as important logistic point for this port segment.

O.4: The link between Ruse and Varna has been an object of lot of researches. From the putting into operation of the railway line in 1866 the line has not been completely repaired. There were plans for recovery of the project parameters and doubling the railway line in order to serve transit cargo flows. Currently, a project is discussed for development of a transport corridor to Greece and is set as priority by the Bulgarian Ministry of Transport, Information Technologies and Communication. It plans to connect Ruse, Varna and Burgas on the Black Sea with a railway line to the border in Svilengrad, and reach port of Thessaloniki by rail/ automobile network.

[24] There was an intermodal line between port of Ruse and Nuernberg, for the period between 2014 – 2016. Unfortunately it does not exist anymore. There are small quantities of containers served between Port Ruse-east and Curtici /Romania/.

Figure 18: Planned and new connections in Bulgaria

(Source: https://static.nova.bg/public/pics/nova/news/980x551_1504550342.jpg)

O.5: Port of Ruse is an important transport centre and generates cargo traffic for all modes – automobile, railway and river. Currently the road 1-5 Ruse – Byala - Veliko Tarnovo is busy and with lot of incidents. There is long waiting time at the Danube Bridge Ruse – Giurgiu. Improvement of the existing incoming and outgoing road and railway routes would increase traffic speed and improve the carrying capacity.

10.3.2.4 Threats

T.1: As it was already commented for ports of Lom and Vidin, there is a threat of a total decline in the river cargo turnover. River transport became insecure as it is weather dependant and the condition of the fairway cannot meet the requirements for efficiency. Clients, on the other side, prefer mostly automobile, and railway cargo transport. The river can offer alternative for relatively big quantities of not too sensitive cargo at a long distance. All investments in port infrastructure could lose their beneficial impact if the importance of the river transport declines significantly.

T.2: There is already lower annual cargo volume for the lower part of the Danube after the world economic crisis. Ports are competing for less cargo quantities in conditions of dense national port network and competition from Romanian ports also. Efforts of the competing ports include even price dumping and fight for every ton that can be attracted. Private ports are more aggressive and there is threat for the ports of national importance to fall behind their competitors in terms of cargo volume and profit. Furthermore, there is competition from the side of private logistic centres and from the sea ports that already have attracted grain, metal products, machinery etc. from river ports.

T.3: Strategic development plans for ports include successful concession procedures. Breaking of an existing concession contract or problematic new concession procedures would cause slowdown in port development. There is a threat of unnecessary waiting periods and standstill in cases of terminated or unsigned concessions.

10.4 Country-wide SWOT analysis of the Bulgarian port industry

Please summarize the aspects of strengths, weaknesses, opportunities and threats which are more related to the national level, rather than to the local, port level.

Table 32: SWOT matrix for the port industry in Bulgaria

Strengths	Weaknesses
• Very favourable geographic location of the country; • Dense transport infrastructure – ports, roads, railways; • Good competition level; • Ongoing measures for port development; • River information system functioning; • Traditional local cargo flow that could not be deviated to competitors; • Free capacity for port services; • Highly qualified personnel.	• Unsatisfactory condition of the port infrastructure and the connecting infrastructure; • High handling capacity for cargo types that are constantly decreasing; • Intermodal transport not developed enough; • Low percentage of goods transported by river (both domestic and international); • Unsatisfactory coordination between different modes of transport and lack of integrated transport systems; • Lack of satisfactory number and condition of the covered and specialized port warehouses; • Limited role of the private sector in terminals not granted on concession;
Opportunities	**Threats**
• Optimization of the Danube waterway and increase in domestic and international river transport; • Good opportunities for attracting transit cargo from Western Europe and the Middle East, West and Central Asia; • Establishment of economic zones. Development of clusters to boost competitiveness; attracting foreign direct investment to increase employment; • Concession of terminals that are not currently granted on concession;	• Significant decrease in the overall river transport in Bulgaria • Risks connected with the active competition of neighboring states in which transport projects are carried out - alternative to the routes through BG river and sea ports • Outflow of qualified port personnel • Potential new cost of implementation environmental legislation, negative public attitudes of the population on the territory of the area regarding the

• Modernization of the handling facilities and port infrastructure; • Improving security and safety systems in ports	construction of waste treatment facilities. • Insufficient investment in port infrastructure and new handling technologies • Lack of resources for maintenance and repair.

(Source: BPICO)

10.4.1.1 Strengths

S.1: There are FIVE trans-European transport corridors passing through Bulgaria - No IV, VII, VIII, IX и X. This is a key geographic position ensuring transport link between Central and Western Europe, the Middle East, Western and Middle Asia. The transport sector in Bulgaria takes important place in the national economy. Bulgaria has all modes of transport – river, sea, road, automobile, railway and air.

Figure 19: Position of Bulgaria in Europe

(Source: https://bulgaria-in-pictures.alle.bg)

S.2: Bulgaria disposes of about 4 300 km railway network, about 20 000 km road network, where routes I-st and II-nd class prevail, and 6 motorways with about 800 km length. On the Bulgarian stretch of the Danube there are **15 river port terminals with national importance, 20 terminals with regional importance and 3 special purpose river ports**. Burgas and Varna are the two biggest Bulgarian sea ports on the Black sea.

S.3: Although it is a threat to each port, the high number of terminals competing with each other creates good marketing environment where clients and their requirements are put on the first place. No matter whether the port is managed by a state-owned or private company, terminals are obliged to keep their competitive advantages at a good level.

S.4: Another strong side of the port industry in the country is that there is a strategic approach and steps taken towards development of the port system. Lot of terminals of national importance are already granted on concession. Concessionaires accomplish their annual investment programs for maintenance and renewal of the port infrastructure. Procedures are foreseen for ports that are not given under concession. There are new berths, new silos, new machinery bought, etc. Concessionaires also pay the state annual concession payment according to permanent and changing indicators of the port activity.

S.5: For the first time in Bulgaria in 2017 the Single Window river information system started its productive operation. The system gives opportunity for electronic document processing, meeting in one point the ship owners and agents from the one side, and Customs, Border Police and Bulgarian Ports Infrastructure Company, on the other.

S.6: Apart from the high competition level, there are commercial cargo flows that are geographically stable, and could not be attracted by competitors. Such cargo flows are created by the local heating plants, importing coal, metal processing factories that are importing raw material and export their production. Having such traditional flows ensures the stable activity and incomes for port terminals.

S.7.: Bulgarian river ports have free capacity for handling additional cargo volumes and have free space for further development. This is a good strength when looking for new potential investors or when attracting new cargo flows. Ports could immediately meet more cargo traffic within their technological abilities.

S.8: Bulgarian port industry has a rich historical background. The long experience has created a good base of expert personnel that puts its efforts in maintaining and development of the ports. Periods of economic transition from planned economy to market oriented, economic crises, etc. have made long-term professionals adaptive. In addition, there are professional schools and universities that prepare specialist in the port sphere.

10.4.1.2 Weaknesses

W.1: In connection with the unsatisfactory condition of the port infrastructure, it could be commented that there is a historical lack of investment for maintenance and development. Most of the ports were built in the beginning of the last century. Usually the reason for the bad infrastructural characteristics is the high amount of resources required to renovate and

build new transport facilities. At the same time the state budget for port infrastructure is insufficient and the public-private partnership is still in process of development. The long payout period makes such investments unattractive. With regard to the connecting infrastructure – extremely low or high water levels of the Danube River are very problematic for the entire port sector. During low water levels, the cranes with short booms cannot handle ships in a safe and effective way. Connecting roads are usually passing through populated areas, there are lot of road section with traffic close to their full capacity. The percentage of road accidents is high. The railway network is in bad condition – with limited speed and limited carrying capacity in many sections.

W.2: The good characteristic of free capacity and space has also a negative side. Some cargo types that used to be main volume generators are currently decreasing and cannot be replaces in the same scale. Coal, coke, metal products, grain, inert materials are still handled in Bulgarian river ports, but in smaller quantities. In addition there are cargo flows that have disappeared after the economic transition – cargo flows from and to the former Soviet Union and other. As a whole, the Bulgarian economy has changed and the structure of produced and consumed cargo types is different. Due to low capacity of the Bulgarian economy, ports have to compete for transit cargo, which for the current moment is not very effective.

W.3.: There is no specialized intermodal river port terminal in Bulgaria. This is a major weakness in adapting to the European cargo flow trends. For Bulgaria, the inbound and outbound point for containers is the sea. The river cannot supply sufficient conditions, especially for waterborne intermodal units. It seems that the relatively bad condition of the railway transport also plays a negative role in development of this segment.

W.4: Bulgarian river port industry takes narrow share in the total volume of transported goods. The table below shows the distribution by transport mode in % from the total ton-kilometers for the country.

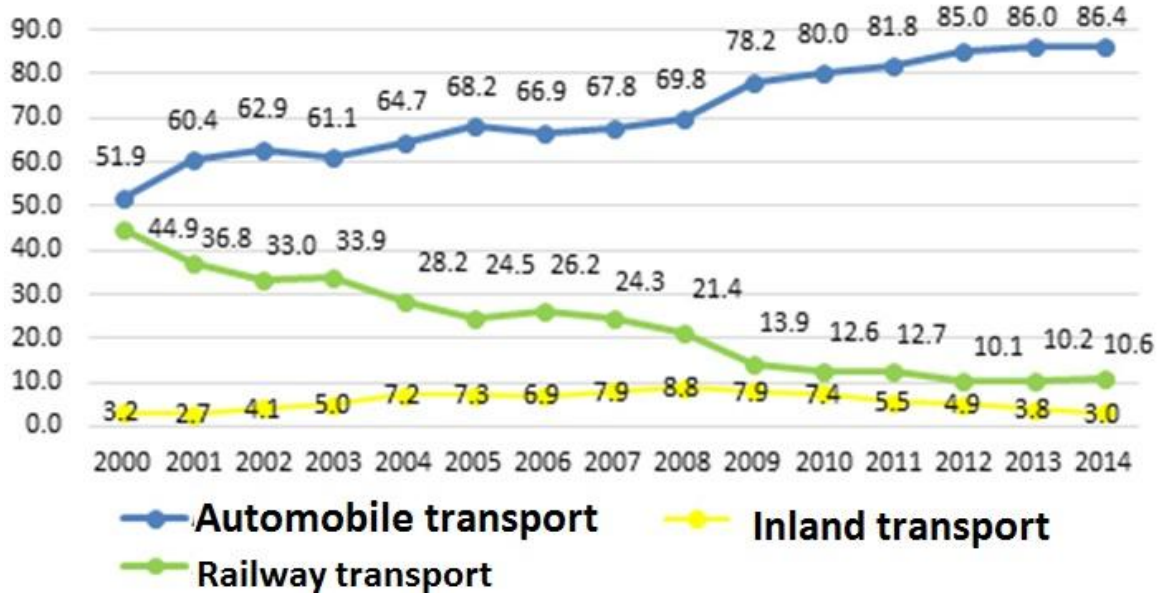

Figure 20: Modal split of transports in Bulgaria

(Source: http://eea.government.bg/bg/soer/2014/transport/transport)

Automobile transport takes the leading position for the period of research. It is faster and more reliable in comparison to the slow handling and low business attractiveness of the river. The limited capability of adaptation of ports to the fast changing market environment also had its negative impact on port activity.

W.5: There is no one and single information/ coordination system for all transport modes in Bulgaria. Each participant in the logistic process makes his own transport coordination. It is often the case, for example, of missing of trucks which have to deliver cargo to or to load cargo from ports. There is also lack of cargo wagons during busier periods. On the other side, bad weather conditions or other reasons could lead to late arrival/ handling of a ship. All of the examples cause long waiting times and additional costs to the logistic chain.

W.6: Current market demand for cargo storage requires clean, safe, air-conditioned, certified and specialized storage areas. Most of the universal port warehouses have to be adapted (if they are not already) in order to meet the legislative and market conditions.
W.7: Terminals operated by state owned companies are independent and have their own commercial and management policy. They do not receive budget funding for their expenses. According to the Bulgarian legislation, the port operator is the only organization that can perform port services. There is no current practice of building and functioning of (private) manufacturing enterprises within the port area. Limited private participation slows down port development to some extent.

10.4.1.3 Opportunities

O.1: Reaching the required navigational parameters of the Danube River in the Bulgarian – Romanian section would increase the speed and carrying capacity of the ships. Better navigation conditions are the precondition for increase in the river cargo traffic.

O.2: The strategic geographical position of the country creates opportunities for attraction of transit cargo. In order for a European funding scheme to be approved, the priorities must match those of the EU. The key geographical location gives Bulgarian river ports a good prerequisite for attracting external financing from this point of view. Moreover, in Ruse are located a port and a railway junction, which are part of the EU transport core network.

O.3: Port development is directly linked to the pace of economic growth. Creating good economic environment – such as the enlisted economic zones, clusters, etc. would influence port activity in a positive way.

O.4: As a result of the successful completion of the concession procedure, it can be expected that the technical condition of the port infrastructure, facilities and equipment will be substantially improved and the quality of the port services performed will increase significantly. This will lead to shortening ship and cargo handling time, reducing freight handling losses, etc., which will increase the overall level of competition between ports in the region.

O.5: Independent of the degree of ports concession, port operators and the authorities responsible have to ensure step-by-step modernization of port infrastructure and handling facilities. That would give opportunity to gain back lost cargo flows or to attract new traffic.

O.6: One of the strategic priorities in the port sector is creating conditions for bringing Bulgarian ports in line with EU requirements in the field of environmental protection, increasing the level of safety and security. This will create opportunity to attract more cargo from and to Central and Western Europe.

10.4.1.4 Threats

T.1: Main threat for the river port industry is significant cargo traffic decrease and reducing the overall importance of the river terminals for the economy. Decrease could be caused by many factors – bad condition of the fairway, economic crisis, disasters, terrorist acts etc. Regardless of the reason, lower or missing cargo traffic would have very bad impact on the river industry in Bulgaria.

T.2: On the basis of published information (news, press releases, web sites) it could be concluded that there is active development in the field of transport (and ports) in countries like Romania, Greece, Turkey, etc. Bulgaria is threatened to fall behind the regional transport development and thus important routes could escape its territory. The national budget could fail to co-finance the activities of the European funds and this also could lead to exclusion of Bulgaria from the transit flows. This important threat could be overcome by taking well targeted measures within the entire national transport system.

T.3: Having in mind that ports provide services, qualified personnel is of utmost importance for delivery of high quality port services. Threat exists for losing interest from the side of young people to work in ports, The negative demographic tendencies and the lack of active river port development in Bulgaria also create risk of decreasing of the number of qualified port workers.

T.4: Another possible threat could be the negative attitude of the local population to new port developments.

T.5: As it was stated in this analysis BPICo. and port operators take measures by investing in new infrastructure, renewal, repair and maintenance of the existing facilities. The high amount of resources needed leads to limited investment activity in the sphere. There is threat of insufficient investment in comparison to development paces on European and international level.

T.6: Another risk, connected to some extent to the previous one, is to have a situation where funds are allocated to more important project than these in the river ports sphere.

11 Common SWOT analysis

This section contains a "Common SWOT analysis", as agreed by participating project partners. In the "Common SWOT analysis", all strengths, weaknesses, opportunities and threats which are, in most of the cases, *common to the entire port industry* on the Danube. Such common SWOT will serve as a basic input for the Danube Port Development Strategy & Action Plan as an Output 6.1.

In addition to the "Common SWOT analysis", Annex I contains a "Cumulative SWOT analysis" for all participating countries' port industries, with certain rearrangements of strengths and weaknesses as internal factors to ports and opportunities and threats as external factors. The "Cumulative SWOT analysis" can be used for national port development strategies when and if seen appropriate, in addition to the "overall" Danube ports industry "Common SWOT analysis".

Table 33 contains a "Common SWOT analysis" for the entire port industry in the Danube region.

Table 33: Common SWOT analysis for the entire port industry in the Danube region

Strengths	Weaknesses
• Dense network of ports and transport infrastructure – ports, roads, railways in the region; • Connections with the maritime transport • Shipping costs and low level of emissions related to the volume of cargo transported • Experienced and flexible Port Operators and logistic competence • Good competition level; • Multimodality. The majority of ports are trimodal • Proactive management for promoting the development projects and applying the principle of partnership at the Port Community level • Experience in demand driven development • Good planning of inland ports development • The availability of a wide range of ship and freight services • Experience for development of projects and ongoing measures for ports development • Qualified personnel • Consolidated port management models (includes: Port management model; The use of corporatized port management model, which allows for development in accordance with market requirements) • Member in international and European organisations • Waterway administration established and in charge for ensuring good navigation conditions.	• Low capacity utilization of available facilities in ports • Public economic situation • Old infrastructure and superstructure in many ports; old handling equipment and many ports do not have equipment for container handling • Needs for investments in the rail and road connections • Lack of inventory of realistic development needs and plans • Lack of long term port policies and port development strategies • Unsatisfactory coordination between different modes of transport and lack of integrated transport systems; • Lack of Port Community Systems (PCS) • Slow business development • Intermodal transport not developed enough • Insufficient lobbying for ports and IWT • Long transport times • Too strong competition from road and rail links to/from nearby ports for container transports, in terms of distances, prices and regular services. • Lack of resources for maintenance and repair. • Insufficient investment in port infrastructure and new handling technologies.

Opportunities	Threats
• Introduction of businesses/industries into ports • Existence of European funds available for the development of transport infrastructure • Taking advantage of free capacity • Modal split shift • New industrial clusters / Development of clusters to boost competitiveness • Support of the European Union for the development of water transport • Alternative fuels / Eco-footprint philosophy /Decarbonizing strategy • Regional European policies regarding the Danube and Black Sea • "One belt one road" – new transport routes to/from Far East • New markets (biomass, LNG, high & heavy, Ro-Ro, containers, etc.) • Improving shipping conditions (Danube waterway, CEF projects) • Exploitation of the opportunities for cooperation with the port of Constanta as a gate seaport for all Danube ports. • Training of port professionals, training of labour force suitable for any port • Research and design of modern equipment for handling in ports and for container traffic • Modern standards and technology for transhipment in Austria and Hungary as an opportunity for know-how transfer to other countries. • Co-opetition between ports	• Problems with Danube navigability / hydrological conditions • Occurrence of bottlenecks on the fairway (insufficient depths) or in the road / railway connections • The direct competition of rail transport, as well as of the road transport • Competition between ports • Unstable market and demand for port services • Low predictability for traffic demand and economic framework • Bureaucracy • Dislocation of heavy industry • Emigration of industry / Decline in industrial production on the region • Economic situation in the Eastern Europe and global economy • Economic situation of the port operators and service providers • Stricter environmental regulations for ports / Potential new cost of implementation environmental legislation, • Insufficient investment in port infrastructure and new handling technologies • Lack of labour supply • Risk of delay in the implementation of large infrastructure projects • Small market sector

(Source: iC based on inputs from APDM, BPICO, EHOO, MPAC, MT, PAV, PDR, PGA, PoV, VPAS)

12 Conclusions

Ports in the Danube area are conveniently located along an important European multimodal transport corridor, officially titled as the "Rhine-Danube Core Network Corridor". This represents a strength which Danube ports should use as a basis of their future development. This creates a significant number of opportunities for growth and for important financial injections needed for infrastructure development through the European Commission funding (Connecting Europe Facility - CEF funding). All Danube ports are directly connected with the seaport of Constanta, acting as a gate, or the "Rotterdam of the East" for virtually all Danube countries. This gives them a comparative advantage over other transport routes in terms of cost efficiency, generalized transport costs and even cost of externalities. Many Danube ports are already connected with rail and road connections to the rest of the national and European transport networks. This gives them the strength of intermodality which, indeed, needs to be bolstered with adequate modern equipment. Corporatization of port authorities is also seen as one of the strengths on which future development directions should be built, as this port management model provides sufficient flexibility to port authorities to react on market dynamics and changes in demand for different port operating services, including the value added services.

Thanks to the growing reintroduction of industrial production in the ports or in their immediate vicinity, Danube ports have the opportunity to exploit this phenomenon and use it to their own advantage, by offering the industry a quick, competitive and reliable service and the benefits of the economies of scale offered by inland waterway transportation. This implies that the ports efforts are combined with the efforts to improve the navigability, especially in the critical sectors on the Danube and Sava, and thus increase the overall reliability of inland waterway transportation in the Danube area. Regional European policies regarding the Danube and Black Sea represent a very convenient opportunity which Danube ports should make use of in order to create awareness of various stakeholders towards the business opportunities and importance of transport options offered by ports. Additional opportunities at disposal of the Danube port industry are new markets, cargo flows that will emerge along the transport route from the Far East ("One belt one road"), as well as the growing interest of young professionals towards the port industry.

Unfortunately, apart from the above mentioned strengths and opportunities, Danube ports have a number of weaknesses which will need to be neutralized, minimized or completely eliminated when and if possible. Most notable weaknesses focus around the excess capacity or low utilization of the available capacities, as well as lack of resources for provision and improvement of high quality road and rail connections of ports with the rest of the network. Insufficient lobbying for interests of ports is also seen as one of the common weaknesses of the entire Danube port industry. Many ports are in need of heavy upgrade of their old infrastructure and suprastructure, while the funds for maintenance of infrastructure are very limited and are not provided from European funds. Moreover,

Last, but not least, port industry in the Danube area is faced with a number of threats which are external to ports themselves, but which call for measures to mitigate or remedy such threats. Most important threats for the Danube area port industry are still persisting

navigation hindrances along the Danube, overall economic situation in Southeast Europe, fierce competition of road and rail sectors feeding the industrial and commercial sectors along the Danube directly from nearby seaports of Koper, Rijeka, Trieste and even from the farther ports in the Northwest Europe, like Rotterdam, Amsterdam, Antwerp, Hamburg and others. Volatility of the market also represents a serious threat which will be very difficult to mitigate. Even though an increasing number of young professionals take interest in port business, a constant supply of skilled labour, both on operational and managerial level, is still a threat, especially on the long-term run.

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Annexes

Annex I – Cumulative SWOT analysis

	AT	SK	HU	HR	RS	RO	BG
Strengths	• Economic situation • Good location • Heart of Europe (TEN-T network) • Bridgehead function • Logistic competence • Hinterland hubs • Modern standards • trimodality/intermodality • Local traffic connections • Transnational connections • Qualified personnel • Containerized business • Experience in demand driven development • Austrian Danube navigability • Via donau as successful waterway administration	• Strategic geographic location in relation to the location of potential customers' connection to a network of inland waterways of international importance • Shipping costs • Supporting the development of water transport by the European Union	• Good and guaranteed loading and unloading standards • Regular service outside of working time (more flexible than in the western countries) • The geographic location of the ports is logistically mostly favourable • The majority of ports are trimodal • Modern technologies and high capacity loader machines • Small staff • General terms and conditions	• All of the Inland Ports (Including Vukovar and Slavonski Brod) are defined as of State interest which guarantees State investments • Public interest is protected in public ports by law and port authorities • All port users have the same terms in public ports (port dues and accessibility) • Experience in EU projects • Good networking with other inland navigation and port administration institutions along the Danube • Association of Inland Port Authorities	• Port management model • Good strategic position • Good connection with national and international road and rail network • Railway tracks along the quay wall • Experienced and flexible Port Operators • Multimodality • Navigability of the Serbian section of the river Danube	• The use of corporatized port management model, which allows for development in accordance with market requirements • Diverse connections with hinterland area (road, rail) • The availability of a wide range of ship and freight services • An active member in international and European organisations • Conditions for the safe operations of ships • The existence of modern waste reception facilities • Developing partnerships between port operators and the local authorities for port development • Port development projects in progress • Maritime and river ports	• Very favourable geographic location of the country; • Dense transport infrastructure – ports, roads, railways; • Good competition level; • Ongoing measures for port development; • River information system functioning; • Traditional local cargo flow that could not be deviated to competitors; • Free capacity for port services; • Highly qualified personnel.

	AT	SK	HU	HR	RS	RO	BG
						• Rail connection: both European and Russian standard • Strategic position at the Eastern border of the EU • Located on the Pan-European Corridor VII Rhin – Main – Danube waterway, of the TEN-T network plant • Existence of Free Zone • Proactive management for promoting the development projects and applying the principle of partnership at the Port Community level	
Weaknesses	• Low capacity utilization • Capital intensity • Business models • Lack of expansion space • Public economic situation	• Long transport times in water transport low transport capacities of an existing fleet • Weak awareness of the possibilities of use of water transport by	• Road and rail links are cumbersome in most cases • The amount of loadable goods depends on the water level of the Danube; in very low water conditions	• All of the Inland Ports (Including Vukovar and Slavonski Brod) are defined as of State interest which guarantees State investments even for ports that have no	• Port infrastructure • Old equipment • Lack of equipment for waterside handling of containers and heavy weight cargo. • Lack of storage space for	• The lack of a port community-integrated IT system which would allow for the fast and efficient exchange of information between the companies and the	• Unsatisfactory condition of the port infrastructure and the connecting infrastructure; • High handling capacity for cargo types that are

	AT	SK	HU	HR	RS	RO	BG
	• Railway infrastructure • Railway bottlenecks in Austria • Low investment capacity of vessel owners • Small market sector • Insufficient lobbying for ports and IWT • Dislocation of heavy industry • Small strategic dimensions • Slow business development	logistics operators in Slovakia need for multiple transhipment	there are loading problems • There is a limited number of sheltered loads • No equipment suitable for container loading (only in Budapest) • Need of dredging (some ports are not affected) • Decisive role of price	development (or that are of a lower) perspective • There are no clear criteria for inland ports development needs and plans • There are no clear criteria of port categories defining • Infrastructural projects are not prepared for EU funding • Staff in Ministry and port authorities is not educated for big investment projects preparation and implementation • Land within the ports has different owners which demands lots of financial means to solve it • Association of Inland Port Authorities needs a redefinition of activities	agricultural products (silo) • Focused mostly on agricultural products or certain industry in the hinterland	public and private sectors • The lack of a coherent port community, capable to answer promptly to the market request • The lack of logistics centres in the port area • The port infrastructure requires significant development investments • Lack of a masterplan for the port development • Limitations on conditions of navigation in the common sector Romanian-Bulgarian at certain times of the year • Limited supply of logistics services • Insufficient connections to hinterland	constantly decreasing; • Intermodal transport not developed enough; • Low percentage of goods transported by river (both domestic and international); • Unsatisfactory coordination between different modes of transport and lack of integrated transport systems; • Lack of satisfactory number and condition of the covered and specialized port warehouses; • Limited role of the private sector in terminals not granted on concession;

	AT	SK	HU	HR	RS	RO	BG
						• APDM does not have access to the RoRIS system • Insufficient dredging system for keeping water depth in port	
Opportunities	• Decarbonisation • New markets • Eco-footprint philosophy • New city logistics • Alternative fuels • Real estate industry • E-commerce • Physical internet • Rail cargo attractiveness • Agricultural focus • Regionalization of supply chains • One belt - one road • Containerization of cargo • Short distance alternatives • Modal split shift • Infrastructure flexibility • New industrial clusters	• Growing trend in logistics and international goods transport • Increase production of cars and consumer goods in Slovakia • Orientation of the economy of the SR mainly on export	• EU resources are available for port infrastructure development in Hungary • Increase storage capacity • Introduction of businesses/industries into ports • Development of road-rail connections • Construction of covered loaders • Designing modern equipment for handling container traffic • Training of port professionals, training of labour force suitable for any port • Taking advantage of free loading capacity	• Good position of ports Vukovar and Slavonski Brod and good connectivity with mail roads and railways • Good planning of inland ports development • Navigability in Vukovar port for 365 days a year • Accessibility of EU funds	• Rhine Danube Core Corridor Network • One belt one road • Redevelopment of industrial production. • Containerization • Modal shift • Ecological awareness	• Port location on the Silk Road - Europe - Asia Freight Route • Location on a major European transport corridor • Existence of European funds for the development of transport infrastructure • Regional European policies regarding the Danube and Black Sea • Exploitation of the opportunities for cooperation with the port of Constanta	• Optimization of the Danube waterway and increase in domestic and international river transport; • Good opportunities for attracting transit cargo from Western Europe and the Middle East, West and Central Asia; • Establishment of economic zones. Development of clusters to boost competitiveness; attracting foreign direct investment to increase employment; • Concession of terminals that are not currently granted on concession;

	AT	SK	HU	HR	RS	RO	BG
			• Improving shipping conditions (Danube waterway)				• Modernization of the handling facilities and port infrastructure; • Improving security and safety systems in ports
Threats	• Problems with Danube navigability • Stricter environmental regulations for ports • Road & rail competition • Containerization of cargo • Vessel owner community • Bureaucracy • Emigration of industry • Relation with the neighbourhood • Outdated laws • Decentralized production • Public economy • Lack of skilled workforce • International (global) economy • Overcapacity	• The direct competition of rail transport • Dependence of the use of water transport on weather and hydrological conditions • Increased use of rail and road transport • the development of Port of Koper as the main logistic hub for Slovak car factories in maritime transport	• Lack of labour supply • Clients can avoid water transport due to uncertain water levels, and may change to road / rail transport modes • Development of road infrastructure (roads, bridges) near the ports can divert part of the traffic	• Lack of the clear strategies and development plans • Investment projects are not prepared and not ready for the EU funds • Canal Danube – Sava project feasibility • Economic situation in the Eastern part of Croatia reflects on the port development • Some of inland ports have problems with navigation and accessibility for vessels • Port operators depend on economic situation – they are not stabile	• Danube navigability • Unstable market and demand for port services • Road & Railway transportation • Different custom area • Lack of qualified stuff • Global economy	• High delays in the development of the road infrastructure in Romania • Insufficient attractiveness level to invest in Romania • Additional costs generated by the transit of the Danube-Black Sea Canal • Low levels of Danube waters during periods of drought • Navigation restrictions on the Danube during the periods with negative temperatures • Low predictability legal and economic framework	• Significant decrease in the overall river transport in Bulgaria • Risks connected with the active competition of neighbouring states in which transport projects are carried out - alternative to the routes through BG river and sea ports • Outflow of qualified port personnel • Potential new cost of implementation environmental legislation, negative public attitudes of the population on the territory of the area regarding the construction of

	AT	SK	HU	HR	RS	RO	BG
	• Rail bottlenecks					• Decline in industrial production on the region • Critical conditions of navigation on the Lower Danube, and on the River Danube • Competition with other ports	waste treatment facilities. • Insufficient investment in port infrastructure and new handling technologies • Lack of resources for maintenance and repair.