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Danube Transnational Programme
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Danube Port Development Strategy & Network Formation

O.6.1: Danube Port Development Strategy and Action Plan

Work Package 6

Output 6.1

PP Responsible: iC

Date: 10/06/2019

Version 2.0 (FINAL)

Project co-funded by European Union funds (ERDF, IPA)

Interreg
Danube Transnational Programme
DAPhNE

Document History

Version	Date	Authorised
Version 0.1	08/05/2019	iC
Version 1.0	10/05/2019	iC
Version 2.0	10/06/2019	iC

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Executive summary

The aim of the Danube Port Development Strategy and Action Plan is to provide a detailed diagnosis of the current "flaws and virtues" of the Danube port industry, determine its place in the future transport and supply chains, and to define the development (strategic) objectives and the accompanying implementation measures. Being a "crown" of the entire project, the Danube Ports Development Strategy and Action Plan (hereinafter: Strategy), encompassed the inputs from all other work packages and activities through the definition of objectives and measures, as well as their justification.

This Strategy, covering the period of 8 years (2020 – 2027) is divided into an analytical part and a part containing individual strategic objectives and implementation measures for each objective. The SWOT analysis of the Danube region port industry, being an analytical part of the Strategy, was performed using a triple layer – that of individual ports (*first layer*) participating in the analysis, national port industries (*second layer*) and an entire Danube region port industry (*third layer*). 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 the harmonized inputs for the Strategy, 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".

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. 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.

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 the common interests of ports is also seen as one of the common weaknesses of the entire Danube port industry.

Port industry in the Danube area is faced with a number of threats which are external to ports themselves, but which anyway 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 and fierce competition of road and rail sectors feeding the hinterland in the Danube region directly from nearby seaports in the Adriatic and Aegean Sea, and even from the North Sea ports.

Based on the carefully identified and analysed strengths, weaknesses, opportunities and threats of the national port industries, the project team has identified strategic development objectives and adequate development measures needed to ensure the implementation of the objectives. Both objectives and development (implementing) measures are identified on a dual level – national (based on the "Cumulative" SWOT analysis) and regional (based on the "Common" SWOT analysis) level. The latter is applicable to the entire port industry in the Danube Region.

In *Austria*, most of the development objectives are focused on the connection of ports with the new transport corridors from the Far East (China), or the so called "Belt Road Initiative", as well as the improvement of the railway connections, coupled with synergies with the rail cargo business. International (joint) lobbying for the continuous improvement of navigation conditions on the Danube, environmental management systems in the ports and optimization of the use of existing infrastructure are also seen as important objectives. All these objectives require adequate measures, including strong cooperation with national and local authorities, marketing inventory and programs for specific company settlement and implementation of the concept guidelines for industrial development in ports, amongst others.

As for the *Slovak Republic*, development objectives are centred around intentions to improve existing port services, attraction of new companies with new users in ports, increased number of public-private partnership (PPP) initiatives in ports, improvement of multimodal facilities with the goal of increase of combined transportation and increase of reactiveness to public funding opportunities. In order to implement these objectives a number of measures have been developed, including promotion of lease of unused land and facilities, increase of awareness of ports for local economy, introduction of minimum requirements for efficiency of port operators, use of alternative fuels and training and education.

Development objectives in *Hungary* include specific port training of existing and future port workers, attracting industries in port areas, increase of container and Ro-Ro business in ports, introduction of self-regulatory elements of the market to assure transparency and fair competition, innovative funding schemes, clear national strategy for port development and

alike. Hungarian partners proposed to implement the objectives by training and employment standards for ports, increased sharing of good practices, joint promotion and marketing, prioritization of investments in ports, including multimodal investments, etc.

Most important objectives of the port development strategy for *Croatian* ports focus on solving of ownership problems and clear separation of port authority functions and port operating functions, more efficient utilization of available funds for port construction and modernization, elaboration of high-quality port development plans as a basis for concessions and other PPP schemes and increased flexibility of concession agreements. These objectives are coupled with the following measures: finding suitable models and financial schemes for land issues and expropriation, prioritization of port investment projects, preparation of realistic master plans, facilitation of demand-based concession agreements, etc.

When *Serbian* ports are concerned, their most important strategic objectives are creation of conditions for fair competition and equal market opportunities (level playing field), facilitation of settlement of industry in the immediate hinterland of ports, introduction of ports as substantial parts of logistic chains, training of specialized workforce, rehabilitation and modernization of infrastructure and sustainable investments in port infrastructure through efficient PPP schemes. These objectives can be achieved by further licensing of port operators, introduction of single window procedures as much as possible, active participation of port authorities in elaboration of spatial planning documentation, further digitalization of user friendly tools for multimodal transportation planning and port operations, knowledge sharing, promotion of concession-based port development, equipment modernization, more efficient utilization of external funds (EU co-financing) and joint promotion.

In case of *Romania*, objectives of port strategic development are concentrated around initiatives to attract maritime cargo from the Asia-Europe route to the Danube maritime ports, increase of container transhipment in the seaport of Constanta as a Danube region gate, improvement of port infrastructure, elaboration of port master plans, market based strategic development and development of port community. These objectives are planned to be achieved by implementing measures such as: investment in multimodal and transshipment logistics, participation in EU Integrated Maritime Policy projects, master plans implementation, enhancing the value of corporatized port management model, HR strategy as part of the contractual obligations to concession to port operators and active participation in maritime spatial planning in order to be harmonized with port development, inter alia.

Development objectives of *Bulgarian* inland ports are focused on improvement and modernization of port services, further development of port concessions in order to increase the efficiency of ports, attract non-public investments and private sector know-how, modernization of infrastructure enabling it to attract additional cargo flows, improvement of intermodal transport coordination in ports, keeping highly qualified port specialists in the port industry and introduction of an integrated transport system. Implementation of these objectives is planned to be facilitated by completion of concession procedures for remaining river ports, incentives for port modernization, tailor-made modernization measures for each port, realistic forecasting, specialized education and training for ports, integration of RIS

services in Bulgaria with new and existing information/management systems in various transport modes, etc.

From the aspect of *common development of the entire port industry in the Danube area*, the following objectives, *inter alia*, have been agreed on multinational level: connection of ports to "Belt Road Initiative", increased use of EU funds for port development and hinterland connection, further "greening" of ports and port operations, focus on multimodality, expansion of scope of services, optimization of land, facilities and available space, reduction of bureaucracy, mitigation measures to combat market volatility, creation of long-term port policies, fostering co-opetition between ports and attraction of new markets. Measures aimed to facilitate the realization of these objectives include, *inter alia*: investigation of options for connecting the Danube ports to the corridors running from China, via Port of Constanta, increase of project maturity to increase the odds for obtaining the co-funding from EU funds, identification of business and market segments where ports can cooperate for the common good, create joint commissions with spatial planning institutions in order to ensure that the port land is extended and that the land becomes available for industrial and logistic operators, apart from port/terminal operators, introduction of new services in ports, developing concepts of "flexible" inland ports and "flexible" concessions, harmonization of documents for ships and cargo, formulation of flexible strategies, functional and active association for port networking, application of IWT/Port Single Window Systems, promotion of ports as strategic objects of national transport infrastructure and protection of public interest and public domain in ports.

Since their third generation, ports are extending their service portfolio towards the wide array of logistics and value added services for vessels and cargoes. By doing so, ports are integrating themselves into supply chains. Integration of ports into supply chains is done through intermodality and organisational integration. Intermodality is known to simplify cargo handling and reduce damages, losses and dwell times, altogether leading towards faster, more reliable and more cost efficient transport.

Since many successful ports count on various level of industrial and logistic activities in or adjacent to port areas hence this report contains various approaches on how to attract more industrial and logistic activities. These activities need to be either integrated in port activities or to be very closely correlated with them in order to benefit from synergies, concentration of vehicles and cargoes, intermodal options for cargo distribution, as well as from the spatial concentration of production, transport and logistic activities.

It is very important to avoid a common mistake of comparing the Danube ports with the Rhine ports when defining the Danube port strategy. Many Rhine region ports are largely focused on container traffic to/from main gateway ports in the North Sea. Quite the contrary, regular containerized cargo flows converging in the Danube ports from IWW are virtually non-existent. Different geographical distribution of cargo flows, different levels of quality of transport infrastructure of various modes, including the capacity of the hinterland access, have a crucial role in development of inland ports. Therefore, *no Europe-wide one-size-fits-all strategy for inland ports development could be really useful since the differences in regional effects, geography and trade patterns remain fundamental*. Unlike the Rhine ports, only a few

of the Danube region ports are focused on container logistics. Even these ports handle containers flows mostly from rail (and partly road) transport to/from North Sea and Adriatic ports, while currently no Danube port handles containers flowing in/out of ports using regular liner IWT services on the Danube. Consequently, the Danube port authorities should adapt their planning and land use in such way to secure enough space to attract and accommodate intermodal terminals which are primarily rail-road intermodal (bi-modal) terminals, offering them the necessary space, but also a direct access to the waterway as a value added. However, in order to prevent the occupation of the berth line with the cargo which uses only rail and road transport, such terminals should be equipped for handling any compatible type of conventional cargo at the same berth line. Facilitating the intermodality in such way is expected to trigger the spatial concentration effects and thus attract containerized cargo into ports and thereafter, when/if the critical mass is reached, to trigger the demand for inland waterways transport of containers in those ports from/to which such transport is economically justified.

Globalization and the modern age have put a tremendous pressure on port authorities. In order to survive and thrive, port authorities should become less static and think “out of the box”. This means that port authorities should widen their scope beyond that of the traditional facilitator with the centuries old focus on the provision of basic and operational infrastructure and facilities for transshipment and storage. Modern waterborne logistics, transportation and port operations dictate that ports should have a new strategic role to play in land use planning, facilitation of the relocation of production, manufacturing and logistic facilities in or near port areas, supply chain integration, information systems and intermodality/multimodality. This role requires networking, not just between ports, but also between ports and other nodes, operators and market players. Although it may not be a universal panacea for ports, going beyond the limits of the port area in terms of physical interventions and organisational capabilities along supply chains stands good chances to gain competitive advantage for ports in the medium and long run.

New roles for the Danube ports can be fulfilled by implementing the objectives and measures developed in this document.

1 Introduction

This report represents the comprehensive outcome not just of the Work Package 6 "Danube Port Development Strategy and Network Formation" of the Danube Ports Network (DAPhNE) project, but also of the entire project, since it encompasses the findings of virtually all work packages of the project.

Due to various economic, geo-political and political reasons, the Danube region port industry is, putting it directly, lagging behind its counterpart in the Western Europe. True, the situation in the port industry largely reflects the overall economic situation. Nevertheless, the ports have the insufficiently used potential to become engines of growth of the regional economies, instead of just "*serving*" the economy. For this reason, this potential needs to be thoroughly investigated, analysed and accompanied with a set of measures conveniently designed in such way to turn this growth generating potential of ports into tangible results. The most appropriate way for making use of the unexplored potential of Danube ports is to prepare the Danube Port Development Strategy and Action Plan (hereinafter: Strategy) which can be used both on individual (national) level and on the regional, or "common" level.

The Strategy is prepared for the period of 8 years (2020 – 2027), in order to conveniently match the next financing period of the European Commission's Connecting Europe Facility (2021-2027). The Strategy is divided into two complementary parts: an analytical part containing the "triple layer" SWOT analyses and a part containing individual strategic objectives and implementation measures for each objective in each participating country and in the entire Danube region.

The information gathered in other work packages, such as, *inter alia*, info on the port legislation specificities in the Danube region, the public funding aspects, the administrative issues as well as the port development issues, were used to prepare the first layer of SWOT analysis of the Danube region ports, on the basis of the representative sample of 21 inland and seaports. 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 national port industries, taking into account the internal (with respect to the port industry) strengths and weaknesses and external threats and opportunities. These national port industries SWOT analyses represent the second layer of the SWOT analysis. Thereafter, the third and the final layer of the SWOT analysis is elaborated, containing the elements common for the entire Danube region port industry. National and regional (or "common") SWOT analysis were used as a diagnostic tool and as an input for the Danube Ports Development Strategy and Action Plan on both national and common levels, respectively. The "triple layer" approach for the SWOT analysis is arguably the most convenient way to obtain a fairly accurate picture of the current situation and possible development vectors of the ports in the Danube region.

Well identified strengths, weaknesses, threats and opportunities in the Danube region ports serve as an excellent basis for the definition of relevant strategies, or strategic objectives, which are then accompanied with adequate implementation measures needed to achieve the given objectives. Objectives need to be defined in such way to enable the ports to use their

internal strengths to take advantage of opportunities and to use their strengths to minimize threats. In addition to this, smart strategies contain objectives which use the opportunities to improve the weaknesses, while at the same time including measure to eliminate weaknesses and thus avoid threats.

Moreover, the contemporary age, globalization and the regional distribution of trade patterns under the conditions of fierce competition from the road and rail transport in the Danube region, even for the traditional mass cargoes being transported in the region, put an enormous pressure on port authorities. Cosy assumption of the role of trade facilitators for century old supply chains of coal, ores, wheat, steel products, oil products and fertilizers is no longer enough, as other modes have long ago taken the lead in innovations and are taking over ever larges shares of traditional inland waterway transportation (IWT) cargoes. In order "survive and thrive", Danube ports need to adapt not just to the roles being imposed by contemporary trade, but also to assume new roles in such way to be the proactive drivers of the change, instead of just responding reactively to ever changing conditions in inland waterway transportation and intermodal/multimodal transport chains. The main goal of this strategy is to provide the objectives and implementation measures suitable to enable the Danube ports to assume such roles.

Last, but not least, the successful Strategy needs to be prepared by the ports for the ports. This document is written taking this approach into account from the beginning to the end.

1.1 Structure of the report

The report consists of nine chapters. First chapter is an introductory chapter briefly explaining the place of this study within the Daphne project and introduces the reader to the analytical and strategic setup of the strategy, including the new role of the Danube ports. Second chapter deals with the SWOT analysis as a basis for development strategies and as a decision making tool. The third chapter contains the SWOT analysis of the national port industry of participating countries, while the fourth chapter deals with the common (regional) SWOT analysis of the entire Danube region port industry as a whole. Chapter five, elaborates on the prospects for ports in the Danube region, analysing the current position of seaports and inland ports, as well as the new role of ports in the globalized and digitized supply chains. The sixth chapter briefly explains the methodology for the identification of strategic objectives, while the seventh chapter dives deep into the identification of objectives and development measures necessary to be implemented in order to achieve the identified objectives for all riparian countries. Chapter eight defines the common (regional) mission, vision, core values, objectives and measures of the entire Danube region port industry. Finally, the ninth chapter contains the concluding remarks.

2 SWOT Analysis as a basis for development strategies

2.1 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.

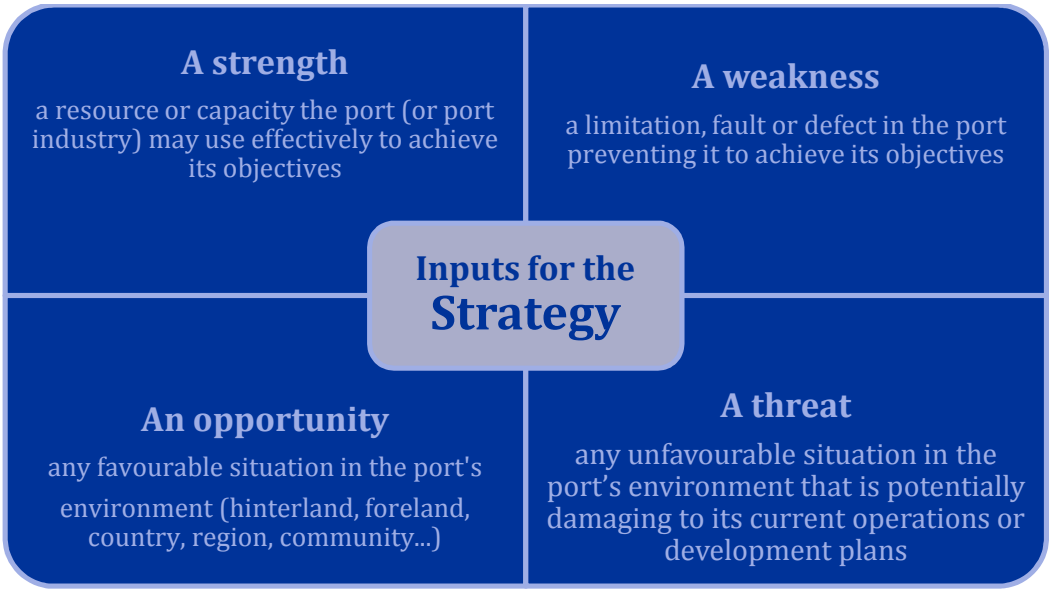

Figure 1: SWOT elements as inputs for development strategies

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)

2.2 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.

2.3 Rationale for the applied method of port industry analyses

The SWOT analysis of the Danube region port industry, being an analytical part of the Strategy, is performed using a *triple layer* approach – that of individual ports (*first layer*) participating in the analysis, national port industries (*second layer*) and an entire Danube region port industry (*third layer*). A total of 21 ports in the Danube region were subject to SWOT analysis[1]. Based on these 21 SWOT analyses, 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 Strategy, 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".

[1] Group of authors (2018), *Danube Ports SWOT Analysis*, Daphne project, WP6, Deliverable D.6.1.1

This document will contain only the *second* (national SWOT analysis) and the *third* (the Danube region port industry SWOT analysis, or the "Common SWOT analysis) layer, while for the SWOT analysis of individual ports the reader is referred to the Deliverable 6.1.1 "Danube Ports SWOT Analysis", of the Daphne Project.

3 SWOT analysis of the national port industries

3.1 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 nation-wide SWOT analysis of Austrian port industry.

Table 1: 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 • via donau as successful waterway administration	• 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
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)

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.

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.

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.

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.

3.2 Country-wide SWOT analysis of the Slovak port industry

Table 2 contains the strengths, weaknesses, opportunities and threats identified as the common ones for the entire port industry in the Slovak Republic.

Table 2: 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)

3.2.1 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 environmentally friendly transport is the industry of ports the most supported field of industry and transport.

3.2.2 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).

3.2.3 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.

3.2.4 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.

3.3 Country-wide SWOT analysis of the Hungarian port industry

Common strengths, weaknesses, opportunities and threats of the Hungarian port industry are given in Table 3.

Table 3: 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)

3.3.1 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.

3.3.2 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.

3.3.3 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.

3.3.4 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.

3.4 Country-wide SWOT analysis of the Croatian port industry

Table 4 contains the strengths, weaknesses, opportunities and threats identified as the common ones for the entire port industry in Croatia.

Table 4: 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)

3.4.1 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.

3.4.2 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.

3.4.3 Opportunities

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

3.4.4 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, the traffic volumes in ports would

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”.

3.5 Country-wide SWOT analysis of the Serbian port industry

Table 5 contains the strengths, weaknesses, opportunities and threats common for the entire port industry in Serbia.

Table 5: 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)

3.5.1 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.

3.5.2 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.

3.5.3 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.

3.5.4 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.

3.6 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 6: 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 (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 & Russian gauge • Strategic position at the Eastern border of the EU • Located on the Pan-European Corridor VII Rhine – Main – Danube of the TEN-T network • Existence of Free Zone • Proactive management for promoting the development projects and applying the principle of partnership at the Port Community level	• 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
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 • Additional costs generated by the transit of the Danube-Black Sea Canal • Low levels of Danube 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)

3.6.1 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.

a. 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.

b. 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.

c. 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.

d. 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.

e. 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.

f. 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.

g. 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.

3.6.2 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.

3.6.3 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.

3.6.4 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.

a. 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.

b. 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.

3.7 Country-wide SWOT analysis of the Bulgarian port industry

Common strengths, weaknesses, opportunities and strengths for the Bulgarian inland ports industry are summarized in Table 7.

Table 7: 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; • Modernization of the handling facilities and port infrastructure; • Improving security and safety systems in ports	• 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 waste treatment facilities. • Insufficient investment in port infrastructure and new handling technologies • Lack of resources for maintenance and repair.

(Source: BPICO)

3.7.1 Strengths

S.1: There are FIVE trans-European transport corridors passing through Bulgaria - No IV, VII, VIII, IX and 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 3: 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.

3.7.2 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.

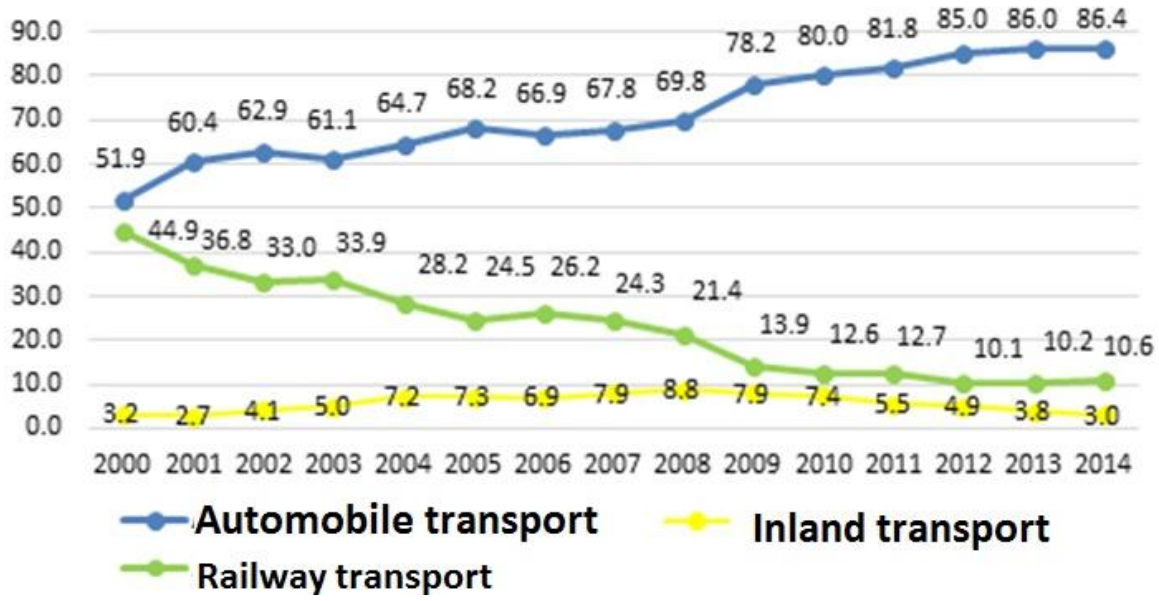

Figure 4: Modal split of transports in Bulgaria

(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 have their own commercial and management policy. 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.

3.7.3 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.

3.7.4 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.

4 Common SWOT analysis of the Danube port industry

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. The "common" SWOT will serve as a basic input for the Danube Port Development Strategy & Action Plan as.

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" is used for national port development strategies which are included in this document, in addition to the "overall" Danube ports industry "Common SWOT analysis".

Table 8 contains a "Common SWOT analysis" for the entire port industry in the Danube region.

Table 8: 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)

5 Prospects for ports in the Danube region

Both seaports and inland ports, in spite of their differences, represent the main and important gateways and nodes of the Trans-European transport network, respectively. Their management and operation, although very similar in general, have their own peculiarities and specificities.

5.1 Current position of seaports and inland ports in the Danube region

When seaports are concerned, the Danube region basically has one main seaport having a direct link with the Danube waterway – the seaport of Constanta. Nevertheless, it is not the only sea "gateway" to the Danube region. In fact, fierce competition for the same hinterland (Danube riparian countries) comes from the Adriatic and Aegean seaports, and, to a certain extent, even from the North Sea ports. Adriatic (Trieste, Koper, Rijeka, Bar) and Aegean seaports (Thessaloniki, Piraeus) do not have direct IWW connection with their hinterland in the Danube region countries. In spite of that, their competitiveness and, in many cases, comparative advantage over the port of Constanta which does have direct IWW hinterland connection, lays in the fact that those ports have more direct maritime transport lines with, say, Far East – the origin of the most of overseas imports into the Danube region. In addition, rail and road services from these ports, and even from the North Sea ports, are very competitive in terms of transit time and cost, when compared to barging services (when they existed) from Constanta and back. This situation refers mostly to high-value and unitised (containerized) cargoes. On the other hand, when conventional cargo is in question, the seaport of Constanta is very competitive when compared to other ports.

Due to their size, physical limitations for vessels and their geographical position away (mostly deep inland in the continent) from the maritime trade routes, inland waterway ports are planned, managed and operated in a different way from seaports. Operationally, inland ports function pretty much like seaports: ships are arriving to port, loading/unloading takes place, cargo is thereafter being handled in the handling yards and/or in the storages, warehouses and transit sheds, or directly delivered to/from land transportation means (trucks and/or wagons). In addition, value added services are being offered for both cargo and ships.

Most of the EU inland ports development strategies and policies are based on the challenges, issues, trade patterns and transportation geography of inland ports of the Western Europe. This can be easily noted upon having a quick glance at any position papers of various IWW and inland port organizations/associations on any policy/regulatory document of the European Commission, as many of them are almost always focused on intermodality and unitised cargoes and optimisation of their flows to/from main gateway ports in the North Sea. Quite the contrary, containerized cargo flows converging in the Danube ports from inland waterways are virtually non-existent. Reasons for that are numerous and beyond the scope of this report, but the main issues of the lack of success of any regular container flows on the Danube and its navigable tributaries are the following:

Factors causing the non-existence of Danube-based intermodal services along the waterway

- Lack of proper waterway maintenance (critical shallows on the Bulgarian-Romanian common sector, unstable fairway axis in the Apatin sector between Serbia and Croatia, etc.);
- Pure geographical reasons;
- Low level of containerisation of cargoes;
- Strong competition from rail, and even trucks from Adriatic ports and even North Sea ports, in terms of freight rates and transit time;
- "Two container layers cover the costs, the third one makes money" - attitude of ship owners;
- Lack of large multi-modal logistic parks in ports;
- Lack of vertical and horizontal integration in shipping and port industry;
- Lack of adequate barge operators;
- Lack of modern and dedicated intermodal facilities in ports;
- Maritime trade patterns changed;
- Lack of attractiveness of port/shipping sector;
- Lack of government stimulation policies;
- Cumbersome border procedures along the Danube (Serbia) causing delays;
- Extremely long distances from Constanta seaport as a gateway (Belgrade – 900 km, Vukovar – 1100 km, Budapest – 1400 km, Bratislava – 1630, Vienna – 1680, Regensburg – 2130 km, etc.), especially in comparison with the container liner shipping on the Rhine where the farthest port from, say, Rotterdam as a sea gateway, is Basel (900 km);
- Complicated and costly back up haulage options in case of navigational hindrances;
- Negative experiences with previous container liner services operating on the Danube (Bulgarian River Shipping / Jugoagent and Helogistics / Jugoagent).

In this view, it is necessary to assess what might be the prospects for Danube ports under the circumstances which are not favourable (to say the least) for the IWW-based intermodal transport and regular container services on the waterway itself.

Another important prospect for the Danube ports may be focused on specialisation, even in the case of relative lack of spatial concentration of ports in certain areas. In general, two kinds of port specialisation may happen. The more obvious specialisation can be seen in the emergence of a small number of niche ports/terminals that specialise in handling specific cargo (including niche cargo) and perhaps a few other commodities. The subtler specialisation is the process whereby cargo shippers/receivers tend to concentrate the bulk of their operations in fewer ports. Ports can also tend to specialise their cargo handling operations around a smaller number of cargo owners.

5.2 New role for seaports and inland ports in the Danube region

When seaports are in question, the only and the most important seaport participating in this study is Constanta. In order to keep the competitive edge, the Port of Constanta as the main sea gateway for the Danube inland ports should focus its efforts on providing the adequate infrastructure and services in order to avoid bottlenecks in waterside handling, land operations (yard handling, warehouse facilities, reception and delivery facilities, etc.) and its road, IWW and rail connections to the port's hinterland.

The new TEN-T Guidelines[2] can be very helpful in achieving the above goals, as it provides the regulatory framework for the support to seaports to become part of a unified network boosting growth and competitiveness in Europe's Single Market.

On 23 May 2013, the Commission adopted an initiative[3] aimed at improving port operations and onward transport connections at the 329 key seaports (out of which 104 core ports) which belongs to the trans-European transport network. This initiative is progressively implemented through a set of legislative measures and non-legislative measures as follows:

- *Regulation (EU) 2017/352 of the European Parliament and the Council of Ministers establishing a framework for the provision of port services and common rules on the financial transparency of ports.*

The idea behind this Regulation is to provide the level playing field in the port sector, protect port operators against uncertainties and create a climate more conducive to efficient public and private investments. The Regulation identifies the conditions for the freedom to provide port services, such as the type of minimum requirements that can be imposed for safety or environmental purposes, the circumstances in which the number of operators can be limited and the procedure to select the operators in such cases. Moreover, it introduces common rules on the transparency of public funding and of charging for the use of port infrastructure and port services, notably by making sure that the port users are consulted. It introduces in each Member State a new mechanism to handle complaints and disputes between ports stakeholders. Finally, it requires all port services providers to ensure adequate training to employees.

- *Application and modernization of the State aid rules, in the context of the competition policy.*

This measure includes the case-law and decision database for the decisions involving ports. In May 2016 the Commission published the Notice on the notion of State Aid[4], which explains when public investments are not considered State aid. An Analytical grid for ports infrastructure was published on 2 December 2016 to provide further guidance on the rules

[2] Ibid.
[3] https://ec.europa.eu/transport/modes/maritime/ports/ports_en
[4] Commission Notice on the notion of State aid as referred to in Article 107(1) of the Treaty on the Functioning of the European Union (2016/C 262/01)

and case practice applicable in the port sector. In June 2017, the Commission an amendment[5] of the General Block Exemption Regulation. The new regulation gives more flexibility to Member States to decide public funding of certain port investments without the obligation to notify the Commission and request its approval.

- *Promotion and support of the European social dialogue between port workers and their employees and of training.*

The main aim of the Commission is to facilitate and encourage the EU Social Dialogue Committee in the Port Sector to work on health & safety, training and qualifications, gender issues and promotion of female employment and attractiveness to young workers. Representatives of port employees and port employers work together for instance to produce common guidelines for training as well as national health and safety requirements.

- *Support to better planning, financing and funding of port infrastructure and their connexions in the trans-European network.*

The Commission has integrated ports in the corridor work plans foreseen by Article 46 of the new TEN-T Guidelines for the development of the Trans-European transport network (Regulation 1315/2013) and provides targeted grants and other forms of financial supports to port infrastructure projects by using the Connecting Europe Facility. More than € 1 billion have already been awarded since 2014 to support rail or inland waterways connecting ports with the hinterland, basic port infrastructure, innovation and green port projects.

- *Initiatives to simplify procedures in ports.*

Efficient turnaround time of ships in ports and cargo throughout require not only efficient infrastructure, but also efficient information processing and administrative procedures. For this purpose, the Commission aims to establish a European Maritime Single Window environment with technical and legal frameworks for the submission and re-use of regulatory reporting information, including the e-Manifest information for customs.

- *Initiatives to raise the environmental of ports by promoting the exchange of good practices.*

As part of its research and innovation agenda the Commission launched in 2016 the "Port of the Future" call as part of the Horizon 2020 programme to encourage innovation in ports and the links with port cities.

In addition, from the managerial and operational point of view, the role of Constanta seaport in the future could be that of the facilitator of the entire supply chain. This could be achieved by the integration of the port into the supply chain.

[5] Commission Regulation (EU) 2017/1084 of 14 June 2017 amending Regulation (EU) No 651/2014 as regards aid for port and airport infrastructure, notification thresholds for aid for culture and heritage conservation and for aid for sport and multifunctional recreational infrastructures, and regional operating aid schemes for outermost regions and amending Regulation (EU) No 702/2014 as regards the calculation of eligible costs

Why would this be beneficial for the seaport of Constanta? Contemporary seaports, especially those off the busiest maritime trade routes (e.g. Far East – North Sea ports) are progressing towards "more than just piers" operating philosophy. This means that, since their third generation,[6] ports are extending their service portfolio towards wide array of logistics and value added services for vessels and cargoes. By doing so, ports are integrating themselves into supply chains. Integration of ports into supply chains is done through intermodality and organisational integration. Intermodality is known to simplify cargo handling and reduce damages, losses and dwell times, altogether leading towards faster, more reliable and more cost efficient transport. *Integration of ports into supply chains is not an exclusive development option for seaports, but it can also be applied in inland ports.*

Contemporary ports, from the 3rd generation on, are developing intermodal capabilities for their successful integration into supply chains. To be successful, ports (inland and sea) need to develop relevant organizational cooperation and efficiency[7]. Thanks to their function as an interface between different transport modes, ports are ideal nodes for the interaction of various stakeholders participating in different supply chains where they all converge and, inter alia, add value to cargo through various value added logistics services. Since ports add value to cargo, they are not just a part of the transport chain, but also an important node in the overall production and logistic process in the world-wide supply chain[8]. Basic characteristics of a port well integrated in the supply chain are seamless communication, elimination of wastage, reduction of operation costs by applying the Just-In-Time concept, interconnectivity and interoperability of modal infrastructure and operations, provision of value added services and customer satisfaction.

There are four indicators which can be very useful in assessing the level of integration of ports in supply chains: *port community systems (PCS)*, *value added services (VAS, a.k.a. value added logistics – VAL)*, *intermodal facilities and operations (IFO)* and *supply chain integration services (SCIS)*. These indicators (Figure 5) are largely in the function of port's strategic development objectives or port development vectors.

[6] UNCTAD (1994) The trading port - the prospects of the ports of the third generation. Available at https://unctad.org/en/PublicationsLibrary/tdc4ac7_d14_en.pdf Accessed 26 March 2019.
[7] Morash, E.A. and Clinton, S.R. (1997) "The role of transportation capabilities in international supply chain management", *Transportation Journal*, Vol.36, No.3, pp.5-17
[8] Bichou, K and Gray, R. (2004) "A Logistics and Supply Chain Management Approach to Port Performance Measurement", *Maritime Policy and Management*, Vol.31, No.1, pp.47-67

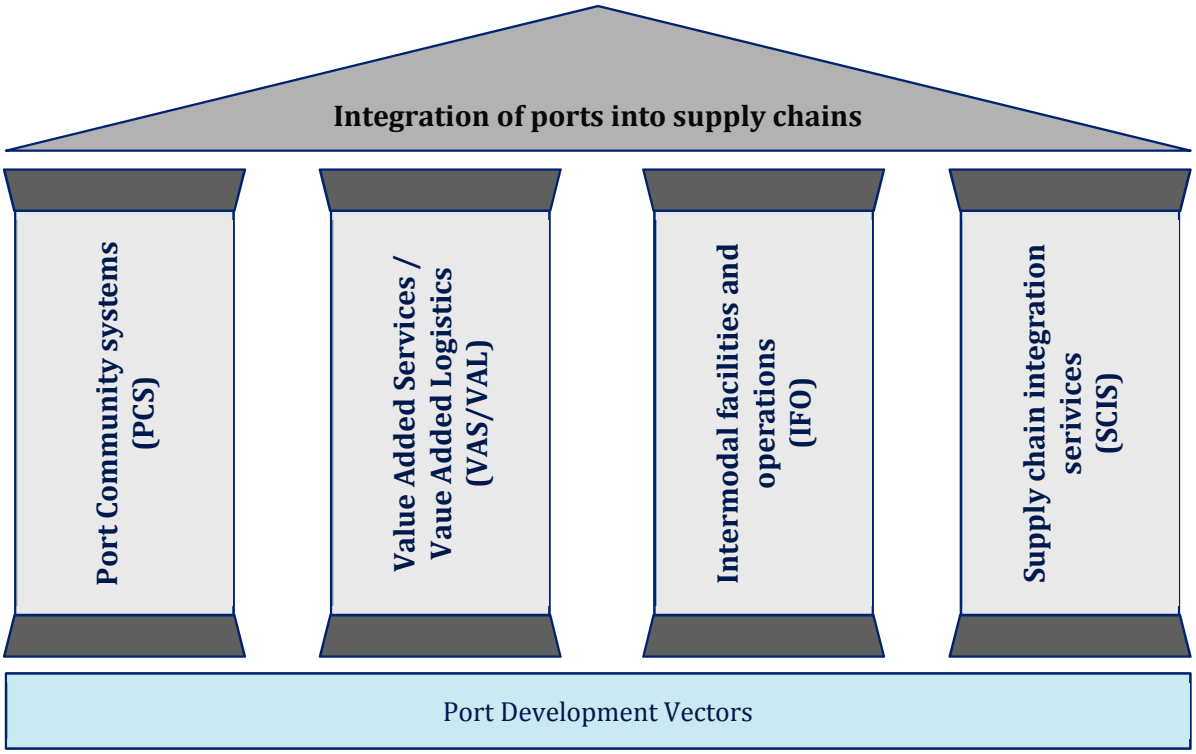

Figure 5: Four indicators determining the integration of ports into supply chains

Port community system (PCS), according to International Port Community System Association (IPCSA)[9], is a neutral and open electronic platform enabling intelligent and secure exchange of information between public and private stakeholders in order to improve the competitive position of the sea and air ports' communities. This system optimises, manages and automates port and logistics processes through a single submission of data and connecting transport and logistics (supply) chains. Information sharing among PCS represents a building block of a sustainable supply chain relationship. Information share causes strong supply chain integration as it enables participants' organizations to improve reliability, interdependencies and speed PCS in the supply chain positively affect supply chain performance from the cost and service level point of view. The need for a standardised communication platform in order to improve the systems in terms of punctuality, reliability or costs, as well as the need to increase competitive position among ports are the key drivers of PCS.

Value added services (VAS), or value added logistics (VAL), represent the port's capability to add value to the services that the port provides so as to facilitate the objectives of the overall supply chain. Ports providing VAS/VAL are part of a value-driven chain. Therefore, by providing value added services, ports add value to the cargoes passing through them[10]. The scope of value added services, including the necessary facilities determine the level of

[9] https://ipcsa.international/pcs, accessed 5 April 2019.
[10] Robinson, R (2002) "Ports as elements in value-driven chain systems: The new paradigm", *Maritime Policy and Management*, Vol.29, No.3, pp.241-255

integration of ports in supply chains. These value added services may include pre-assembly, procurement, distribution, constant stock replenishment, cross-docking, etc. The more flexibility in service provision ports show towards the specific needs of different market segments and different customers, the better their integration into supply chains.

Intermodal facilities and operation (IFO) encompass physical facilities and organisational activities enabling effective and efficient intermodal and multimodal operations. Efficiency of these operations is of great importance, especially in container shipping. Since ports are bi-directional logistics systems (ship-to-shore and shore-to-ship cargo flows), seamless operations require a high level of coordination, interconnectivity and interoperability within the port. Naturally, this requires a physical presence of adequate port infrastructure.

Supply chain integration services (SCIS) encompass the "intensity" of activities, processes and procedures beyond the borders of port area which the port plans, organizes and monitors in supply chains. These service are, for example, the participation of the port (port authority and/or port operators) in shuttle train services to/from the hinterland together with terminal operators, rail operators, forwarders, logistic companies and even shippers/receivers of cargo. Furthermore, this involves an active cooperation with all other actors in the supply chain for the purposes of identification of adequate logistic solutions that would enable the cost efficient and reliable cargo flows throughout entire supply chains.

From the viewpoint of scope and complexity of services offered in ports, they can be distributed into various port "generations". In order to be able to analyse the prospects for the Danube region ports, these port "generations" should be examined.

Ports represent strategic nodes facilitating cargo flows in international distribution of goods, as a part of an extensive logistic network which enables trade and information flows between different points. The ports have evolved in all possible aspects and scholars today differ five port generations according to the scope of the services provided in them. First three port generations have been defined by UNCTAD[11], the fourth was elaborated by Alderton[12], while the fifth port generation was proposed by Flynn and Notteboom[13], and Lee and Lam[14].

First generation of ports, before 1960, were rather limited to simple services of cargo transshipment from ship to shore and vice versa. There was no or very limited cooperation between the port and local authorities and the different port activities were isolated from each other. Typically, such ports usually handled bulk, breakbulk or liquid bulk cargo.

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[11] UNCTAD (1994) The trading port - the prospects of the ports of the third generation. Available at https://unctad.org/en/PublicationsLibrary/tdc4ac7_d14_en.pdf Accessed 26 March 2019.
[12] Alderton, P. (2008). *Port Management and Operations*, 3rd Edition, Informa, London.
[13] Flynn, M., Lee, P., Notteboom, T., (2011) The next step on the port generations ladder: customer-centric and community ports, in: Notteboom, T., *Current Issues in Shipping, Ports and Logistics*, University Press Antwerp, Brussels 2011, p. 503
[14] Lee, P., Lam, J. (2016) Developing the Fifth Generation Ports Model, in: *Dynamic Shipping and Port Development in the Globalized Economy*, ed. P. Lee, K. Cullinane, Palgrave Macmillan, London, p. 188

Second generation of ports, after 1960ies, were somewhat more developed as a transportation hub and centres of industrial and commercial activities. Port services offered in such ports still included primarily services related to cargo and ships, but in their immediate vicinity industries (manufacturing, processing, etc.) are settled and ports start offering commercial services to its users which are not directly connected with simple cargo handling from ship to shore and vice versa. Port policies in such ports start including broader concepts and innovative management attitudes (commercialization, corporatization, outsourcing, etc.). Second generation ports develop closer relations with transport and trade stakeholders who start locating their cargo processing facilities in the port area or in their immediate vicinity. Still, only large companies take benefits from this management reforms. Last, but not least, connections and functional relations between ports and their host cities become more developed and intensified.

Third generation ports, after 1980ies, include logistic services in relation to cargo distribution, data processing and increased use of telecommunication systems. In this period, ports are increasingly open to new operating possibilities and are open to private sector participation in port operations. Services and activities become specialized, numerous but integrated and more customer-oriented, while customs procedures are somewhat simplified. Thanks to these features, the ports start adding more value to cargo, apart from simple loading/unloading, through cargo consolidation and deconsolidation, tracking and tracing, labelling, weighing, stuffing/unsnuffing containers, etc.

Fourth generation ports, after 1990ies, becomes affected by globalization, which, inter alia, causes standardisation of information and procedures, port networks formation and higher environmental impact on port planning and operations. In addition, such ports dedicate a lot of efforts to the increase of the service quality, use more automation, especially due to higher share of unitized cargo and employ trained workforce. Ports of the fourth generation pay much more attention to intermodalism and integrated logistics services. Many seaports foster regular rail or inland waterway lines to inland ports thus integrating both sea and inland ports into international transport, logistic and supply chains and door to door services. Moreover, ports belonging to this generation, are strongly dedicated to improvement of their road, rail and IWW connections (for seaports) to their hinterlands and the rest of the main transportation networks. Further development of the logistic function of those ports included creating duty-free zones (special economic zones, freight villages, etc.) and logistic parks within or near the port areas.

Fifth generation ports started emerging after 2010, when ports started focusing even more on customers and the local community offering deep IT integration with various stakeholders. IT solutions are increasingly used for prediction of different events and measuring performance. Very important characteristics of the fifth generation ports is an active involvement of the port and local community in planning and decision making processes. In addition, these ports are becoming full industrial centres (manufacturing, processing and logistic industries) with comprehensive intermodal transport handling and high-tech logistic centres as nodal and connecting points for intermodal transport, offering advanced special economic zones related services and logistic park functions. The customer-centric orientation of fifth generation ports is reflected in thorough analysis of the dynamic customers' needs and

in being solution-focused in order to keep the existing and capture new port users. Fifth generation ports have a common vision of being "a commercial oriented, integrated transport, logistic and information complex network"[15]. It could be added here that adding a special economic zone (industrial zone under special economic regime, free zone, logistic park, freight village, etc.) in or near the port area would only boost the realisation of such vision in a win-win situation for all stakeholders. The shift from the fourth to the fifth generation ports requires networking (of all port and port related functions) where three key interfaces[16] can be identified:

- interface between the customer and the port system – customer focus needs to allow for a both way approach, meaning that the customer needs to be enlisted as a partner to change determined practices that can hinder an optimized network and capacity management plan;
- interface between commercial and production teams;
- interface between the port and its intermodal connections.

In order to successfully move towards the fifth generation port, port management needs to work on all three interfaces around the clock, setting the provision of services with best prices and highest quality in the environment of finite resources as its prime objective.

Basic characteristics of all five generations of worldwide ports are summarized in Table 9.

[15] Flynn, M., Lee, P., Notteboom, T., (2011) The next step on the port generations ladder: customer-centric and community ports, in: Notteboom, T., *Current Issues in Shipping, Ports and Logistics*, University Press Antwerp, Brussels 2011, p. 503.
[16] Ibid.

Table 9: Main features of five port generations

	First generation	Second generation	Third generation	Fourth generation	Fifth generation
Timeline	<1960	>1960	>1980	>1990	>2010
Main cargo:	Break bulk and bulk	Break bulk and bulk	Break bulk and bulk, unitised cargo	Largest share of unitised cargo	All cargoes (not applicable only to container ports)
Attitude and strategy of port development	Conservative. Simple transshipment point.	Expansionist. Transport, industrial and commercial centres	+ Commercially oriented. Integrated transport node & logistic centre.	+ External networking. More sophisticated use of automation.	+ Customer oriented. Advanced free trade zone and logistic park functions.
Activities array	Loading/ unloading	+ Cargo transformation and industrial activities	+ Cargo & info distribution. Full logistic potential	+Standardisation of information	+ Event management, anticipation and performance measurement.
Organisation features	Independent activities, no links between them. Informal relations.	Closer relationship to port users. Limited interdependence of port activities. Loose relationship with host cities.	United and integrated relationships. Private sector participation in operations.	Globalisation of port communities. Greater environmental control	Internal and external networking. Active consultation of community in planning and decision making processes.
Production features	Simple cargo flows. Low value added.	Cargo flows and transformation. Combined services. Improved value added	Cargo & info flow and distribution. High value added.	Emphasis on quality of service and trained work force	+ Adaptability to demand dynamics, customer satisfaction measurement, customer involvement as partners.
Decisive factors	Labour & capital.	Capital.	Technology & know-how	Information technology	Networking and capacity management.

(Source: iC, based on Flynn[17], et.al. and Alderton[18])

[17] Flynn, M., Lee, P., Notteboom, T. (2011) The next step on the port generations ladder: customer-centric and community ports, in: Notteboom, T. *Current Issues in Shipping, Ports and Logistics*, University Press Antwerp, Brussels 2011, p. 503.
[18] Alderton, P. (2008). *Port Management and Operations*, 3rd Edition, Informa, London.

The fifth generation ports, thanks to the complexity of activities handled in them, have the largest potential for creating value added, as demonstrated in Figure 6.

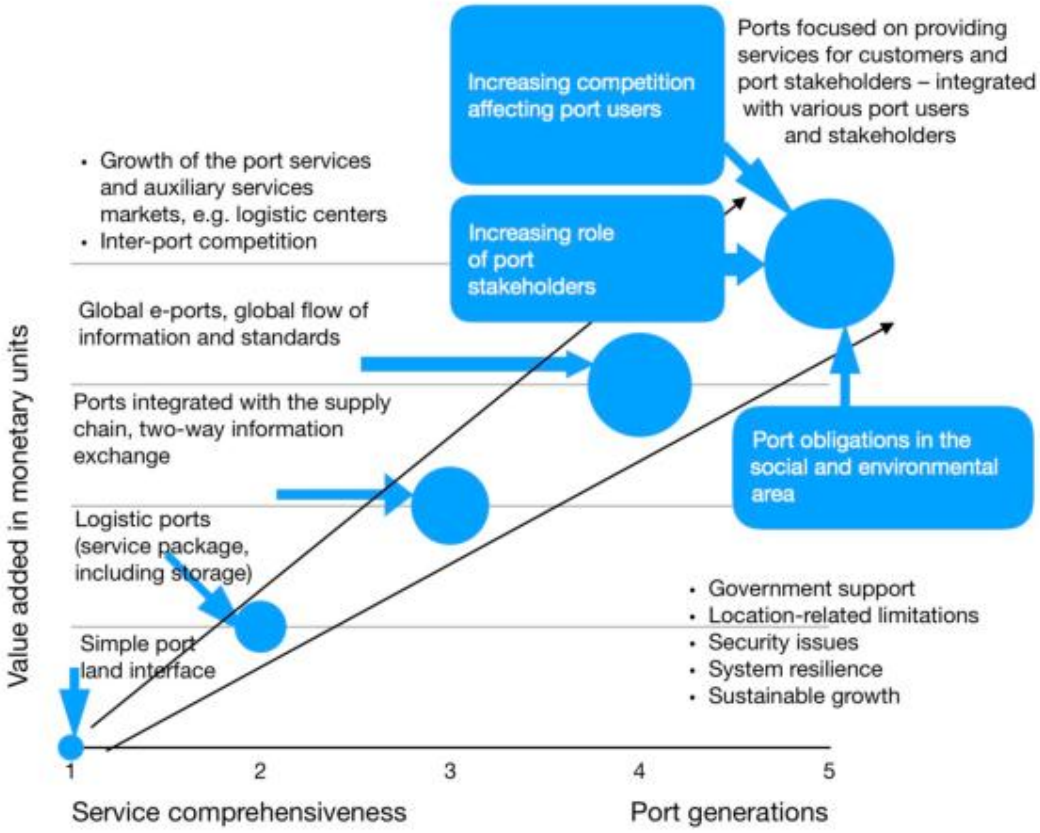

Figure 6: Evolution of port generations and their capacity for value added generation

(Source: Kaliszewski, Adam (2018), Fifth and Sixth Generation Ports (5GP, 6GP) – Evolution of Economic and Social Roles of Ports)

It can be concluded that the *ports in the Danube region fit into categories from the second to the fourth generations ports*. Nevertheless, it needs to be noted that by far the largest share of unitised cargoes in the Danube ports does not come from IWT but from rail and, to a certain extent, road transport. What is common for all these categories is the various level of industrial and logistic activities in or adjacent to port areas. The basic question to be answered here is how to attract more industrial and logistic activities to be either integrated in port activities or to be very closely correlated in order to benefit from synergies, concentration of vehicles and cargoes, intermodal options for cargo distribution, as well as from the concentration of production, transport and logistic activities.

Therefore, it is the common opinion of the study team that either creation of, or close and functional cooperation with hybrid logistic zones[19], is the one of the key factors for the overall industrial development of ports.

That being said, inland waterways ports in the Danube region should have the following ***roles***:

- Multimodal hubs with varying levels of intermodal facilities, serving at least as the basic interface between the various transport modes.
- Port-centric and sustainable hybrid logistic zones attracting port-related services, and, wherever possible, industrial facilities for the manufacturing, processing and logistic industries.
- Convenient regional business platforms for the trade and industry. Danube region ports have a vast but heavily underused potential to be the focal points of the regional economy.
- Specialised centres for handling of specific cargoes, including not just ship-to-shore transfer facilities and services, but also a full spectrum of logistic and industrial activities for specific cargoes.
- Facilitators of supply chains.

In order to make this possible, the following tasks, inter alia, should be accomplished:

- Define a regional supranational strategy for the Danube ports as integral part of the future EU Transport and Regional Policies in order to meet the challenges of ports such as digitalization, multimodality, security and climate change.
- Execute public investments in infrastructure of ports and terminals with a maximum use of funds of the EU in consideration and close cooperation with the private sector investment needs.
- Promote better distribution of available CEF budget among the transport modes, possibly securing a specific budget line for inland ports. In CEF I, only 52 IWT-related projects were funded with a total amount of 1.65 billion EUR in comparison to 16.36 billion EUR given to rail projects until March 2018.
- Apply National State Aid Schemes for ports and terminals investment as part of EU funding schemes in order to ease national budgetary constraints and to ensure high leverage of public spending through parallel private sector investments.
- Improve public port governance in order to ensure fair competition, higher responsiveness to market dynamics, to improve the service quality of port operators and to reduce red tape in public port administration.

[19] By "hybrid logistic zones" we refer to any logistic zones, free zones, free trade zones, special economic zones, free ports, logistic parks, freight villages, distriparks, etc. combined with industrial zones where various goods are manufactured or processed.

- Strengthen the "co-opetition" with the rail sector, which turned to be of extreme importance for intermodal transport in ports, especially in occupying capacities which would otherwise lay idle due to the lack of IWW-based intermodal traffic. In addition, the railways enlarge the geographical reach and scope for the inland ports. This includes also the access by railways to local plants and distributions centres in order to facilitate sustainable transport.
- Facilitate the planning and regulatory aspects so as to enable/simplify the establishing of hybrid logistic zones with logistic, processing and manufacturing contents in ports or in their immediate vicinity for the purposes of spatial concentration of activities and cargoes making possible the generation of critical masses of goods needed to trigger the substantial and stable demand for inland waterway and intermodal transport.
- Facilitate the integration of ports to supply chains.

It is very important to avoid comparing the Danube ports with the Rhine ports while trying to elaborate a proper development strategy for the port industry in the region. Differences between the trade and shipping situations in the Rhine and in the Danube basins are huge and are beyond the scope of this study. The very geography, accompanied varying levels of transport infrastructure of various modes, including the capacity of the hinterland access have a crucial role in development of inland ports. Different regional markets have their own potential requiring different transport services. Therefore, no Europe-wide one-size-fits-all strategy for inland ports development could be really useful since the differences in regional effects, geography and trade patterns remain fundamental. In more developed regions, such as Western Europe, the level of trade of containerized goods is very well developed and intensive. For this reason, a large number of inland waterway ports have been developed with a clear and logical focus on inbound/outbound logistics of containers (intermodal transport). For a number of reasons mentioned earlier, only a few of the Danube region ports are focused on container logistics. Even these ports handle containers flowing in and out of the port by, in the most cases, rail transport to/from North Sea and Adriatic ports, while currently no Danube port handles containers flowing in/out of ports using regular liner IWT services on the Danube. Consequently, at least as a first step in tackling the described situation with intermodal transport flows, the Danube port authorities should adapt their planning and land use in such way to secure enough space to attract and accommodate intermodal terminals which are primarily (and currently) rail-road intermodal (bi-modal) terminals, offering them the necessary space and a direct access to the waterway. However, in order to prevent the occupation of the berth line with the cargo which uses only rail and road transport, such terminals should be equipped for (and capable of) handling any compatible type of conventional cargo at the same berth line. Facilitating the intermodality in such way is expected to trigger the spatial concentration effects and thus attract containerized cargo into ports and thereafter, when/if the critical mass is reached, to trigger the demand for inland waterways transport of containers in those ports from/to which such transport is economically justified.

Conclusion: concentrate, specialize and go value added!

Globalization and the modern age have put a tremendous pressure on port authorities. In order to survive and thrive, port authorities should become less static and think "out of the box". This means that port authorities should widen their scope beyond that of the traditional facilitator with the centuries old focus on the provision of basic and operational infrastructure and, in some cases, facilities for transshipment and even storage. Modern waterborne logistics, transportation and port operations dictate that ports (port authorities and/or port operators) should have a new strategic role to play in land use planning, facilitation of the relocation of production, manufacturing and logistic facilities in or near port areas, supply chain integration, information systems and intermodality/multimodality. This role requires networking, not just between ports, but also between ports and other nodes, operators and market players. Although it may not be a universal panacea for ports, going beyond the limits of the port area in terms of physical interventions and organisational capabilities along supply chains stands good chances to gain competitive advantage for ports in the medium and long run.

New roles for Danube ports can be facilitated through the adoption of the development strategy and measures for its implementation developed in this study.

6 Methodology for identification of strategic objectives

Based on the SWOT analysis elaborated in previous sections, various strategies can be made. Depending on the input elements of the strategy (what do we want to do?), four basic strategies (types of strategic objectives) can be identified, as shown in Table 10.

Table 10: SWOT-based four types of strategies

Internal factors / External factors	Internal strengths	Internal weaknesses
External opportunities	SO STRATEGY (Maxi – Maxi)	WO STRATEGY (Mini – Maxi)
External threats	ST STRATEGY (Maxi – Mini)	WT STRATEGY (Mini – Mini)

(Source: iC consulenten)

Actionable strategies are formed combining information from two quadrants of the SWOT matrix in the following way:

- **Strengths–Opportunities (SO):** Use your internal strengths to take advantage of opportunities.
- **Strengths-Threats (ST):** Use your strengths to minimize threats.
- **Weaknesses-Opportunities (WO):** Improve weaknesses by taking advantage of opportunities.
- **Weaknesses-Threats (WT):** Work to eliminate weaknesses to avoid threats.

Current situation in the ports of the Danube region was diagnosed in detail within the D.6.1.1 Danube Ports SWOT Analysis. Once identified on both cumulative (country by country) and common (common aspects of the entire region's port industry) levels, all strengths, weaknesses, opportunities and threats of the port industry of the Danube region form the basic elements of the port development strategy. All objectives of such strategy need to be based on these elements.

Nevertheless, before setting the stage for the objectives of the Danube ports development strategy, a few guidelines for the nature of the objectives must be given. In order to be realistic and reachable, development objectives should be "S.M.A.R.T.". The acronym stands for:

- **S**pecific (simple, sensible, significant).
- **M**easurable (meaningful, motivating).
- **A**chievable (agreed, attainable).
- **R**elevant (reasonable, realistic and resourced, results-based).
- **T**ime bound (time-based, time limited, time/cost limited, timely, time-sensitive).

S - Specific
When setting an objective, we need to be specific about what we want to accomplish. This is like the mission statement for desired objective. This is not a detailed list of measures needed to be undertaken in order to reach an objective.

M – Measurable
What metrics will be used to determine if the objective is met? This makes an objective more tangible because it provides a way to measure progress. If it is a project that is going to take a few months/years to complete, then some milestones need to be set, by considering specific tasks needed to be accomplished along the way.

A – Achievable
This focuses on how important an objective is and what can be done to make it possible (reachable). This may require developing new skills and changing attitudes, even national or supranational legislation. The objective is meant to inspire motivation, not discouragement. It is necessary to think how the objective could be accomplished and if the right tools and skills are available. If such tools and skills are currently not available, options of attaining them should be investigated and weighed (worth or not).

R – Relevant
Relevance refers focusing on something that makes sense with the broader development goals. For example, if the objective is to launch a new project, service, terminal, technology, it should be something that is aligned with the overall development objectives.

T – Time-Bound
If an objective lacks realistic timing, probability of reaching it is low. Providing a target date(s) for "deliverables" is imperative. If the objective will take, say, three months/years to complete, it is useful to define what should be achieved half-way through the process or to establish milestones, as explained earlier. Providing time constraints also creates a sense of urgency and prevents taking implementation "for granted".

Table 11 below provides more details on how to work on four different types of strategies and formulate the port development objectives. All these strategies can be combined into one single strategy composed of all four or just one or of any convenient combination.

Table 11: Inputs for the setting of objectives within four types of strategies

	Opportunities (external, positive) O1: O2: O3: O4: … O*n*	**Threats** (external, negative) T1: T2: T3: T4: … T*n*
Strengths (internal, positive) S1: S2: S3: S4: … S*n*	**Strength-Opportunity strategies** Which of the port industry strengths can be used to maximize the opportunities that were identified? E.g. S1O1O3: S2O4: … SxOy:	**Strength-Threat strategies** How can the port industry's strengths be used to minimize the identified threats? E.g. S1T1: S2S3T4: … SxTy:
Weaknesses (internal, negative) W1: W2: W3: W4: … W*n*	**Weakness-Opportunity strategies** Which actions can be taken to minimize the port industry's weaknesses using the opportunities that were identified? E.g. W1O3O5: W2O1: … WxOy:	**Weakness-Threat strategies** How can the port industry's weaknesses be minimized in order to avoid the threats? E.g. W1T1T3: W2T1: … WxTy:

(Source: iC consulenten)

For the setting of the strategy objectives, any number of, say, strengths (S_1, S_2,…S_n) can be combined with any number of, say, opportunities (O_1, O_2,…O_n), so combinations like "S_2 S_5 S_7 O_2 O_4" or "S_1 S_3 O_1", or any other (strength-opportunity or strength-threat) can be made. The same principle is applied for weaknesses.

Putting it simply, the strategic development objectives define what we want to do, while the necessary development measures explain how we intend to achieve it.

7 National port industry strategic objectives and measures

7.1 Austria

7.1.1 Mission

Mission of the Austrian port industry can be formulated as follows:

"Austrian ports work as efficient trimodal logistic centres for the industrial site Austria with connections to the most important seaports".

Since Austrian ports are different legal entities with very different ownerships there are different mission statements of these companies as part of their own business papers. This leads to the fact that the 4 missions of Austrian public ports cannot be condensed to one common wording. Therefore, we use for the above mission statement the IGÖD-claim (IGÖD = Interessensgemeinschaft öffentlicher Donauhäfen Österreichs / which is a loose organization of the 4 public Austrian ports regarding combined activities).

7.1.2 Vision

The common vision of the Austrian port industry can be stated in the following way:

"To Become Business Excellence nodes in Austrian Logistics".

Austrian logistic in general is well developed and a very important part of the high level economy. Since the local industry is highly export oriented the need of well-organized logistic centres (ports and terminals) is a great demand; In the future some improvement work is necessary for ports to keep the high standard alive and reach out for further improvements in their own processes and management procedures. The orientation along the principles of EFQM model (EFQM: European Foundation of Quality Management) for business excellence is the standard the ports are looking for in the future. This means high performance in the two sectors "enablers" and "results" and consequent orientation on the needs of the five partners of organisations: clients, owners, employees, vendors and the society – but in a well-balanced system.

7.1.3 Objectives and measures

On the basis of the cumulative SWOT analysis (Annex I) of the port industry in Austria, as well as the methodology described in Chapter 7.1, Table 12 demonstrates various strategies (strategic objectives) of the Austrian port industry.

Table 12: Strategic development objectives for port industry in Austria

	Opportunities (external, positive) O1: decarbonisation O2: new markets O3: eco-footprint philosophy O4: new city logistics O5: alternative fuels O6: real estate industry O7: e-commerce O8: physical internet O9: rail cargo attractiveness O10: agricultural focus O11: regionalization of supply chains O12: one belt – one road O13: containerization of cargo O14: short distance alternatives O15: modal split shift O16: infrastructure flexibility O17: new industrial clusters	**Threats** (external, negative) T1: problems with Danube navigability T2: stricter environmental regulations for ports T3: road and rail competition T4: containerization of cargo T5: vessel owner community T6: bureaucracy T7: emigration of industry T8: relation with the neighbourhood T9: outdated laws T10: decentralized production T11: public economy T12: lack of skilled workforce T13: international/ global economy T14: overcapacity T15: rail bottlenecks
Strengths (internal, positive) S1: economic Situation S2: good Location S3: heart of Europe (TEN-T network) S4: bridgehead functionS5: logistic competence S6: hinterland hubs S7: modern standards S8: trimodality / intermodality S9: local traffic connections S10: transnational connections S11: qualified personnel S12: containerized business S13: experience in demand driven development S14: Austrian Danube Navigability S15: via donau as successful waterway administration	**Strength-Opportunity strategies** *Which of the port industry strengths can be used to maximize the opportunities that were identified?* S3O12: connecting of Danube (+ports) with BRI S12O15: development of empty container management on the Danube	**Strength-Threat strategies** *How can the port industry's strengths be used to minimize the identified threats?* S14T1: international lobbying for navigability of the Danube with best practice example of Austria S7T2: environmental management systems in the ports as part of new standards
Weaknesses (internal, negative) W1: low capacity utilization W2: capital intensity W3: business models W4: lack of expansion space W5: public economic situation	**Weakness-Opportunity strategies** *Which actions can be taken to minimize the port industry's weaknesses using the opportunities that were identified?*	**Weakness-Threat strategies** *How can the port industry's weaknesses be minimized in order to avoid the threats?*

W6: railway infrastructure W7: railway bottlenecks in Austria W8: low investment capacity of vessel owners W9: small market sector W10: insufficient lobbying for ports and IWT W11: dislocation of heavy industry W12: small strategic dimension W13: slow business development	W1O1: increase transhipment figures by new products regarding decarbonizing strategy W6O12: improvement of railway connections for future connections of the ports with BRI	W6T3: development of future synergies through improvements in rail cargo business W4T4: new cooperation with the surroundings in order to make better utilization of port infrastructure without new areas

(Source: EHÖO)

Below table summarizes the strategies (strategic objectives) and their corresponding development measures necessary to reach the objectives and implement the agreed strategy.

Table 13: Strategic objectives and necessary development measures for Austrian ports

Country	Strategic objectives	Necessary development measures
AT	Connecting of Danube (+ports) with BRI	• elaborate concept with Austrian ministry
	Development of empty container management on the Danube	• check grant possibilities with ministry • contact to shipping companies to develop models • implement pilot operations
	International lobbying for navigability of the Danube with best practice example of Austria	• enhance activities of promotion and lobbying • broad enhancement (via EU/EFIP/TEN-T working group) to copy Austrian systems or bring similar measures in Danube countries • more involvement of owners of Austrian ports to create broad approach for international lobbying
	Environmental management systems in the ports as part of new standards	• start/enforce initiatives of the ports • development of a new brand via DPN • reach certificates through projects
	Increase transshipment figures by new products regarding decarbonisation strategy	• investigate new options or develop new grants with national and local ministries and agencies
	Improvement of railway connections for future connections of the ports with BRI	• standalone projects of the ports
	Development of future synergies through improvements in rail cargo business	• start combined meetings of IGÖD/PDA with rail industry • develop combined products
	New cooperation with the surroundings to make better utilization of the port infrastructure without new areas	• development of marketing inventory and programs for specific company settlement (tailor-made for port usage) • realize the concept guidelines for industrial development in ports

(Source: EHÖO)

Objective 1: Connecting of Danube and its ports with the "Belt & Road Initiative"

Asian economic development is quite successful and is promising future increasing activities. The Belt and Road Initiative (BRI, formerly known as "One Belt – One Road initiative" - OBOR) coming from China is not only concentrating on logistic points but is aiming in the development of new business corridors with company settlements in a new level. Therefore, it is necessary to have a good look to this initiative and try to connect the existing business regions along the Danube region in best ways to these new developments. Otherwise, there can come a big threat to existing regions and todays booming zones when not being connected to new developments in the future. The existing ports and multimodal cargo centres have to look carefully for new connections to these developing lines and corridors to survive in high level business activities.

Implementation measures

Elaborate concept with Austrian ministry
The national strategy of Austrian government has still covered this item of new developments in the Eurasian continent, especially for rail connectivity (broad gauge). Even the good connection to waterways has to be considered to connect the existing terminals to the new lines. Therefore, the Austrian ports started discussions with relevant partners in transport ministry which will be an ongoing business for the next future. Since there are no fixed timelines or concrete milestones of the BRI in the relevant Danube region no further deployment of milestones or other activities is possible now. The midterm target should be a good connection of Austrian ports (and so for this Danube section in general) to the developing zones in the next years (iterative ongoing process).

Proposed responsible organisation(s):	Ministry of infrastructure and 4 Austrian ports
Proposed duration:	72 months
Proposed time frame:	1-72

Objective 2: Development of empty container management on the Danube
There are no permanent regular container freight lines on the waterway Danube like on the river Rhine. Some ports have got spot business of empty container on demand. The aim of this objective is to establish a structured logistic of empty containers in the next years in order to support and complete the railway lines and handle increasing cargo transport in the Danube region and comply with decarbonizing targets in total in the next decade (combined solution of truck, railway and waterway). A first interesting zone in the Danube region was identified within the container study of DAPhNE between the sections of Regensburg down to Budapest where a lot of container cargo is handled today and promising approaches in switching empty containers more and more to waterway solutions really exist.

Implementation measures

Check grant possibilities with ministry

The mentioned container study showed that there is a special founding system in Austria for empty containers on rail in order to bring them away from street. There is no corresponding program for waterway so there is a disadvantage in the market for the ports now. Therefore, Austrian ports will try to find an approach with relevant people in ministry. Start of negotiations will be in the first half of 2019, further milestones cannot be fixed now as these next steps depend on the results of the first meetings.

Proposed responsible organisation(s):	ministry of infrastructure und Austrian ports
Proposed duration:	24 months
Proposed time frame:	1-249

Contact to shipping companies to develop models

As empty container business is a common interesting topic for all container terminals the first step is try to find a combined approach in the Austrian port agency IGÖD to organize some kind of "structured contacting of the relevant players". In these contacts with shipping companies the situation should be analysed with the aim to develop further steps to improve empty container business on water according to the findings of the Daphne container study.
In the first half of 2019 a clarification within IGÖD should be reached either to do it together or not. In case of a positive common approach all other steps have to be defined in the following months after decision (probably in 2019). In case a singular approach will come out from the decision (due to competition reasons within the terminals) then every port will make his own contacts with his business partners and will further develop his own strategy and timeline.

Proposed responsible organisation(s):	Austrian ports
Proposed duration:	48 months
Proposed time frame:	1-48

Implement pilot operations

After the decision of the above items and positive feasibility & further preparation in best case a pilot operation shall be planned and implemented according to the findings of the DAPhNE container study. This means that some tests should be started within the most prospective area as identified in the study – the region between Regensburg and Budapest should be evaluated because of the still existing huge container business in these business zones and well equipped ports for processing empty containers. No further milestones can be fixed today for this steps.

Proposed responsible organisation(s):	Austrian ports
Proposed duration:	36 months
Proposed time frame:	13-48

Objective 3: International lobbying for navigability of the Danube with best practice example of Austria

In the last decade Austria took a very active role within the Danube region strategy regarding improvement of navigability of the Danube and permanent maintenance. Based on these positive experience the activities should be strengthened and a roll out of the same performance should be reached in the final in all riparian countries.

Implementation measures

Enhance activities of promotion and lobbying

The activities of the Austrian players via donau, PDI, PDA (Pro Danube Austria, Pro Danube International) should be prolonged and multiplied to other countries. Therefore, the existing activities and program lines within the Danube region strategy should be carefully processed in the future and realized. IGÖD will continue in supporting of these activities and improve lobbing activities (permanent process - no further milestones fixed at the moment).

Proposed responsible organisation(s):	DPN
Proposed duration:	96 months
Proposed time frame:	1-96

International "broad enhancement" (via EU/EFIP/TEN-T working group) to copy Austrian systems or bring similar measures in all countries along the Danube

The improvement of fairway conditions along the whole Danube is one of the most urgent things in order to improve IWW and waterside transhipment of port business in the whole Danube region in the future. Therefore, in the outcomes of the DAPhNE project a work plan for the Danube Ports Network (DPN) is one of the core elements and promising instruments for the future. In this work plan the item of "improvement of fairway conditions" is one of the most important tasks. Ports would have no good future if the connecting lines between them will show bad performance. This items becomes more serious in reflection to the problems deriving from climate change.

Proposed responsible organisation(s):	DPN
Proposed duration:	96 months
Proposed time frame:	1-96

More involvement of owners of Austrian ports to create broad approach for international lobbying for navigability

One additional supporting activity regrading international lobbying for navigability of the DANUBE should come from the owners of the Austrian ports. So the elaborated core elements of DAPhNE (core outcome) should be presented from the port managers to their different

owners in order to make them aware of this critical topic for good development of the ports in the future.

Proposed responsible organisation(s):	Austrian Ports
Proposed duration:	96 months
Proposed time frame:	1-96

Objective 4: Environmental management systems in the ports as part of new standards
Decarbonizing targets are a core element of today´s EU-strategy and the national governments. Since water transport and port business have got very sound environmental figures there could be a considerable part for decarbonising traffic in the future by shift cargo to the waterway and improve the transport figures in this direction. This means a lot of marketing work of the ports and other stakeholders to convince market players for this new approach. The own environmental management systems of the ports shall support these processes in the future.

Implementation measures

Start/enforce initiatives of the ports
In the different strategies and business plans of the Austrian ports there are several initiatives and targets with regard to decarbonising strategies and environmental performance improvements. These activities will be pushed to different ports by themselves and followed milestones and steps will be fulfilled.

Proposed responsible organisation(s):	Austrian Ports
Proposed duration:	96 months
Proposed time frame:	1-96

Development of a new brand via Danube Port Network
DPN was realized in the framework of DAPhNE project. One of the targets of DPN for the next years is to create some kind of “new brand” for Danube ports of the new establish network. This new brand shall bring better visibility and identification of the members as environmental friendly centres of regional economic development – both on the national as on the international level. DPN will guide this measure and the regional ports of the Danube riparian countries will try to comply with this new approach.

Proposed responsible organisation(s):	DPN
Proposed duration:	36 months
Proposed time frame:	1-36

Reach certificates through projects
Austrian ports have discussed within IGÖD their different situations regarding environmental certificates. A basic approach was that each port will develop his own way but in general everybody has realized to improve the situation and reach a certificate within the next years or still has got a certificate and will look for prolongation of this. So the relevant milestones and concrete steps are on the level of each port. IGÖD will have a combined look on the general situation as well.

Proposed responsible organisation(s):	Austrian Ports
Proposed duration:	36 months
Proposed time frame:	1-36

Objective 5: Increase transshipment figures by new products regarding decarbonisation strategy
Europe and the national states of Europe (e.g Austria) have defined strategic targets for decarbonizing in the deployment works of COP (Paris-targets, etc.). This means that special targets have to be defined for the great emission sources. Transport in general is one of the great emission source of CO2 and new approaches should be developed in order to reach the reduction limits and targets. This can mean a good chance for increasing water transport for certain goods as water transport offers very sustainable and low level ecological footprint in general. In order to meet customer demands some new combined processes should be developed to meet a carbon-targeted transport situation. This must lead to modal shift in the next decade to low emission modes – e.g. water transport. Perhaps even new "transport products" have to be developed in order to fulfil customer demands for time, quality, etc. Therefore, new "transport process products" have to be developed with both water and other modes (truck, train) in order to fulfil new CO2-targets.

<u>Implementation measures</u>

Investigate new options or develop new grants with national and local ministries and agencies
Many cargo owners (shippers, receivers, etc.) would like to switch to most friendly environmental transport mode but are forced by low cost of competitive routes (via trucks) to use other modes. Each new development has better position by serving pushing & pulling elements especially in the first years of implementing.
Therefore, a forcing of new deals by grants or other official products (e.g. tax instruments) shall be discussed in order to bring customers to switch to water transport. These initiatives will be discussed via IGÖD with the relevant Austrian ministry in 2019. All other steps and milestones cannot be fixed now as there are a lot of other circumstances outside the ports /e.g. national climate strategy and its action plans – still in elaboration in Austria).

Proposed responsible organisation(s):	Ministry of transport and Austrian ports
Proposed duration:	96 months
Proposed time frame:	1-96

Objective 6: Improvement of railway connections for future connections of the ports with "Belt-Road-Initiative"

In the future ports in general have to focus more on rail cargo and the relevant transhipment due to actual developments of the corresponding markets and actual climate influences. Even when looking for best fairway conditions on the Danube there will be a very great bottleneck remaining for the future decades – the section of Straubing-Vilshofen in Germany which cannot be calculated for water transport for a lot of weeks of a year. On the other hand, there is a permanently improving pressure from the developing strategy "Belt and Road Initiative" focussing the land-land transport way and accompanying business development corridor between Asia and Europe. These corridors of BRI are not only targeted on the core Danube region and waterway. Therefore, it is worth do investigate and develop strategies in order to secure direct connections to this developing corridors for the future. These connections can only be realized by rails as cargo traffic shift to roads will absolutely counteract the goals of decarbonizing logistics in Europe. So it is necessary to follow this strategy to improve rail connections from the existing ports / logistic areas / business zones to the upcoming initiatives otherwise there might come up a real huge threat for the "old centres" to loose cargo to new growing centres or transhipment in the future which are not allocated on the Danube as the new corridors may be situated on the land-optimized points.

Implementation measures

Standalone projects of the ports

Each port (together with the existing terminals in the Austrian ports) has to look for his own site connection of railway lines on the national level. As these activities are so different and need tailor-made approaches there could not be described a general implementation process for whole Austria. Performance indicators are singularly project realization of the ports (e.g. the actual CEF-project of Linz).

Proposed responsible organisation(s):	Austrian ports
Proposed duration:	96 months
Proposed time frame:	1-96

Objective 7: Development of future synergies through improvements in rail cargo business

The last two decades have shown that Austrian ports have done a diversification strategy into a great railway business due to erection of container terminals. The original focus of these logistic points on cargo transhipment from water to land has changed to both water and railway (and the last miles via trucks). This is a dynamic ongoing development.

In the future, ports have to focus more on rail cargo and the relevant transhipment due to actual developments of the corresponding markets and actual climate influences. Even when looking for best fairway conditions on the Danube there will be a very great bottleneck remaining for the future decades – the section of Straubing-Vilshofen in Germany which cannot be calculated for water transport. On the other hand, there is a permanently improving pressure from the developing strategy "Belt and Road Initiative" focussing the land-land transport way and accompanying business development corridor between Asia and Europe. So it would be a good approach to go proactive into this challenge and try to get the best of this option otherwise this can run into a great threat for ports only sticking on the water business. The focus should be on "getting into more cooperation with rail business and not to stick on the bad competitor picture". This sector is too big as to win a hard competition in the end. So it is quite better to start cooperation and perhaps find together better solutions for the decarbonizing challenges of the next decades.

Implementation measures

Start combined meetings of IGÖD/PDA with rail industry
IGÖD started in Q4/2018 within the regularly quarterly meeting and invited the corresponding national rail partner organization. This can be the beginning of a permanent process of deeper cooperation meetings. At the moment no further milestones can be fixed since this approach has to be developed very carefully.

Proposed responsible organisation(s):	Austrian ports
Proposed duration:	24 months
Proposed time frame:	13-36

Develop combined products
A midterm target could be the establishment of "combined products (perhaps CO2-footprinted products" for the market for the next decades. This idea is on a very low precision level at now and has to be developed in accordance with upcoming targets of the national deployment plans for fulfilling CPO-targets.

Proposed responsible organisation(s):	Austrian ports, Ministry of infrastructure
Proposed duration:	60
Proposed time frame:	25-84

Objective 8: New cooperation with the surroundings to make better utilization of the port infrastructure without new areas
Ports shall go on with opening their activities towards to surroundings (as they have still done it in the past in Austria) and think with all relevant partners about how to make more usage of existing infrastructure in the future and permanent changings around. This is a core interest of each port or port company because it is the basis for business and incomes from market. Market situation (local, regional and global) is in a permanent developing and changing

process and permanently brings up options and threats for every partner in the dynamic market, so for the ports too. Therefore, it is necessary to set up a permanent continuous improvement process for everybody in order to survive in these dynamic circumstances. Especially in Austria port infrastructures have been erected in the past and a lot of capacities came out of these development decades, infrastructure which has still free capacity in some dimensions which should be more used from wide market processes. As Austria is a well-developed country free space ("greenfield") will get rarer and rarer for the future. Therefore, a good focus should lay on how to become more efficient and bring more output of the existing areas and infrastructures because there is simply no additional space to grow.

Implementation measures

Development of marketing inventory and programs for specific company settlement (tailor-made for port usage)

Each port in Austria makes an evaluation and update of his own marketing inventory (internal and external) regarding company settlement in the (nearer) port areas and its surroundings. Due to existing competition of the ports regarding company settlement this is a two-level process: level 1 is public and is interchanged in relevant boards, meetings and combined actions of IGÖD. Level 2 is internal for each port company due to confidential and completion reasons. Level 1 will be done in a twice-year interval according to the combined 1-week-event in the "Munich Transport logistic" fair; preparation for this event is done together and updated instruments (brochures, films, homepage inventory) are checked by everybody to be up to date in those intervals. The cooperation in IGÖD triggers a combined "picture" of Austrian ports to the open market. Level 2 activities are done by every port company on his own strategy. So this measure is not a singular activity but a permanent process – even done in the past but now more focussed for the future.

Proposed responsible organisation(s):	Austrian Ports
Proposed duration:	96
Proposed time frame:	1-96

Realize the concept guidelines for industrial development in ports

The "guidelines for industrial development initiatives in ports" elaborated within the DAPhNE project (deliverable D.5.1.3) are recommended as follows:

- Consider privatisation of excess port land – where possible – while reserving enough land slots for own port development
- Enforce various PPP models for Hybrid Logistic Zone (HLZ) establishment and development
- Create functional modalities for cooperation of all involved and interested stakeholders, e.g. a port or HLZ development board or commission
- Adaption of legislation in such way to enable the port authorities to establish hybrid logistic zones, alone or in cooperation or joint ventures with other public and/or

private entities (in certain cases only municipalities or other governmental tiers can establish logistic, industrial or free zones)

- In order to prevent various abuses with the land, the land should be owned by the public sector (state, municipality, …) or, if privatized, the land should be dedicated for logistic and/or free zone purposes only
- Improve the integration between modes in ports in order to achieve not just multimodality, but real intermodality in ports
- Develop attractive conditions for the settlement of industries in or adjacent to port areas

The above guidelines will be presented and discussed in the frame of an output dissemination process of DAPhNE for Austrian ports / stakeholders especially in two steps:

1) regularly IGÖD-meetings (4 times a year): planned for the scheduled 2019-meeting (as was done in 2018 with focus on PCS-pilot action)
2) meeting with Austrian ministry (port department).

Each port company will take the input and will decide on himself either to reflect on these items in accordance with his own business strategy and ownership or other circumstances. Because this is part of (mostly confidential) business strategies of the different ports a regular process and description of time frame, resources, milestones, … cannot be fixed here. All combined Austrian measures (which are considered by all ports as combined and necessary action) will have a follow up treatment in the frame of IGÖD / 4 regular meetings each year and will be followed within the period of the next years.

Proposed responsible organisation(s):	Austrian Ports
Proposed duration:	96 months
Proposed time frame:	1-96

7.2 Slovak Republic

7.2.1 Mission

"To increase the efficiency of transport infrastructure in the area of public ports in the interests of the development of water transport in the European context"

River ports and related transport of goods and passenger have been integral part of cities of Bratislava and Komárno for centuries, as old sources, pictures and photos show. However, in the last few decades, waterway transport has been associated with underfunding, economic stagnation and even with idea of reallocation of port or even termination of activities. The role of public ports in the territory of the Slovak republic is to act as modern hubs for sustainable and eco-friendly transportation of cargo and passengers, to play the role of considerable alternative for rail and road transportation and to be relevant partner in terms of national and international development projects in cooperation with private and public sector.

7.2.2 Vision

"To create conditions for the development of combined transport, including the handling of combined transshipment units."

Area of public ports in Slovakia have the potential to become modern logistic and industrial zones as multiple studies and researches have shown. It is up to port authority in cooperation with relevant private and public stakeholders to embrace this potential in the national and European (CNC) context. Development strategy of public ports of Bratislava and Komárno will be defined in Master plans, that are currently being prepared. Mentioned Master plans will be followed by Feasibility studies, where particular measures and actions will be defined. Cost Benefit Analyses, SEA and EIA will be included as well. Current status of legislation and funding opportunities available for financing port development activities were summarized in previous stages of DAPhNE Project. The most important milestone ahead is the future definition of ownership relations in the area of public ports in Slovakia and eventual implementation of full Landlord Model.

7.2.3 Objectives and measures

On the basis of the cumulative SWOT analysis (Annex I) of the port industry in the Slovak Republic, as well as the methodology described in Chapter 7.1, Table 14 demonstrates various strategies (strategic objectives) of the Slovak port industry.

Table 14: Strategic development objectives for port industry in Slovakia

	Opportunities *(external, positive)* O1: Growing trend in logistics and international goods transport O2: Increase production of cars and consumer goods in Slovakia O3: Orientation of the economy of the SR mainly on export O4: Potential for improvement of port services O5: Allocating of funds for the development of the Bratislava port within Operational Program 2014-2020(hereinafter "OP II") O6: Eventual extension of port services provided O7: Expiration of long-term lease contracts with port operator(s) O8: Finding new funding sources for port development	**Threats** *(external, negative)* T1: Direct competition of rail and road transport T2: Dependence of the use of water transport on weather and hydrological conditions T3: Main port (Bratislava) is close to historical town center, which limits an industrial development
Strengths (internal, positive) S1: Strategic geographic location in relation to the location of potential customers' connection to a network of inland waterways of international importance S2: Competitive shipping costs S3: Supporting the development of water transport by the European Union S4: Possibility of absorption of EU funds for development S5: All public ports are owned by one subject (VP a.s.)	**Strength-Opportunity strategies** *Which of the port industry strengths can be used to maximize the opportunities that were identified?* S1O1: Long-term strategy of general development of ports S3O4: Improvement of existing port services S2O3: Attracting new companies and customers into ports S2O4: Improvement of communication with public authorities on planned activities S2O5: Public Private Partnership projects with private sector S4O5: Proactive initiation of internal projects	**Strength-Threat strategies** *How can the port industry's strengths be used to minimize the identified threats?* S2T1: Increase of competitiveness of public ports
Weaknesses (internal, negative) W1: Long transport times in water transport low transport capacities of an existing fleet W2: Weak awareness of the possibilities of use of water transport by logistics operators in Slovakia need for multiple transshipment	**Weakness-Opportunity strategies** *Which actions can be taken to minimize the port industry's weaknesses using the opportunities that were identified?* W5O7: Trade negotiations with port operators	**Weakness-Threat strategies** *How can the port industry's weaknesses be minimized in order to avoid the threats?* W2T1: Improvement of multimodality to promote combined transportation

W3: Limited use of EU funds due to Non-standard property relations in public ports W4: Current technical state of port infrastructure and superstructure W5: Port transshipping capacity insufficiently used W7: Assets managed by VP, a.s. under the Act No. 338/2000 Coll. described as "Priority Investment Assets" W8: Long-term lease contracts with port operator	W7O6: Extension of services provided by VP a.s.	W3T1: Increase of reactiveness related to public funding opportunities

(Source: VPAS)

Below table summarizes the strategies (strategic objectives) and their corresponding development measures necessary to reach the objectives and implement the agreed strategy.

Table 15: Strategic objectives and necessary development measures for Slovak ports

Country	Strategic objectives	Necessary development measures
SK	Strategy of general development of ports	• Elaboration of the Master Plan and Feasibility Studies for ports in Bratislava and Komárno
	Improvement of existing port services	• Waste management • Eco-friendly solutions (alternative fuel)
	Attracting new companies and customers into ports	• Lease of currently not used property (land, storage capacities)
	Improvement of communication with public authorities on planned activities.	• Regular coordination meeting with relevant public stakeholders / authorities
	Proactive initiation of internal projects	• Trainings and education of internal staff
	Increase of competitiveness & Improvement of multimodality to promote combined transportation	• Increasing the transshipment capacities using the previously unused area owned by Public ports, jsc
	Trade negotiations with port operators	• Setup of current non-standard division of ownership relations • Renegotiation after expiration of existing contracts • Determination of minimum transhipment performance of port operator(s)

Country	Strategic objectives	Necessary development measures
	Increase of reactiveness related to public funding opportunities	• Continuous monitoring of information sources of public support in order to provide a prompt reaction by the company in case of suitable calls

(Source: VPAS)

Mapping of Stakeholders

Potential stakeholders involved:

- Verejné prístavy, a.s. / Public ports, jsc
- Ministry of Transport and Construction of the Slovak Republic
- Ministry of Environment of the Slovak Republic
- The Railways of the Slovak Republic
- Slovenská plavba a prístavy, jsc
- Dalby, jsc
- Port services, jsc
- Slovenský plynárenský priemysel, a.s.
- Transport Authority
- Slovak Water Management Enterprise
- Municipalities of Bratislava and Komárno

Verejné prístavy a.s. / Public ports, jsc

Public Ports, jsc was established on 21 January 2008 under the Act No. 500/2007 Coll., Amending Act No. 338/2000 Coll. on inland navigation. The founder of the company is the Slovak Republic, in which the Ministry of Transport and Construction of the Slovak Republic acts. Public Ports, jsc is responsible for:

- ensuring the preparation and realization of the construction of public ports in the Slovak Republic, together with the elaboration of long-term and short-term concepts of their development,
- ensuring the operation, maintenance and repairs, as well as the registration of facilities and facilities in the territorial districts of public ports,
- renting land in the territorial districts of public ports and other activities directly related to the loading of property in the territorial districts of public ports,
- collecting payments for the use of public ports,
- creating the conditions for the development.

Ministry of Transport and Construction of the Slovak Republic

The Ministry within the scope of the defined relevant area of competence

- defines the concept of the development of inland navigation of ports and waterways and in cooperation with the Ministry of the Environment of the Slovak Republic ensures its implementation in accordance with the intentions of the state transport policy,

- provides the development of inland waterway transport, determines its needs and represents its interests in the construction and modification of waterways and ports,
- helps to involve waterborne transport in intermodal transport,
- represents the Slovak Republic in matters of inland navigation in contact with international organizations operating in the field of inland navigation,
- supports international cooperation on the transport of dangerous goods by inland waterways,
- monitors the development of the capacity offer of vessels engaged in the transport of goods in water transport recorded in the register of vessels, evaluates the intensity of waterborne transport in relation to vessel capacity, waterway navigability and their condition, and monitors whether the development of vessel capacity and water transport intensity do not lead to serious disturbance the financial capacity of carriers,
- imposes sanctions
- submits to the European Commission a request for recognition of the classification company and shall send all the information and documents necessary to meet the recognition criteria,
- agrees to establish ports and defines their territory,
- determines the territory of the public ports after negotiating with the competent local self-government authority,
- grant and withdraw the authorization to carry out the technical inspection of the vessel,
- grants and revokes a certificate of belonging to the Rhine,
- grants and revokes permission for the participation of foreign carriers in national waterways,
- grants and revokes a license for the operation of public water transport
- issue a certificate of professional competence of the carrier,
- Issues a binding position in proceedings in which the relevant building authority is involved in the establishment and operation of temporary buildings serving public port users on a priority
- investment property or construction that enters a waterway or is part of a waterway,
- expresses its views on the planning of land-use planning documentation for the interests of inland navigation,
- grants and revokes the mandate to carry out the training of applicants for the issue of a certificate of professional competence of the Safety Advisor and for the training of applicants for the issue of a certificate of special knowledge in the field of the transport of dangerous goods by inland waterways,
- approves the charging rate for the use of public ports
- refers to lease agreements for priority investment property in public ports where the Ministry's approval is required,
- issues a permit for third-country transport,
- expresses its views on the registration of priority capital assets,
- provides the transporter with a subsidy.

Ministry of Environment of the Slovak Republic
The Ministry of the Environment was re - established as of 2 November 2010 to function as the central state administrative authority and supreme inspection authority in environmental affairs. To guarantee an inspection activity of the Government of the Slovak Republic, the Ministry of the Environment co-ordinates the activities of all Ministries and other central state administrative authorities of the Slovak Republic in environmental matters.

- nature and landscape protection
- waste management
- protection of water resources and the quality of groundwater and surface water
- fisheries and forestry in national parks
- environmental impact assessment of activities and their consequences
- air protection,
- geological works,
- genetically modified organism.
- national environmental policy
- unified information system on environment and area monitoring

Slovenská plavba a prístavy, jsc
Slovenská plavba a prístavy a.s. (SPaP a.s.) has been a dominant company in the field of transport, transhipment and warehousing of goods, forwarding services, repair works and building of new vessels on the territory of the Slovak Republic. The company offers logistics services, being connected with transportation of all kinds of goods on the river Danube as well as on the whole network of West European waterways between the North Sea and the Black Sea. The company SPaP a.s. with its technical equipment, high-quality services and skilled workers, has an interesting geographic and logistic location in the field of warehousing, transhipment and transport of cargoes.

The SPaP a.s. is directly involved in:
1. Railway transport
2. Road transport (highway junction)
3. Internal pipeline from the SLOVNAFT-refinery

Dalby, jsc
Specialized transhipment operations with operation at a newly-built transhipment equipment at the Port of Bratislava in the area of the Pálenisko basin with technology unique in the territory of the Slovak Republic, guaranteeing the minimization of the risk of leakage of petroleum substances and maximizing operational safety.

Transhipment of mineral oils (diesel and gasoline) under the export regime - filling of tankers of inland waterway transport on two platforms designed for the translation of diesel fuel and one platform for the transhipment of petrol.
The operation is ensured by modern transverse arm technology with a tear-off closure when the craft is thrown away from the platform, shuttle technology, decommissioning in crash situations of various types, as well as an automatic bubble curtain and trapping wall protecting the Danube and the Little Danube from oil spills.

Port services, jsc
Independent, private handling company was founded in 1992 by Fin-Mark und Mierka Donauhafen Krems. Port Service Bratislava develops reliable handling and logistics services especially for agricultural products and fertilizers from the extremely well positioned Slovakian port of Bratislava.

The Railways of the Slovak Republic
Železnice Slovenskej republiky in abbreviated form "ŽSR" were created on 1 January 1993 by a decision of the Government of the SR on the establishment of a state enterprise following the division of the Czechoslovak Socialist Republic and thus to the division of Czechoslovak State Railways into two separate entities. The decision of the Government of the Slovak Republic was elaborated by the Act of the National Council of the Slovak Republic no. 258/1993 Coll. on Railways of the Slovak Republic of September 30, 1993, as amended. Since January 1, 2002, the ŽSR has been divided into two separate entities - ŽSR and Železničná spoločnosť SK (ŽSSK), according to the Transformation and Restructuring Project of the ŽSR with ŽSSK. Subsequently, on January 1, 2005, ZSSK was divided into the Railway Company Slovakia, a.s. providing passenger transport and Cargo Slovakia, a.s. ensuring freight.

The ŽSR provides transportation and transport services that correspond to the interests of the state transport policy and market requirements, including related activities.

Slovenský plynárenský priemysel, a.s.
Slovenský plynárenský priemysel, a.s. (SPP) is the largest energy supplier in Slovakia, which, in the area of gas supply, directly follows the more than 160-year tradition of the Slovak gas industry and has been successfully operating on the electricity supply market since 2012. Overall, more than 1.3 million customers use reliable energy supplies and other energy services from the SPP. Through its subsidiary SPP CNG, s.r.o., which currently operates 9 public filling stations in Slovakia, supports the development of compressed natural gas (CNG) transport as an ecological alternative to traditional fuels. Social responsibility activities are implemented through EkoFond, n.f. and the SPP Foundation. Since 2014, it owns 100% of the shares in the Slovak Republic, which exercises its shareholder rights through the Ministry of Economy of the Slovak Republic.

Transport Authority
Transport Authority was established by the Act No. 402/2013 Coll. on Regulatory Authority for Electronic Communications and Postal Services and on Transport Authority and on amendments of several acts, coming into force on 1 January 2014 as a state administrative body with nationwide operation in the area of railways and other guided transport, civil aviation and inland waterway transport. Transport Authority is a legal successor of the Railway Regulatory Authority, Civil Aviation Authority of the Slovak Republic and State Navigation Administration. Inland Waterway Division undertakes the tasks and activities in the area of inland waterway navigation in accordance with Act No. 338/2000 Coll. on Inland Navigation and on Amendments to Some Acts as amended by later regulations.

Slovak Water Management Enterprise
Slovak Water Management Enterprise, state enterprise (shortened SVP) is an authority managing watercourses and river basins in Slovakia. It belongs among strategically important state-owned enterprises with a modified management method, as it also has assets which, according to the Constitution of the Slovak Republic (Article 4), are exclusively state-owned. Provides care for water courses and tangible fixed assets built on them, cares for the quantity and quality of surface and groundwater. Part of the activities of the Slovak Water Management Company has the character of performance in the public interest - it is primarily flood protection and the creation of navigation conditions.

Objective 1: Strategy of general development of ports
Despite the rich heritage of port industry in Slovakia, there is currently no clear and defined strategy for development of inland ports in the country. This acts a major constraint for planning and financing ideas and projects and consequently causes underfunding and economical and technical stagnation of inland ports.

Further development of inland ports must be based on key strategical documents elaborated with enough level of expertise reflecting particularities and specifics of covered areas. Documents must be available and accessible for relevant stakeholders, whether public or private. Elaboration of documents Master Plan Bratislava and Master Plan Komárno is a key for eligibility of other development projects. The main goal is to establish a framework for future development of public ports Bratislava and Komárno (cargo and passenger ports), to develop a business plan, marketing strategy and to define the future functionality of the port in the context of the international/national and regional/logistic chain.

According to Act No. 500/2007 Coll., Amending Act No. 338/2000 Coll. on Inland navigation, Public ports, jsc were set up to ensure the preparation and implementation of the construction of public ports, including the processing of short and long-term concepts of their development, as well as the provision of operation, registration, maintenance and repairs of facilities in the area of public ports. Currently the infrastructure at public ports needs to reflect the requirements for port services and infrastructure. Feasibility studies described in Objective 1 will develop the scope and objectives of necessary modernization.

<u>Implementation measures</u>

Elaboration o Master Plan and Feasibility Studies for port of Bratislava
The main goal of document Master Plan II (Bratislava) is establishment of development framework for public port Bratislava, which will reflect all legislative and market needs in connection to operate modern public port. Demand for services in public port will be identified by Master Plan II and on this basis will be defined strategy for development of passenger and cargo port Bratislava. Goal for development of passenger port is to define port environment for cabin and cruise vessels on both riverbanks of Danube river in area of passenger port. The area of modernized passenger port will be used by operators of passenger transport, citizens, tourists and at the same will be providing the opportunity to direct contact with river and historical town centre and connections with city tourist programs, and other activities. This will have impact to raising customers of passenger port Bratislava.

For development of cargo port, Master Plan II will define the transshipping capacity of the port by the results of demand analysis. Master Plan II will design locations for transshipping positions in area of public ports and will design relocations of existing transshipping positions from Winter port to basin Pálenisko. The part of document will be the plan of storage capacity. Function of cargo port Bratislava, position of technologies and individual elements (e.g. transshipping infrastructure) of cargo port will be designed on basis of demand analysis results. Necessary part of Master Plan II will be elaborating of demand analysis, which will reflect current and future market requirements.

Proposed responsible organisation(s):	Public ports, jsc
Proposed duration:	25 months (study)
Proposed time frame:	8.2017 – 9.2019

Elaboration of Master Plan and Feasibility Studies for port of Komárno

The basic project structure reflects the needs and visions of the Komárno port. All activities are interconnected, and they are also intended to provide the analytical framework for development and subsequent investments into port development. The aim of the project is to encourage the feasibility and sustainability of the solutions proposed in the documents and to multiply the synergies of the Komárno port activities in order to achieve.

Both Master Plans consist of:

- Analytical part: analysis of the port´s relations, structure, its functioning, demand analysis and comparison with similar ports, etc.
- Strategic part: models of developments and their advantages, conditions of their implementation and impacts, etc.

Both Master Plans will be followed by Feasibility studies reflecting the Master Plan and is expected to be a fundamental methodical (systematic) document for further development and investments into Port´s development. The studies will consist of the assessment of the feasibility of different alternatives, analysis of the most suitable arrangement including technical and financial analysis, cash flow, CBA, EIA, etc.

Feasibility studies including the EIA and CBA will develop the most suitable solution for modernization of public port Bratislava. The project also includes technical study to define the technical solution of the modernization with preliminary budget.
The scope of the modernization will be defined on basis of the available studies and Master Plans, taking into account the current property-legal status of the port.

Proposed responsible organisation(s):	Public ports, jsc
Proposed duration:	51 months (study)
Proposed time frame:	9.16 – 12.20

Key stakeholders
The work on documentation will be supported, checked and considered mostly by Public ports, jsc. Other stakeholders will be defined after signature of contract with supplier. It is assumed that Ministry of Transport and construction of the Slovak republic, Transport authority, Slovak water management enterprise, municipalities of Bratislava and Komárno and Ministry of environment will be engaged in the elaborating process.

- Verejné prístavy, a.s. / Public ports, jsc
- Ministry of Transport and Construction of the Slovak Republic
- Transport Authority
- municipalities of Bratislava and Komárno
- Slovak Water Management Enterprise

Estimated timeline:
Master plan Bratislava - 2019
Feasibility study Bratislava – 2020-2021
Master plan Komárno - 2019
Feasibility study Komárno - 2020

Funding:
Master plan Bratislava – own resources
Feasibility study Bratislava- not yet confirmed (potentially OPII)
Master plan Komárno – CEF
Feasibility study Komárno - CEF

Objective 2: Improvement of existing port services
Multiple historical transformations, split of property rights and responsibilities, many years of underfunding, all combined with lowering attractiveness of water transport caused stagnation in terms of provided services and compliance with modern trends, such as waste management, eco-solutions etc. Port of Bratislava has the ambition to reach the level of advanced inland ports in the Rhine-Main region, where most of the Slovak industry's exports are directed and thus provide an adequate alternative. In freight transport in the context of intermodal transport and complex logistics services, there is a high demand for the transport of piece goods (including containers) and Ro-Ro freight. However, the offer of the port in freight transport is over-sized in the field of bulk goods transport. Currently there are no public facilities in public ports designed to provide ecological services related to the collection of ship-generated waste, refueling and potable water for vessels. The facility is planned to be in the location of the cargo port of Bratislava and will be used by the landing of the vessels.
Public port of Bratislava does not provide any organized waste collection from cargo vessels and does not allow access to alternative fuels (e.g. LNG).
The future intention is to make the port of Bratislava attractive through a wider portfolio of port, logistics, support and ancillary services. The main development site is considered to be the Pálenisko basin area. The reason for creation of Feasibility Study is the assumed availability of the land located in this part, which will be possible to develop after the solution of the port services.

Implementation measures

Waste management / Construction of the background for vessels in public port of Bratislava

The aim of the project is to elaborate technical and economic study to develop the most suitable waste collection and treatment solution in the public port of Bratislava, which will help to decrease the negative eco-impact of the public port and protect the environment. The project also includes the construction of infrastructure for the possibility of fuel supply to vessels in the public port of Bratislava.

The aim of the project is to build a facility to provide services related to fueling, water supply, waste collection (waste water, used oils, garbage) as well as additional services for vessels. The facility is planned to be located in the location of the cargo port of Bratislava and will be used by the landing of the vessels.

The technical and economic study will consist of the following parts:

- Demand analysis covering the needs of the market in the field of waste management and fuelling on the Danube international waterway (together with the identification of additional services requested by the users)
- Technical study
- Environmental Impact Assessment - EIA
- Cost-Benefit Analysis – CBA
- Construction of background for vessels that will help eliminate the transshipment of fuel on the free flow of the river Danube as well as discharges into rivers to prevent the risk of environmental accidents.

On the basis of the results of the Technical and Economic Study and in the sense of the identified technology of waste collection and processing, pumping of fuel and drinking water, the construction and installation of the floating facility in the locality of the cargo port Bratislava will be ensured. Part of the implementation will be the processing of project documentation.

Proposed responsible organisation(s):	Public ports, jsc
Proposed duration:	: to not yet concluded
Proposed time frame:	2020

Potential stakeholders involved:

- Verejné prístavy, a.s. / Public ports, jsc
- Ministry of Transport and Construction of the Slovak Republic
- Slovenská plavba a prístavy, jsc
- Slovenský plynárenský priemysel, a.s.

Estimated timeline:

Study – 2020

Realization – not yet confirmed

Funding:
Study – not yet confirmed
Realization – not yet confirmed

Eco-friendly solutions (alternative fuel)
The LNG terminal is planned to follow the wider distribution chain relationships, where the gas supplier supplies pipelines to the terminal in the port of Bratislava, which will then be processed and distributed by the waterway to the end user - other ports on the Danube, etc. As the LNG is not only a commodity traded, but also an LNG terminal is assumed to be used as an LNG. The terminal will contribute to the greening of the public port of Bratislava in line with the requirements for introducing alternative fuels in public ports within the EU countries as well as reducing negative environmental impacts. The LNG terminal will be a key logistics point for LNG tankers that supply petrol stations. At the same time, it can provide LNG-powered tanker services. The LNG terminal should have separate handling equipment for riverboats and motorboats. In addition, vessels and LNG tankers must have the option of further logistics and take over the LNG for further LNG transport along the Danube.
In addition, the planned alternative fuel terminal in Bratislava is already part of the European TEN-T corridor and is eligible for EU funding.

Proposed responsible organisation(s):	Public ports, jsc
Proposed duration:	: 15 months (study)
Proposed time frame:	: 4.19 – 7.20

Potential stakeholders involved:
- Public ports, jsc
- Ministry of Transport and Construction of the Slovak Republic
- Ministry of Environment of the Slovak Republic
- The Railways of the Slovak Republic
- Slovenská plavba a prístavy, jsc
- Slovenský plynárenský priemysel, a.s.

Estimated timeline:
Study – 2020
Realization – not yet confirmed

Funding:
Study – GBER
Realization – not yet confirmed

Objective 3: Attracting new companies and customers into ports
Company, as the authority of Slovak inland public ports is burdened by the significant number of long-term contracts concluded in the past. This is results of multiple transformations of port authorities / operator in the past. Existing commercial relations, therefore, together with the provision of insufficient funds, constitute one of the main obstacles to the further development of public ports in Slovakia.

The present state of ownership of the Bratislava port has, therefore, a negative impact on the existence of an optimal market environment, internal competition and the related development and quality of services offered to customers. The low level of competition means that there is insufficient motivation factor in the port to stimulate competitors to make efforts to increase demand and offer better quality services. Mentioned limitation has a major impact on the formulation of the long-term concept of the development of public ports in Slovakia. Long-term concept of the port development is defined by efficient use of land, real estate, infrastructure, superstructure, labour force, experience and funding.

Modernization requires significant investment. Since property rights in area of port is shared and activities are divided among multiple entities with different financial and funding opportunities, any major investments and modernization is from time and legal and financial point of view significantly limited.

Implementation measures

Lease of currently not used property (land, storage capacities)
Taking into consideration previous studies elaborated in relation to development of public ports of Bratislava and Komárno, currently, Landlord model is recommended for implementation. In view of the limited access to land, previous activities have been limited to the letting of sites by the port authority. Technical parameters and design of infrastructure and superstructures and, in the case of non-dominant operators, access to engineering networks and infrastructure are transferred to tenants / operators. In addition, the hydrodynamic conditions of floating port facilities in the conditions of the Bratislava port also require technical and technological knowledge that cannot normally be expected from smaller tenants. Implementation of full Land Lord Model considered as solution the most compliant with Public Ports, jsc from the financial and operational point of view. In order to ensure maximum port facility control and decision-making powers, the owner's recommended structure is when the port owns all the land and port infrastructure.

Ports that operate on this model include most of the ports in the EU, such as Hamburg, Rotterdam, Antwerp, but also New York and Singapore. This port model is currently dominant between medium and large ports. In the Landlord model, land and infrastructure are leased to private companies or businesses such as logistics companies, refineries, tanker terminals and chemical plants. Rentals that private companies pay for chartering land port is usually a fixed amount per square meter and a year typically indexed at a certain rate of inflation. The amount of the rent depends, among other things, on the costs of preparing and constructing the infrastructure. Private entities operating in the port maintain their own technologies and buildings (offices, warehouses, workshops), and procuring and installing their own

equipment on the terminal grounds. Employees are mostly employed by private entities operating in the port and in some cases part of staff may be selected from the internal market for employees within the port.

Proposed responsible organisation(s):	Public ports, jsc, ,Slovenská plavba a prístavy, jsc
Proposed duration:	not yet concluded
Proposed time frame:	not yet concluded

Objective 4: Improvement of communication with public authorities on planned activities

Communication with public partners is inevitable conditions for an efficient implementation of ongoing projects and search for new project ideas. Existence of functional communication flow avoids misunderstandings, unnecessary delays and generally fosters trust and cooperation. Some measures have been implemented to strengthen communication among all partners involved.

Implementation measures

Regular coordination meeting with relevant public stakeholders / authorities

Public ports, jsc in in contact with public and private stakeholders involved in inland waterway transportation. Current status of relations in the area of public ports in Bratislava and Komárno acts as constraint for many of potential development activities. Therefore, Public ports is in many areas limited to indirect actions only. One of them is to benefit from direct communication channel with Ministry of Transport and Construction of the Slovak Republic. There the company receives current information necessary for implementation of ongoing and planning of new project activities.

Meeting where representative of Public ports, jsc meet representatives of Ministry of Transport and Construction of the Slovak Republic and together discuss current relevant topics and present ideas and visions related to ongoing and planned projects take place regularly. Communication of other stakeholders, mostly those that are involved in activities in the area of public ports of Bratislava and Komárno take place ad hoc, not on regular basis.

Proposed responsible organisation(s):	Public ports, jsc, Ministry of Transport and Construction of the Slovak Republic
Proposed duration:	ongoing
Proposed time frame:	ongoing

Potential stakeholders involved:

- Public ports, jsc
- Ministry of Transport and Construction of the Slovak Republic
- Slovenská plavba a prístavy, jsc

Estimated timeline:
Ongoing

Objective 5: Proactive initiation of internal projects
According to Law on Inland Navigation the company Public ports, jsc has been established to ensure the preparation and implementation of the construction of public ports, including the processing of short and long-term concepts of their development, as well as the provision of operation, registration, maintenance and repairs of facilities in the area of public ports. Currently the infrastructure at public ports needs to reflect the requirements for port services and infrastructure and the feasibility study will develop the scope and objectives of necessary modernization. Public ports, jsc actively participates on multiple international projects. However, the modernization and future development of public ports is being covered by internal projects in the full responsibility of the company with various funding schemes. Currently ongoing internal projects are described in more detail in Objective 1 and Objective 2.

Implementation measures

Trainings and education of internal staff
Public ports, jsc supports the increase of knowledge of its employees related to legislation, project management, documentation, project funding, port administration and internal exchange of know-how. Employees participate on conferences and trainings organized by public authorities.

Proposed responsible organisation(s):	Public ports, jsc, Ministry of Transport and Construction of the Slovak Republic
Proposed duration:	ongoing
Proposed time frame:	ongoing

Estimated timeline:
Ongoing

Funding:
Own resources

Objective 6: Increase of competitiveness & Improvement of multimodality to promote combined transportation

Major milestone to achieve is modernization of services in public port Bratislava by supporting the deployment of alternative fuel infrastructure and construction of the most suitable waste collection and treatment solution in the public port of Bratislava to contribute to reducing negative environmental impacts of the port activities. The implementation of the current projects will contribute to the greening of the public port Bratislava in line with the requirements for the alternative fuels in public port within the EU countries.

In case of dislocation of current transshipment of liquid and loose materials from the area of the Winter Port into the Pálenisko basin, it is necessary to build new reinforced surfaces and follow-up access communications. At the same time, it is necessary to complete the margins for the landing of vessels for the purpose of loading and unloading goods and materials. The modernization and completion of ports and reinforced surfaces should cover all the land used in the past for transshipment, storage currently unloaded by lease agreements with other entities. By building new reinforced surfaces, a space for transshipment of goods and materials will be created around the banks of the Pálenisko basin by new transshipment technologies.

Major challenge still lies in the non-standard division of ownership relationships between Public ports, jsc, which owns land and major port operator (Slovenská plavba a prístavy, jsc) owning infrastructure and superstructure in public ports and long-term leasing the land from Public ports, jsc. This has to be resolved as the first step in any kind of modernization strategy.

Implementation measures

Increasing the transhipment capacities using the previously unused area owned by Public ports, jsc

Law, under which Public ports jsc was established exhaustively lists its responsibilities. The company is not directly involved in any kind of transportation or transhipment and it does not hold any cargo fleet. Such activities are exclusively provided by port operators and their contractual partners. Transhipment technology in the area of public ports Bratislava and Komárno is not being used on 100% and transhipment equipment requires modernization. Construction of new facilities covered by Public ports, jsc next to existing transhipment equipment owned by port operator would cause competition with no added value. Since one of milestones for future development is renegotiation of future ownership relations, such type of activities will be based on the future setup and cannot be planned in advance.

Proposed responsible organisation(s):	Public ports, jsc, ,Slovenská plavba a prístavy, jsc, Ministry of Transport and Construction of the Slovak Republic
Proposed duration:	not yet concluded
Proposed time frame:	not yet concluded

Objective 7: Trade negotiations with port operators

Current non-standard setup of ownership relations in the area of public ports of Bratislava and Komárno has negative impact on internal competition between multiple port operators. Establishment of measures that enable and support internal competitions would widen the development activities and increase the level of provided services qualitatively and quantitatively. Crucial milestone that has to be achieved is clear definition of future setup of ownership relations among multiple parties to the land, infrastructure, superstructure. Taking into consideration previous studies elaborated in relation to development of public ports of Bratislava and Komárno, currently, Landlord model is recommended for implementation. In view of the limited access to land, previous activities have been limited to the letting of sites by the port authority. Technical parameters and design of infrastructure

and superstructures and, in the case of non-dominant operators, access to engineering networks and infrastructure are transferred to tenants / operators. In addition, the hydrodynamic conditions of floating port facilities in the conditions of the Bratislava port also require technical and technological knowledge that cannot normally be expected from smaller tenants. Implementation of full Land Lord Model considered as solution the most compliant with Public Ports jsc from the financial and operational point of view. In order to ensure maximum port facility control and decision-making powers, the owner's recommended structure is when the port owns all land and port infrastructure.

Implementation measures

Setup of current non-standard division of ownership relations
Before any considerable development activities in the port, it is necessary to resolve the non-standard relationships in the port and establish ownership rights to the port infrastructure in favour of the port authority, Public ports jsc. Existing commercial relations, therefore, together with the provision of insufficient funds, constitute one of the main obstacles to the further development of public ports in Slovakia. A key step to ensure optimal port development, as per multiple studies carried out in the past, is to acquire the ownership of the infrastructure. In order to achieve this, four options for resolving the current non-standard setting of port ownership relations in the port are considerable, namely:

- Acquisition of infrastructure from a private legal entity / current owner and major port operator;
- Establishment of a joint venture with a private entity / current owner and major port operator;
- Replacement of part of land owned by Public ports, jsc for infrastructure owned by a private entity and major port operator (SWAP);
- Expropriation of infra and super structure as last and the most extreme way to acquire an ownership.

To solve the current situation, it must be respected that major port operator has not only undeniable ownership relationship with the property acquired in the privatization process but at the same time provides the decisive volume of performances at the Bratislava freight port.

Proposed responsible organisation(s):	Public ports, jsc, ,Slovenská plavba a prístavy, jsc, Ministry of Transport and Construction of the Slovak Republic
Proposed duration:	not yet concluded
Proposed time frame:	not yet concluded

Renegotiation after expiration of existing contracts
Current relations in the area of public ports in Slovakia are derived from long-term lease agreements with the current dominant operator, SPaP, enabling the lease of most usable land. In addition, formulation of some lease agreements makes it possible to lease land further to

third parties. Such situation multiplies the number of involved stakeholders with no direct legal relation and obligations towards Public ports, jsc. This conflicting ownership structure and ongoing discussions between several parties over the past period led to a stagnation of the Bratislava and Komárno Ports. However, long-term lease contracts are concluded for the limited time period and that opens the area for re-negotiation of mutual relations for the future. Public ports, jsc as port authority will follow the path specified in previous studies and that is to provide steps necessary for implementation of full Landlord port administration model in the area of public ports of Bratislava and Komárno. The fact that ports have their strategic importance and the vast majority of the land is clustered as Priority Investment Property, such negotiations will require involvement of many stakeholders, not only from private sector but also from Ministries and multiple public authorities.

Proposed responsible organisation(s):	Public ports, jsc, ,Slovenská plavba a prístavy, jsc, Ministry of Transport and Construction of the Slovak Republic
Proposed duration:	not yet concluded
Proposed time frame:	not yet concluded

Determination of minimum transhipment performance of port operator(s)

Law, under which Public ports, jsc was established exhaustively lists its responsibilities. The company is not directly involved in any kind of transportation or transhipment. Such activities are exclusively provided by port operations and their contractual partners. Therefore, the influence of the company Public ports, jsc on the volume of transhipped goods is significantly limited. It is then necessary to find another way to motivate subject in public ports to make progress in terms of quantity, quality, eco-friendliness and such. One of considerable measures to motivate subjects that are involved in activities related to transportation and transhipment to increase their performance, more actively search for new transhipment opportunities and expand in general is mentioned determination of minimum transhipment performance of port operator(s).

The most important factor that limits the development of public port in general is current setup of ownership relation. This makes also impossible for new port operators to access the area of public ports. Any kind of implementation of such measures is conditional upon re-negotiation of the whole model of port´s administration and management. Master plans for public ports of Bratislava and Komárno that are currently being prepared, in combination with subsequent Feasibility studies will define the most suitable strategy with particular measures to be implemented.

Proposed responsible organisation(s):	Public ports, jsc, ,Slovenská plavba a prístavy, jsc, Ministry of Transport and Construction of the Slovak Republic
Proposed duration:	not yet concluded :
Proposed time frame:	not yet concluded

Potential stakeholders involved:

- Public ports, jsc
- Slovenská plavba a prístavy, jsc

- Ministry of Transport and Construction of the Slovak Republic
- Dalby, jsc
- Port services, jsc
- Slovenský plynárenský priemysel, a.s.

Estimated timeline:
Not yet concluded

Objective 8: Increase of reactiveness related to public funding opportunities
Current technical state of public ports, infrastructure and transhipment technologies is the result of decades of transformations, non-standard property relations and underfunding. One of the most limiting factors during the past period was the (im)possibility to use public funding. Despite that the Operation Programme "Transport" implemented in the years 2007 – 2013, was allocated almost 30% of the total volume of funds for the whole period, the inland water transport was not included in its scope. Obtaining of EU funds thus required revising the Operation Programme. Except from the EU sources of co-financing, neither the Slovak State budget did designate funds for infrastructural improvement of inland waterborne transport. Lack of financial sources and opportunities for their obtaining was thus observed as one of the main obstacles of the Danube Ports development.

Implementation measures

Continuous monitoring of information sources of public support in order to provide a prompt reaction by the company in case of suitable calls
Since inland water transport is not excluded anymore it is possible to apply for public funding for projects related to waterway transport. Unfortunately, this is not available for all ports. Operational Programme Integrated Infrastructure (OP II) enables support of inland water transport but only in the port of Bratislava. The ports of Komárno and Štúrovo are not eligible. This is caused by the fact, that eligible beneficiaries have been pre-selected by the Slovak Ministry of Transport and Construction and, among other subjects, include the Public ports, jsc. The total volume of allocated funds for all types of transport is 3.139 billion EUR out of which 137 million EUR is addressed for the water transport. OP II aims to support multimodal single European transport area by investments into the TEN-T network, including the improvement of services provided in the public port in Bratislava. This budget is administered by the Slovak Ministry of Transport and Construction of the Slovak republic. This ministry also acts on behalf of the Slovak republic as founder of the company Public ports, jsc.

Public ports jsc in cooperation with external expert elaborated National state aid report under the project DAPhNE in 2018 that summarized current opportunities for usage of public funding. Company as well actively participates on regular coordination meetings at the Ministry of Transport and Construction of the Slovak Republic where the status of ongoing projects is discussed as well as future intentions for developments and increase of the level of services provided in the area of public ports in Bratislava and Komárno.

Company implemented active monitoring of public / governmental / EU websites related to funding opportunities in order to be immediately awarded in case of suitable opportunity. Within the subscription to governmental Partner search program under 3rdCall for Proposal (Danube Transnational Programme) company receives on almost daily basis overview of new project ideas and calls for cooperation from the whole Danube region.

Proposed responsible organisation(s):	Public ports, jsc
Proposed duration:	ongoing
Proposed time frame:	ongoing

Potential stakeholders involved:

- Public ports, jsc
- Ministry of Transport and Construction of the Slovak Republic

Estimated timeline:

Ongoing

7.3 Hungary

7.3.1 Mission

The common mission for ports in Hungary is:

"To deliver port services along the full Hungarian Danube section in a standardised good quality in a transparent and cooperative market environment."

A common mission of the ports in Hungary to assure the accessibility of the Danube waterway transportation on the full Hungarian section of the Danube. Currently, the modal share and the exploitation of the inland waterway freight transportation is far below the optimum. The role of the ports is to make intermodal services available for market players. The Hungarian ports make joint efforts to make the port services visible and transparent for the transport market, and standardise the service level in order to promote port services and IWW transportation as a whole.

7.3.2 Vision

The vision of Hungarian ports is:

"To become highly efficient multimodal hubs integrating inland waterway transportation into the complex intermodal transportation system of the region."

As cargo volumes increase and logistic chains and intermodal transport services are becoming more and more complex, inland waterway transportation in the Danube region can only be successful if becomes fully integrated into the intermodal transportation system. In this integration, ports play the key role as multimodal hubs connecting IWW with road and rail. The efficiency and service level of the ports will make trimodal integration happen. For this efficiency, the ports shall use the latest state of the art technologies in cargo handling, storage, IT and all other logistic services.

7.3.3 Objectives and measures

On the basis of the cumulative SWOT analysis (Annex I) of the port industry in Hungary, as well as the methodology described in Chapter 7.1, Table 16 demonstrates various strategies (strategic objectives) of the Hungarian port industry.

Table 16: Strategic development objectives for port industry in Hungary

	Opportunities (external, positive) O1: development of training and flexible working technologies (incl. e-learning, teleworking) O2: increasing container transport volume O3: increasing railway freight volume O4: increasing volume of potential ro-ro freight O5: higher efficiency in multimodality O6: the settlement of new industries with intermodal transhipment needs in Hungary O7: new funding sources for port development	**Threats** (external, negative) T1: limited Danube navigation conditions T2: competition of neighbouring ports T3: increasing exposure to flood T4: old and limited vessel fleet T5: unmatured and unclarified regulatory system for state aid to ports T6: competitive disadvantage of waterborne transport in technological development compared to rail and road
Strengths (internal, positive) S1: strong networking of Hungarian ports (HFIP) S2: coverage of the Hungarian section of the Danube with inland ports S3: optimal geographical location of ports along the Danube S4: significant reserves in transhipment capacities S5: strong market position in the transhipment of cereals	**Strength-Opportunity strategies** *Which of the port industry strengths can be used to maximize the opportunities that were identified?* S1O1: cooperative networks in HR development between Hungarian ports S3O6: attracting new companies and industries into ports S4O2: increasing container transhipment volume within ports S4O4: increasing ro-ro transhipment volume within ports	**Strength-Threat strategies** *How can the port industry's strengths be used to minimize the identified threats?* S1T1: agreement on self-regulatory elements of the market to assure transparency and fair competition S1T5T6: representation of the common interests and cooperation with the government to improve the regulatory framework S1S2S3T6: joint promotion of IWW transportation for potential users
Weaknesses (internal, negative) W1: outdated and degraded port infrastructure (both basic and access infrastructure) W2: low storage capacities W3: lack of experienced human resource in port operations W4: limited scope of professional trainings in port management and logistics W5: limited multimodality in several ports W6: outdated and manual port logistics systems, poor IT support W6: exposure to seasonality	**Weakness-Opportunity strategies** *Which actions can be taken to minimize the port industry's weaknesses using the opportunities that were identified?* W2O6: improved storage facilities in ports W3W7O1: human resource development of existing and to-be port staff W5O2: increasing container transhipment volume within ports W5O5: introducing new technologies for transhipment efficiency	**Weakness-Threat strategies** *How can the port industry's weaknesses be minimized in order to avoid the threats?* W1T1: assuring a minimum of 2,5 draft along the Hungarian section of the Danube W5T6: improving multimodality to promote combined transportation W6T6: introducing port logistics information system

W7: limited foreign language skills W8: lack of a comprehensive, long-term strategy for the port industry	W2W3W5W6O7: introducing new funding schemes for port development W8O7: agreement on a comprehensive long-term strategy	

(Source: HFIP)

Below table summarizes the strategies (strategic objectives) and their corresponding development measures necessary to reach the objectives and implement the agreed strategy.

Table 17: Strategic objectives and necessary development measures for Hungarian ports

Country	Strategic objectives	Necessary development measures
HU	Cooperative networks in HR development between Hungarian ports	• sharing good practices • introducing training and employment standards of ports
	Attracting new companies and industries into ports	• joint promotion and marketing • cooperation with investment promotion agencies
	Increasing container transhipment volume within ports	• development of technologies for moving and storing containers • joint promotion and marketing • cooperation with investment promotion agencies
	Increasing ro-ro transhipment volume within ports	• joint promotion and marketing • cooperation with investment promotion agencies
	Agreement on self-regulatory elements of the market to assure transparency and fair competition	• elaborating and introducing self-regulatory standards by the Hungarian Federation of Danube Ports
	Representation of the common interests and cooperation with the government to improve the regulatory framework	• continuous cooperation with relevant government bodies (including the European Commission and the State Aid Monitoring Office in Hungary)
	Joint promotion of IWW transportation for potential users	• joint promotion and marketing
	Improved storage facilities in ports	• building new storage facilities in ports
	Human resource development of existing and to-be port staff	• elaboration of training programmes • implementation of training courses
	Introducing new technologies for transhipment efficiency	• RTDI projects for new technologies • investing in new transshipment technologies
	Introducing new funding schemes for port development	• cooperation with government bodies to develop new schemes
	Agreement on a comprehensive long-term strategy	• comprehensive industrial assessment • strategy elaboration • identification of key projects
	Assuring min 2,5m draught along the Hungarian section of the Danube	• joint lobbying and cooperation with government bodies

Country	Strategic objectives	Necessary development measures
	Improving multimodality to promote combined transportation	• multimodality investments in ports
	Introducing port logistics information system	• development of port specific IT systems • development of a national port management IT system

(Source: HFIP)

Objective 1: Cooperative networks in HR development between Hungarian ports

Good quality human resources represent a crucial factor for the efficiency and the service level of the ports. Meanwhile, during the last years Hungarian ports have been facing new challenges in the field of HR. Quality workforce is becoming less accessible, wages are growing dynamically – therefore the ports need to react and adapt their HR strategies accordingly.

Implementing measures

Sharing good practices

There are emerging good practices in HR management among Hungarian port operators as employers. Sharing and adapting these good practices make all the ports more successful in the employment market. Good practices cover typically:

- the introduction of flexible employment models in ports;
- introducing technological developments, automation and robotics solution to make the use of live workforce more efficient;
- employer branding;
- corporate further training models;
- performance measurement and motivation models;
- re-designing business processes and work positions for better efficiency.

Proposed responsible organisation(s):	Port operators, HFIP, specialized consultancy companies, DPN
Proposed duration:	36 months
Proposed time frame:	Month 13 – Month 48

Introducing training and employment standards of ports

Developing training and employment standards for ports is the basis of any joint efforts in the field of human resource management and development. It shall include the defining and standardising the work positions and the respective competence requirements, that can serve as a basis for designing port-specific training and traineeship programmes (see also Objective 9).

Proposed responsible organisation(s):	Port operators, HFIP, Ministry of Finance State Secretariat for Labour Market and Training, universities, training institutions
Proposed duration:	24 months
Proposed time frame:	Month 13 – Month 36

Objective 2: Attracting new companies and industries into ports

The best way to increase transhipment volumes and thus market share of the ports is to attract new companies and industries into ports and nearby industrial parks. The target groups include both logistics and transport companies and industrial plants. The local presence of these companies in ports will automatically promote their use of the ports' services and exploit the opportunities of IWW transportation.

Implementing measures

Joint promotion and marketing

Currently ports are poorly promoted as industrial investment sites, and also, the communication strategy of the nearby industrial parks usually does not emphasise the proximity of the port as an advantage. Through a well-designed and systematic promotion and marketing activity, ports can be placed on the map of the investment sites, and also on the mental map of the potential investors.

Proposed responsible organisation(s):	Port authorities, port operators, HFIP, Minister responsible for national assets, DPN, local municipalities
Proposed duration:	84 months
Proposed time frame:	Month 13 – Month 96

Cooperation with investment promotion agencies

Most of the major industrial investments in Hungary selects the location for the investment in cooperation with the national (HIPA – Hungarian Investment Promotion Agency) or one of the local investment promotion agencies. Ports will strongly cooperate with these agencies to use their network and capacities to attract industrial investors into Hungarian ports.

Proposed responsible organisation(s):	HIPA, Port authorities, port operators, HFIP, Minister responsible for national assets, local municipalities
Proposed duration:	84 months
Proposed time frame:	Month 13 – Month 96

Objective 3: Increasing container transhipment volume within ports

To reach market stability and underpin growth, ports need to diversify in cargo types. Container transport has a rapidly growing market share and represent a cargo type that is highly intermodal. Waterborne container transportation on the Danube is although relatively modest, but rapidly growing segment especially between Romania and Hungary. Being present on the container transport segment is of crucial importance for ports.

Implementing measures

Development of technologies for moving and storing containers

The ports need to become technologically prepared for efficiently moving and storing containers. This requires technological development in both equipment (e.g. cranes, reach stackers), infrastructure (storage facilities) and IT solutions (e.g. smart sensors, container management systems).

Proposed responsible organisation(s):	Selected port operators
Proposed duration:	72 months
Proposed time frame:	Month 25 – Month 96

Joint promotion and marketing

The joint promotion and marketing measures described under Objective 2 shall also include communication messages positioning ports as multimodal container terminals.

Proposed responsible organisation(s):	Port authorities, port operators, HFIP, Minister responsible for national assets, DPN, local municipalities
Proposed duration:	84 months
Proposed time frame:	Month 13 – Month 96

Cooperation with investment promotion agencies

The cooperation with national local investment promotion agencies described under Objective 2 shall also include the collaboration in identifying investors seeking investment sites for container logistics investments.

Proposed responsible organisation(s):	HIPA, Port authorities, port operators, HFIP, Minister responsible for national assets, local municipalities
Proposed duration:	84 months
Proposed time frame:	Month 13 – Month 96

Objective 4: Increasing ro-ro transhipment volume within ports

To reach market stability and underpin growth, ports need to diversify in cargo types. The market developments of last years proved that there is an important and viable market opportunity for ro-ro transhipment in Danube ports, especially for new cars as cargo, serving the dynamically growing automotive industry in Hungary and Slovakia. Technological capacities for ro-ro transhipment exist in Hungarian ports, however, there is a large room to increase volumes.

Implementing measures

Joint promotion and marketing

Recent market analysis in the automotive sector show that an important factor for not using IWW transportation (and therefore, ports) by certain manufacturers is the lack of knowledge on the waterborne transport opportunities. Therefore, joint promotion and marketing measures described under Objective 2 shall also include communication messages positioning ports as intermodal hubs for rolling cargo.

Proposed responsible organisation(s):	Port authorities, port operators, HFIP, Minister responsible for national assets, DPN, local municipalities
Proposed duration:	84 months
Proposed time frame:	Month 13 – Month 96

Cooperation with investment promotion agencies

Practically all of the automotive industry investments during the last years selected he investment location based on the cooperation with the investment promotion agencies. Therefore, it is very important that these agencies should know and inform potential investors about the opportunities offered by IWW transportation. This shall become the integral part of the cooperation with national local investment promotion agencies described under Objective 2.

Proposed responsible organisation(s):	HIPA, Port authorities, port operators, HFIP, Minister responsible for national assets, local municipalities
Proposed duration:	84 months
Proposed time frame:	Month 13 – Month 96

Objective 5: Agreement on self-regulatory elements of the market to assure transparency and fair competition

Ports need to cooperate to create and strengthen the transparency of the market of port services, in order to promote the confidence of the consumers in the port industry as a whole.

Implementing measures

Elaborating and introducing self-regulatory standards by the Hungarian Federation of Danube Ports

For this purpose, Hungarian ports have already started to develop self-regulatory elements. The General Conditions of Contract (KÁSZ) for ports exists since 2015. The KÁSZ will be regularly updated and further self-regulatory standards will be elaborated.

Proposed responsible organisation(s):	HFIP
Proposed duration:	96 months
Proposed time frame:	Month 1 – Month 96

Objective 6: Representation of the common interests and cooperation with the government to improve the regulatory framework

The law on inland waterway transportation of Hungary – also regulating the operation of ports – was adopted in 1999. The twenty-year-old regulatory framework needs to be updated, tailored to the current regulatory needs of the industry and harmonised with the latest EU law, including competition rules for the state aid to ports.

Implementing measures

Continuous cooperation with relevant government bodies (including the European Commission and the State Aid Monitoring Office in Hungary)

The HFIP as the representative body of Hungarian ports shall closely cooperate with the Ministry of Innovation and Technology and the Hungarian State Aid Office to jointly design the new regulatory framework for ports.

Proposed responsible organisation(s):	HFIP, Ministry of Innovation and Technology and the Hungarian State Aid Office
Proposed duration:	30 months
Proposed time frame:	Month 1 – Month 30

Objective 7: Joint promotion of IWW transportation for potential users

Recent market analysis show that an important factor for not using IWW transportation (and therefore, ports) by cargo owners and freight forwarders is the lack of knowledge on the waterborne transport opportunities. Therefore, targeted promotion is needed to provide the potential users with reliable information.

Implementation measures

Joint promotion and marketing

Ports shall jointly act in order to launch a promotion and information campaign targeting all potential users, positioning inland waterway transportation and port services. This campaign shall focus on key messages that would influence the modal shift decisions made by cargo owners and freight forwarders. This promotion campaign shall run in an integrated way with the communication activities described under Objectives 2, 3 and 4.

Proposed responsible organisation(s):	Port authorities, port operators, HFIP, Ministry of Innovation and Technology, DPN
Proposed duration:	84 months
Proposed time frame:	Month 13 – Month 96

Objective 8: Improved storage facilities in ports

In order to improve the competitiveness of the ports, vertical diversification in the field of logistic services is also needed. Namely, the improvement of storage capacities for different types of goods is necessary. Ports offering solely loading and unloading services are very much dependent economically on the water level and navigability of the Danube. Meanwhile, ports

offering various storage services not only provide higher added value, but they can rely on all-year-around incomes.

Implementing measures

Building new storage facilities in ports
Building new storage facilities such as warehouses, silos or open-air storages, according to the goods already serviced in the respective ports, or for goods that are subject to future diversification of the port.

Proposed responsible organisation(s):	Port operators
Proposed duration:	96 months
Proposed time frame:	Month 1 – Month 96

Objective 9: Human resource development of existing and to-be port staff
Ports shall cooperate in order to organise the training activities adequately answering the HR needs of the ports. This has already been launched by HFIP and the University of Dunaújváros, by elaborating and successfully piloting a standardised training programme for port managers. This can serve as a model for further training programme development and implementation.

Implementing measures

Elaboration of training programmes
Design and elaboration of port-specific training programmes, according to the competence requirements identified for the different standard work positions at ports (see Objective 1). This would include shorter (max 9 month) training programmes and courses to offer maximum flexibility and fast responsiveness to the human resource development needs of the Hungarian ports. The possibility for the international recognition of the training programmes shall also be assessed.

Proposed responsible organisation(s):	HFIP, University of Dunaújváros, training institutions
Proposed duration:	24 months
Proposed time frame:	Month 13 – Month 36

Implementation of training courses
The developed training programmes and training courses shall be implemented in collaboration with various training institutions, that are legally entitled to run acknowledged training programmes, and operate a traineeship programme for the port industry.

Proposed responsible organisation(s):	HFIP, University of Dunaújváros, training institutions
Proposed duration:	72 months
Proposed time frame:	Month 25 – Month 96

Objective 10: Introducing new technologies for transhipment efficiency

Logistics and transport services are technology intensive and very responsive to technological developments. Currently, several significant technological changes are influencing the life of ports, including new intermodal technologies, automation, robotics, smart and AI solutions, block-chain based systems, alternative fuels, energy efficiency solutions etc. In order to remain competitive, ports shall follow the pace, or even, become the forerunners of adapting the latest technologies.

Implementing measures

RTDI projects for new technologies

Research and technological development projects need to carried out in order to adapt and introduce the latest technological development into the context of port operations. This would include several initiatives, e.g. smart sensor based internal traffic management systems for ports, block chain based transport management solutions, use of LNG and electrically powered equipment in ports, etc.

Proposed responsible organisation(s):	Port authorities, port operators, MLSZKSZ. Ministry of Innovation and Technology, National Office for RTDI, Budapest University od Technology and Economics
Proposed duration:	72 months
Proposed time frame:	Month 25 – Month 96

Investing in new transshipment technologies

Managing the modal shift of goods (loading goods from one transport mode to another) is the core service of ports. Technological development shall focus on raising the efficiency – especially reducing loading time – of the modal shift. This requires investment in the latest technologies offering fast and efficient intermodal loading.

Proposed responsible organisation(s):	Port operators
Proposed duration:	96 months
Proposed time frame:	Month 1 – Month 96

Objective 11: Introducing new funding schemes for port development

Market failures in the port industry – especially the unbalanced market competition between IWW and other transport modes – does not allow for a fully market-based financing of the port developments. State aid measures are needed to promote the necessary investments in ports.

Implementing measures

Cooperation with government bodies to develop new schemes
The HFIP as the representative body of Hungarian cargo ports is cooperating with ministries and other government institutions, in order to design state aid schemes that are well reflecting the development needs of the ports, while in full conformity with the competition policy rules of the EU. These schemes are developed as part of the preparation for the post-2020 EU funding period.

Proposed responsible organisation(s):	HFIP, Ministry of Innovation and Technology, State Aid Office, specialized consulting companies
Proposed duration:	18 months
Proposed time frame:	Month 7 – Month 24

Objective 12: Agreement on a comprehensive long-term strategy
All the above objectives shall be discussed and agreed by all relevant stakeholders including the ports, the Government, freight forwarders and logistic service providers, and the Danube municipalities. This is currently being implemented as part of the elaboration of the National Master Plan for Port Development.

Implementing measures

Comprehensive industrial assessment
A detailed analysis is carried out assessing the current status of Hungarian ports, the market needs and future expectations. The assessment uses various tools such as market studies, questionnaire surveys, statistical analysis and technological assessment of the ports.

Proposed responsible organisation(s):	Ministry of Innovation and Technology, MAHART, HFIP, EX ANTE Consulting
Proposed duration:	3 months
Proposed time frame:	Month 1 – Month 3

Strategy elaboration
As part of the National Master Plan for Port Development, a comprehensive development strategy is being elaborated and discussed by all relevant stakeholders of the Hungarian port industry.

Proposed responsible organisation(s):	Ministry of Innovation and Technology, MAHART, HFIP, EX ANTE Consulting
Proposed duration:	6 months
Proposed time frame:	Month 1 – Month 6

Identification of key projects
Deriving from the strategy, the most important key projects for port development are to be identified and elaborated. The projects form organic part of the National Master Plan for Port Development.

Proposed responsible organisation(s):	Ministry of Innovation and Technology, MAHART, HFIP, EX ANTE Consulting
Proposed duration:	6 months
Proposed time frame:	Month 1 – Month 6

Objective 13: Assuring min 2,5m draught along the Hungarian section of the Danube
Port industry, naturally, is very much dependent on the navigability conditions of the Danube. Currently the navigability of the Hungarian section of the river is in very bad condition: during 2018, fully loaded vessels were unable to navigate for more than half of the year. For the business stability of the port industry, a calculable and reliable navigability situation must be reached on the Danube.

Implementing measures

Joint lobbying and cooperation with government bodies
In February 2019, the elaboration of the National Master Plan for Danube Waterway Development was launched in Hungary. During the elaboration of the master plan, ports shall act jointly to represent the interests of the port industry regarding waterway development.

Proposed responsible organisation(s):	Port authorities, port operators, HFIP, Ministry of Innovation and Technology, DPN, Consortium preparing the Master Plan
Proposed duration:	36 months
Proposed time frame:	Month 1 – Month 36

Objective 14: Improving multimodality to promote combined transportation
As cargo volumes increase and logistic chains and intermodal transport services are becoming more and more complex, inland waterway transportation in the Danube region can only be successful if becomes fully integrated into the intermodal transportation system. In this integration, ports play the key role as multimodal hubs connecting IWW with road and rail. This requires the high quality accessibility of ports via road and rail.

Implementing measures

Multimodality investments in ports
In order to establish and improve the multimodal accessibility of ports, the missing links and last mile connections shall be built or renovated, for both rail and road.

Proposed responsible organisation(s):	Port authorities, Ministry of Innovation and Technology, NIF, local municipalities
Proposed duration:	60 months
Proposed time frame:	Month 13 – Month 72

Objective 15: Introducing port logistics information system
Technological preparedness of Hungarian ports definitely requires the development and introduction of IT systems effectively supporting the functioning of the ports.

Implementing measures

Development of port specific IT systems

Port specific IT systems shall be designed and implemented in each Hungarian cargo port. These systems shall support the management of the everyday operation in the ports, including traffic management, vehicle recognition and access systems, internal communication between the different port operators within the port, goods and cargo handling and security.

Proposed responsible organisation(s):	Port authorities, port operators, HFIP, IT companies
Proposed duration:	48 months
Proposed time frame:	Month 7 – Month 54

Development of a national port management IT system

The overall objective of this Action, currently implemented as part of a CEF funded project, is to develop an integrated inland port ICT application to streamline administrative formalities through better use of information, communication and positioning technologies. To deliver on the overall objective, the Action will develop, test and validate an integrated inland port information system in line with the provision of Commission Regulation (EC) No 414/2007 of 13 March 2007. It consists of four activities:

- project management;
- design of pilot system;
- pilot system implementation and testing, and
- exploitation of results.

Proposed responsible organisation(s):	RSOE, HFIP, Ministry of Innovation and Technology
Proposed duration:	18 months
Proposed time frame:	Month 1 – Month 18

7.4 Croatia

7.4.1 Mission

"To establish preconditions for providing efficient and high-quality port service"

All inland ports in Croatia have one common thing, that is not sufficient and modern infrastructure and subsequently superstructure. Same situation is with Vukovar Port, only Croatian port on Danube River. Infra and superstructure, together with service performance influence directly on the Port's work.

Making the preconditions for good service providing means that port must have good infrastructure and superstructure in order to be able to obtain its job. One of the preconditions is making a good basis for the port development in the sense of concessions granting processes to be as less complicated as possible.

7.4.2 Vision

"To have one modern, state of the art port infrastructure and high-quality recognizable port service public port on Danube in Croatia".

Future Vukovar Port development should be built on well planned and analysed strategic documents basis and mid-term plans together with concession granting plans. All those documents should foresee realistic scenario for the port development and the role of the Port of Vukovar positioned on the international market that should have consequently high-quality and recognizable port service.

7.4.3 Objectives and measures

On the basis of the cumulative SWOT analysis (Annex I) of the port industry in Croatia, as well as the methodology described in Chapter 7.1, Table 18 demonstrates various strategies (strategic objectives) of the Croatian port industry.

Table 18: Strategic development objectives for port industry in Croatia

	Opportunities (external, positive)	**Threats** (external, negative)
	O1: Good position of port on the Danube O2: Navigability during the whole year O3: Accessibility - good connectivity with main road corridors and railway connection O4: Favourable geographical location on European transport corridor VII	T1: Lack of port capacities T2: Lack of the vertical quay T3: Limited space of the port area which is also in the process of decreasing T4: Various owners of the land within the port area T5: Lack of financial means for buying off the land T6: Long periods of realization

	O5: Establishing the port area as 100% state owned and managed O6: Legal rules flexibility improvement in order to enable better market adjustments for port operators O7: Finding new financial investments opportunities (public-private partnership, EU funds) O8: Building new capacities in accordance with market demands O9: Designating the railway (subject of the future railway modernization project) for industrial purposes and returning this part into port area O10: Regulation of the port bank O11: Preparation of quality strategic and concession plans for port O12: Marketing activities improvement	T7: Lack of strategic mid-term development plans T8: Part of the port area – land together with infrastructure privately owned T9: The entrance to the port is not adjusted – it is difficult to manage the port traffic T10: Lack of long term agreements between port operators and port users
Strengths (internal, positive) S1: State interest – investment and management guarantee S2: State interest protection by port authority – public service activities defined by the law S3: Port management – one body port authority S4: Port area – mostly state owned S5: Public port accessibility for all users under same conditions S6: Continuity of port services guaranteed S7: Long term experience of port services providing S8: Marketing activities improvement S9: EU projects experience S10: Educated staff of port authority	**Strength-Opportunity strategies** *Which of the port industry strengths can be used to maximize the opportunities that were identified?* S1S2S3S4S5O5: Defining the port area of inland public ports 100% state owned and managed by the state body (port authorities). S8S9O7O8: Using the financial opportunities for achieving the funds for modernization & new port capacities.	**Strength-Threat strategies** *How can the port industry's strengths be used to minimize the identified threats?* S1S5S10T7T8T9: Preparation of high quality port development plans which shall be basis for concessions granting and PPP opportunities.
Weaknesses (internal, negative) W1: No stabile market and traffic for port operators – insecurity W2: Costs of buying off the land W3: Long expropriation procedures (when the owner refuses to sell his land)	**Weakness-Opportunity strategies** *Which actions can be taken to minimize the port industry's weaknesses using the opportunities that were identified?*	**Weakness-Threat strategies** *How can the port industry's weaknesses be minimized in order to avoid the threats?* W7W10T1T8T9: Strategic planning together with quality

W4: Project Canal Danube – Sava – realization uncertainty – reflects directly on port development plans W5: Project Canal Danube – Sava – possibility of goods decreases and current Port location change W6: Railway – passenger traffic – instead of port development W7: Low quality of development plans which directly reflects on possibility for EU funds applying W8: Not fulfilling obligation of concession agreements by the operators in the sense of cargo amounts and investment plans W9: Old equipment of port operators and obsolescence of technologies W10: Long procedure for port area expanding	W8O6: Adjusting the special laws in order to make legal rules flexible as possible due to general regulations (concessions). W1W7O7: Strategic plans adjusted for PPP opportunities.	concession plans preparation in order to use port capacities to the maximum and make the concession agreements real and fulfilled.

(Source: PAV)

Below table summarizes the strategies (strategic objectives) and their corresponding development measures necessary to reach the objectives and implement the agreed strategy.

Table 19: Strategic objectives and necessary development measures for Croatian ports

Country	Strategic objectives	Necessary development measures
HR	S1S2S3S4S5O5: Defining the port area of inland public ports 100% state owned and managed by the state body (port authorities)	• Adjustment of the existing inland ports regulations to make preconditions for all port land within the public ports to be owned and managed by state port authorities • Solving ownership issues model development • Finding financial or other means to compensate to current land owners • Involvement of the state body – Ministry of the Sea, Transport and Infrastructure • Defining the timeframe for activity completion
	S8S9O7O8: Using the financial opportunities for achieving the funds for modernization & new port capacities	• Preparation of a high-quality development plans • Education of the staff in Ministry of the Sea, Transport and Infrastructure and Port Authorities for project preparation and implementation • Ensuring the financial means for preparation activities • Defining realistic priorities and sustainable projects for financing

Country	Strategic objectives	Necessary development measures
		• Synergy between Ministry and port administrations activities
	S1S5S10T7T8T9: Preparation of high-quality port development plans which shall be basis for concessions granting and PPP opportunities.	• Preparation of the quality basis (master plans, feasibility studies) which shall be used for development plans of inland ports development • Defining the roles and timeframe for basis documents making
	W8O6: Adjusting the special laws in order to make legal rules flexible as possible due to general regulations (concessions).	• Adjusting the current Law on Inland Navigation and Ports in order to maximize concessions rules flexibility in inland ports especially in the terms for contract changing in accordance with market changes • Foresee concessions granting upon demand/request when it is possible and not in contrary with principle of competition • Defining the port area of inland ports 100% state owned as the measure for concession granting process be more efficient
	W1W7O7: Strategic plans adjusted for PPP opportunities	• Take into account PPP regulations taken into account when long-term and short-term strategic plans preparing • Ensuring the preconditions for PPP
	W7W10T1T8T9: Strategic planning together with quality concession plans preparation in order to use port capacities to the maximum and make the concession agreements real and fulfilled.	• Strategic plans and the basis for them should consist on realistic figures and possible scenarios • Strategic plans and concession plans should take into account market and economic environment needs and possibilities

(Source: PAV)

Objective 1: Defining the port area of inland public ports 100% state owned and managed by the state body (port authorities)

At this moment Law on Inland Navigation and Inland Ports defines public ports as ports of specific economic interest for the State. But the port land, in theory, could belong to different owners what is an aggravated circumstance in port development processes. That means that processes as concession granting and investments are difficult to obtain. Our opinion is that all the port land should be owned by the State and managed by the Port Authority and this should be stated in afore mentioned Law.

Implementation measures

Adjustment of the existing inland ports regulations to make preconditions for all port land within the public ports to be owned and managed by state port authorities

Existing Law on Inland Navigation and Inland Ports should be adjusted/changed in order to ambiguously state that all the land within public ports must be State owned.

Proposed responsible organisation(s):	Ministry of the Sea, Transport and Infrastructure
Proposed duration:	6 months
Proposed time frame:	June-November 2019

Solving ownership issues model development

When the Law on Inland Navigation and Inland Ports is changed model for the ownership issues solving should be developed. For the part of the land that could mean buying off the land, expropriation or even review of the privatization process for the part of the port land. Some of the State-owned land in the privatization process became privately owned.

Proposed responsible organisation(s):	Ministry of the Sea, Transport and Infrastructure
Proposed duration:	5 years
Proposed time frame:	2019-2024

Finding financial or other means to compensate to current land owners

In order to achieve the goal and to have 100% land owned in the Vukovar Port, financial resources should be provided by the State and this might be the biggest obstacle in achieving this Objective.

Proposed responsible organisation(s):	Ministry of the Sea, Transport and Infrastructure
Proposed duration:	5 years
Proposed time frame:	2019-2024

Involvement of the state body – Ministry of the Sea, Transport and Infrastructure

Ministry of the Sea, Transport and Infrastructure should be involved in all activities, starting from defining the State policy regarding this objective and in realization of measures defined.

Proposed responsible organisation(s):	Ministry of the Sea, Transport and Infrastructure
Proposed duration:	5 years
Proposed time frame:	2019-2024

Defining the timeframe for activity completion

One of the inevitable parts of the process is the timeframe definition for the activities. Changing the Law is not demanding in the time sense. The most demanding part is financial resources which shall be crucial for the timeframe definition.

Proposed responsible organisation(s):	Ministry of the Sea, Transport and Infrastructure and Vukovar Port Authority
Proposed duration:	1 month
Proposed time frame:	January-February 2020

Objective 2: Using the financial opportunities for achieving the funds for modernization & new port capacities

In order to achieve and use good financial opportunities for port infrastructure building there should be good basis for that. That means good development strategies and realistic development plans. There are financial opportunities that can be used in order to achieve gaining new capacities and modernization of inland ports.

Implementation measures

Preparation of a high-quality development plans

Development plans and strategies are crucial for reaching this objective. Plans represent basis for the sustainable and strategic port development. Every investment should be well planned and foreseen in long and mid-term development plans. Having the Mind-term Inland Development Plan is obligatory, and it is so stated within the Law on Inland Navigation and Inland Ports. Previous Mid-term Development Plan had expired in 2016 and now the public procurement for the new one is ongoing. That means that there is a gap between 2016 and 2019 which is not good for the inland navigation projects realization in Croatia.

Proposed responsible organisation(s):	Ministry of the Sea, Transport and Infrastructure
Proposed duration:	For example: 12 months
Proposed time frame:	July-December 2019

Education of the staff in Ministry of the Sea, Transport and Infrastructure and Port Authorities for project preparation and implementation

To ensure this certain objective to be reached, staff from institutions involved in those activities should be educated for project preparation and implementation. That means they should attend educations and seminars to be informed about opportunities and sources for financing and to be skilled for the implementation.

Proposed responsible organisation(s):	Ministry of the Sea, Transport and Infrastructure
Proposed duration:	1 year
Proposed time frame:	January-December 2020

Ensuring the financial means for preparation activities

Preparation activities are important part for project realization. There are always some costs which are needed in order to prepare the project well. It is important to foresee such costs and make them available for the Port Authority or Ministry.

Proposed responsible organisation(s):	Ministry of the Sea, Transport and Infrastructure and Vukovar Port Authority
Proposed duration:	6 months
Proposed time frame:	July-December 2019

Defining realistic priorities and sustainable projects for financing

As mentioned in measure 1 for this Objective it is very important to have high-quality development plans and they should also be realistic and sustainable. That means they should make sense in long-term period in the context of port development directions, maintenance costs etc. They should be realistic in the terms of cargo volumes foreseen and overall needs and development perspectives.

Proposed responsible organisation(s):	Ministry of the Sea, Transport and Infrastructure and Vukovar Port Authority
Proposed duration:	12 months
Proposed time frame:	July-December 2019

Synergy between Ministry and port administrations activities

Ministry is, is in general, in charge for the port development policy defining together with port authorities in each port. When preparing strategies and development plans there needs to be a close cooperation between those institutions in order to exchange information and to have a necessary feedback from port authorities and port operators.

Proposed responsible organisation(s):	Ministry of the Sea, Transport and Infrastructure and Vukovar Port Authority
Proposed duration:	3 months
Proposed time frame:	July-September 2019

Objective 3: Preparation of high-quality port development plans which shall be basis for concessions granting and PPP opportunities.

Port development plans are derived from the State strategic documents (Transport Development Strategy, River Traffic Strategy) and they are: Mid-term Port Development Plan and port operator's concession plans. All documents should be based on good basis and quality approached studies. Development plans should foresee future port development and funding models for its realization. Funding models could be public (state) investments, port operators' investments in port superstructure during the concession grant period and public-private partnership.

Implementation measures

Preparation of the quality basis (master plans, feasibility studies) which shall be used for development plans of inland ports development

Good planning on mid and long-term level must be based on high-quality studies which should be done by qualified staff. They should consider all external and internal factors that influence port development or could influence it. Master plans and feasibility studies should foresee

different development scenarios and they should comprise all important information including local government spatial planning, movement of goods, economic surrounding, environmental elements etc.

Proposed responsible organisation(s):	Ministry of the Sea, Transport and Infrastructure and Vukovar Port Authority
Proposed duration:	6 months
Proposed time frame:	July-December 2019

Defining the roles and timeframe for basis documents making

In order to have all necessary development plans which are up to date and relevant it is necessary to divide the roles and responsibilities for each participant in documents preparation and timeframe for its realization. It is not good that development plans go out of date or out of force and ports cannot do any serious investments.

Proposed responsible organisation(s):	Ministry of the Sea, Transport and Infrastructure and Vukovar Port Authority
Proposed duration:	1 month
Proposed time frame:	July-August 2019

Objective 4: Adjusting the special laws in order to make legal rules flexible as possible due to general regulations (concessions).

Legislative frame considering concession granting in ports implies general law on concessions and special law including concession rules that is Law on Inland Navigation and Ports. Concession regulations are strict in general and Concession Law, partly, gives the opportunity to special laws to define some rules for concession itself. Law on Inland Navigation and Ports should define concession granting rules as flexible as possible in order to concession agreements can adjust to fast market changes.

Implementation measures

Adjusting the current Law on Inland Navigation and Ports in order to maximize concessions rules flexibility in inland ports especially in the terms for contract changing in accordance with market changes

Law on Inland Navigation and Ports should, having in mind that concessions agreements last 10 and more years, foresee that some concession agreement whenever it is in line with Law on Concessions could be adjusted. Current rules are too strict and whenever the port operators' program is not realized the agreement should be terminated. Practice showed that this is not realistic and not good for the port development. Such situation gives certain insecurity for the port authority and for the port operator and this should be avoided when possible.

Proposed responsible organisation(s):	Ministry of the Sea, Transport and Infrastructure
Proposed duration:	3 months
Proposed time frame:	June-August 2019

Foresee concessions granting upon demand/request when it is possible and not in contrary with principle of competition

Main rule for concessions granting is public tendering procedure and it is so defined in the Law on Concessions. In some cases, there is a possibility to grant the concession only upon request and to simplify the procedure. Our opinion is that such regulations should be included in the specific law. For example, for "simple" port activities, as quality control of cargo, there should be concession upon demand when there is not rule of competition undermined.

Proposed responsible organisation(s):	Ministry of the Sea, Transport and Infrastructure
Proposed duration:	3 months
Proposed time frame:	June-August 2019

Defining the port area of inland ports 100% state owned as the measure for concession granting process be more efficient

As it was mentioned before, port land within the port area is mostly owned by the State, but in some percentage, it is owned by the private companies or persons. This represents an obstacle for concessions granting procedures which are already complicated. Law on Concessions does not demand for all the land where concession is to be given to be owned by the State in 100%. It gives the opportunity that, before concession agreement is going to be concluded, future operator resolves legal relations with port owner.

Proposed responsible organisation(s):	Ministry of the Sea, Transport and Infrastructure
Proposed duration:	6 months
Proposed time frame:	June-November 2019

Objective 5: Strategic plans adjusted for PPP opportunities

Strategic documents, together with the development plans, should be adjusted for public private partnership in ports of public interest. Those documents should be a platform for port investment opportunities, not limiting factors. They should be based upon good analysis.

Implementation measures

Take into account PPP regulations taken into account when long-term and short-term strategic plans preparing

Public private partnership regulations should be considered when strategies and development plans are prepared. Rules for public private partnership should be a part of Law on Inland Navigation and Ports as much as possible. Investments procedures should be simplified and clear to investors.

Proposed responsible organisation(s):	Ministry of the Sea, Transport and Infrastructure
Proposed duration:	6 months
Proposed time frame:	July-December 2019

Ensuring the preconditions for PPP

To have preconditions for public private partnership within the port, beside well-prepared strategic plans there must be simplified procedure regarding the usage of the port land and port infrastructure. Rules for building within the port and maintenance rules (after the investment is realized) should be clear for the investors.

Proposed responsible organisation(s):	Ministry of the Finance, Ministry of the Sea, Transport and Infrastructure
Proposed duration:	18 months
Proposed time frame:	July 2019-December 2020

Objective 6: Strategic planning together with quality concession plans preparation in order to use port capacities to the maximum and make the concession agreements real and fulfilled.

Beside strategic documents, concessions granting plans are important for the port development. There is a three-years concession plan and a yearly concession plan which are prepared by the port authority in line with a Mid-term Development Plan. Concessions should be given for the terms long enough for the investments to be cost effective for the investors. At the same time concession agreements should be possible to change if some big market disturbance happens.

Implementation measures

Strategic plans and the basis for them should consist on realistic figures and possible scenarios

Strategies are always general documents, without many details. But they should be based on detailed analysis external and internal port development factors as well as economic surrounding analysis. They are based on pre-feasibility and feasibility studies. Concession plans, proposed by the port operators, became a part of concession grant contracts once they are signed. If the port operator plan is not realized concession contract must be terminated. This happens mostly because port operator plans are not realistic, and they are not based on real figures and facts.

Proposed responsible organisation(s):	Ministry of the Sea, Transport and Infrastructure, Vukovar Port Authority
Proposed duration:	6 months
Proposed time frame:	July-December 2019

Strategic plans and concession plans should take into account market and economic environment needs and possibilities

As already mentioned, all strategic and port planning documents must be based on all relevant factors that could influence port development, although they do not have to be directly connected to port activities but could influence it someway.

Proposed responsible organisation(s):	Ministry of the Sea, Transport and Infrastructure, Vukovar Port Authority
Proposed duration:	6 months
Proposed time frame:	July-December 2019

7.5 Serbia

7.5.1 Mission

The common mission for ports in Serbia is:

"Raise the overall level of service quality in inland waterway transport through the provision of competitive port services, and create business environment which will enable sustainable development of ports as well as local and national economy."

Setting up the level playing field is of great importance for the sustainability and development of ports. Port sector reform was initiated with the new legal and strategic framework, while PGA started the implementation defining port areas and licensing port operators. Where possible, extension of port areas will be elaborated through the spatial and other planning documentation, and eventually additional operators will be selected and licensed. Competition in and/or between ports raise the quality level of services provided in ports and keeps the market competitive. Possibilities for the development of free and industrial zones in the vicinities of ports are also in the focus of national and local authorities, as the level of industrial development and trade in the port hinterland is directly affecting the performance of ports.

7.5.2 Vision

"A highly organized and profitable port industry that provides the highest level of service to carriers and shippers, constantly advancing and raising the level of service in the ports of the Republic of Serbia".

As facilitators of international trade, ports are considered as the driving force of the economy in their hinterland. This is the main reason why they are treated as goods of common public interest. Within the adopted regulatory framework landlord management model was introduced, enabling state to continue with major investments in construction of the new and modernization of existing infrastructure. Consequently, port operators/concessionaires will have more flexibility for investments in port superstructure and equipment. Well regulated business environment will also contribute to the competitive port services market, where port operators will attract customers with the high quality of provided services.

7.5.3 Objectives and measures

On the basis of the cumulative SWOT analysis (Annex I) of the port industry in Serbia, as well as the methodology described in Chapter 7.1, Table 20 demonstrates various strategies (strategic objectives) of the Serbian port industry.

Table 20: Strategic development objectives for port industry in Serbia

	Opportunities (external, positive) O1: Rhine Danube Core Corridor Network O2: One belt one road O3: Redevelopment of industrial production O4: Containerization O5: Modal shift O6: Ecological awareness	**Threats** (external, negative) T1: Danube navigability T2: Unstable market and demand for port services T3: Road & Railway transportation T4: Different custom area T5: Lack of qualified stuff T6: Global economy
Strengths (internal, positive) 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 and flexible Port Operators S6: Multimodality S7: Navigability of the Serbian section of the river Danube	**Strength-Opportunity strategies** Which of the port industry strengths can be used to maximize the opportunities that were identified? S1S2S5O1O2O3: High quality of port services through the fair competition and equal market opportunities. S2S3S6O1O2O3O4: Industrial development in the port immediate hinterland	**Strength-Threat strategies** How can the port industry's strengths be used to minimize the identified threats? S2S3S4S6T1T3T6: Become substantial part of the logistics chain S1S5T5: Human resource development
Weaknesses (internal, negative) W1: Port infrastructure W2: Old equipment 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 or certain industry in the hinterland	**Weakness-Opportunity strategies** Which actions can be taken to minimize the port industry's weaknesses using the opportunities that were identified? W1O1O2O3O6: Development of the new infrastructure and redesign of the old infrastructure in ports W2W3W4W5O1O2O3O4: Sustainable investments in port superstructure	**Weakness-Threat strategies** How can the port industry's weaknesses be minimized in order to avoid the threats? W1W2W3W5T1T2T3: Improvement of multimodality

(Source: PGA)

Below table summarizes the strategies (strategic objectives) and their corresponding development measures necessary to reach the objectives and implement the agreed strategy.

Table 21: Strategic objectives and necessary development measures for Serbian ports

Country	Strategic objectives	Necessary development measures
RS	High quality of port services through the fair competition and equal market opportunities.	• Licensing additional operators where possible. • Close coordination with other authorities (custom, police, inspection...) and creation of single window procedure
	Industrial development in the port immediate hinterland	• Close collaboration with Ministry of Economy, Local self- governments and other Governmental institutions in charge for industrial development. • Active role in the development of spatial planning documentation • Joint promotion activities
	Become substantial part of the logistics chain	• Include more ports in core/comprehensive TEN-T network • Develop user friendly tools for multimodal transportation planning (logistics platform) • Joint promotion activities
	Human resource development	• Establish continuous education, from top and middle management to dockworkers and equipment operators • Organizing courses and trainings for the implementation and use of new technology and IT • Share good practice with other ports (from the network and external)
	Development of the new infrastructure and redesign of the old infrastructure in ports	• Assess founding possibilities • Promote PPPs – Port Concessions • Prepare technical documentation
	Sustainable investments in port superstructure	• Introduce new technologies • Construction of necessary (missing) port storage facilities • Purchase of the new equipment
	Improvement of multimodality	• Construction of missing port access railway/roads • Purchase of the necessary equipment • Develop user friendly tools for multimodal transportation planning (logistics platform) • Joint promotion activities

(Source: PGA)

Objective 1: High quality of port services through the fair competition and equal market opportunities.

With the development of new legal framework for ports and inland navigation in 2010, port sector reform was initiated in the Republic of Serbia. Three years later Port Governance Agency was established, and five years later Strategy for waterborne transport development, which included ports and harbours, was introduced. Through the implementation of the adopted landlord port model and strategic framework, process of determination of port areas and licensing port operators started. The goal is to create the environment where competent port operators will provide competitive public services. Considering the natural monopoly of ports and gradual industrial development of port hinterland, the policy is oriented toward the introduction of new port operators where possible. Healthy competition in and/or between ports consequently will lead to the increase of the quality level of port services on the market.

Implementation measures

Licensing additional operators where possible

Throughout the industrial transition process, some industrial ports have opened their capacities for providing port services to a third party. By fulfilling legal terms and conditions, some of them have qualified for the permit to perform commercial port operations. To such entities, PGA has, or will issue licence for providing port services. Currently there are 23 licensed port operators.

Also, for the type of services which are identified that are missing in certain ports, PGA will in line with the market requirements elaborate possibilities for licensing additional operators through the public tenders. Missing infrastructure/superstructure would be developed through the public private partnership on the available area in existing ports.

On the other hand, for the large scale projects such as construction of the New Port of Belgrade, or Terminal for general and dry bulk cargo in the Port of Smederevo, infrastructure would be constructed and financed by the public side, while concession for construction of superstructure and providing of port services would be awarded to a private partner through the public tender.

Proposed responsible organisation(s):	Port Governance Agency
Proposed duration:	Continuous, in line with port development plans
Proposed time frame:	Month 01 – Month 96

Close coordination with other authorities (custom, police, inspection...) and creation of single window procedure

Most of administrative procedures related to the border control, ensuring safe and secure flow of people and goods, are old and outdated. Currently, Serbia is the only country out of EU zone in the mid part of the river Danube. Despite the fact that all of the authorities involved are harmonising legislation and procedures with EU, there is lack of coordination and administrative bottlenecks are still present.

Working group, consisting of representatives of Ministry of Construction, Traffic and Infrastructure (Harbour masters' offices, inspections etc.) Port Governance Agency, Ministry of Finance (Custom office), Ministry of internal affairs (Border police), Ministry of Agriculture

(Food and other inspections), has been established. By the end of the year (2019), working group has to propose the bylaw to the Government, which will regulate the regime of border control on Inland Waterways. According to the plan, reporting, border control and other inspections will be done at the first port of destination in Serbia (for the goods in import), or last port of departure (for the goods in export), while check-up for the transiting vessels will be done in Veliko Gradište and Bačka Palanka on the river Danube, Sremska Mitrovica on the river Sava, and Kanjiža on the river Tisa. Border control will also be enabled at all international passenger terminals as well.
In the meantime, Ministry of internal affairs, in coordination with other relevant institutions is updating decisions on border crossing areas in ports. Once the new framework is set, procedures and forms harmonised, further improvement can be achieved through the digitalisation (use of Port Community System or similar tools).

Proposed responsible organisation(s):	Ministry of Construction, Traffic and Infrastructure (Harbour masters offices, inspections etc.) Port Governance Agency, Ministry of Finance (Custom office), Ministry of internal affairs (Border police), Ministry of Agriculture (Food and other inspections)
Proposed duration:	12 months
Proposed time frame:	Month 01 – Month 12

Objective 2: Industrial development in the port immediate hinterland
Workload in ports to the great extent depends on the demand of the hinterland. Weather they are the consumer goods and final products, or row materials for the industrial production, ports are the nodal points handling major flows of goods in regional and international trade. Today's globalisation of trade is pushing logistics sector to be more flexible and efficient, thus one of the main requirements when industries are choosing new development sites is that it is well connected to major transport corridors. Laying along the largest inland waterway corridor in Europe, ports in Serbia have natural preference for industrial development in their hinterland.

Implementation measures

Close collaboration with Ministry of Economy, Local self- governments and other Governmental institutions in charge for industrial development.
Ministry of Economy is responsible for the development of industrial strategy and policy of Serbia, as well as for its action plan. Next strategy will cover 10-year period, 2021-2030, and should consider ongoing and future projects in the transportation sector, especially the Rhine-Danube corridor and development of ports in Serbia. Unlike the role which river ports had until recently, being dedicated only to certain industries, they are now becoming widely important as logistic centres providing commercial services to variety of users and different industries. In this way they are enabling even smaller producers to deliver their goods on the global market efficiently.
Raising the awareness of local self-governments of Danube riparian municipalities is also important, and local industrial development policies should be updated and coordinated with the one on the country level.

Free Zones Administration has been established under the jurisdiction of the Ministry of Finance. PGA has close cooperation with Free Zone Administration and act jointly when there is interested company for the establishment of the new free zone or starting business in existing one. In line with the proclaimed policy, establishment of free zones in the immediate vicinity of ports is preferred.

Proposed responsible organisation(s):	Port Governance Agency
Proposed duration:	Continuous, in line with port development plans
Proposed time frame:	Month 01 – Month 96

Active role in the development of spatial planning documentation

PGA, together with the Ministry in charge for transport is contributing to the development of spatial planning documentation on different levels. State, Regional and City/Municipality documents are not changed often and correspond to the overall strategy for port development. Detailed planning documents for the areas where ports are located either are missing, or are outdated. Having in mind today's fast changing industry, and that some of the facilities planned 20, 30, or even 10 years ago are not necessary any longer and ports have different needs, plans have to be re-elaborated and synchronized with the new demand of the industry. Through the process of determination of port areas PGA has identified missing and outdated plans and pointed that out to the local self-governances. Elaboration of detailed plans for certain number of ports is under way, as it is necessary for the creation of further development plans and technical documentation.

Detailed planning documents usually elaborate port area together with the industrial (or free) zone in the port hinterland.

Proposed responsible organisation(s):	Port Governance Agency Ministry of Construction, Traffic and Infrastructure , Local Self Governances,
Proposed duration:	Continuous, in line with port development plans
Proposed time frame:	Month 01 – Month 96

Joint promotion activities

Use every opportunity to promote industrial development in the port hinterland, jointly with local and national authorities. Participate on conferences, fairs and other events, where port promotion can create added value to the industrial development capacities of the certain area or countrywide.

Proposed responsible organisation(s):	Port Governance Agency Ministry of Construction, Traffic and Infrastructure, Ministry of Economy, Free Zone Administration, Local Self Governances
Proposed duration:	Continuous
Proposed time frame:	Month 01 – Month 96

Objective 3: Become substantial part of the logistics chain

Nowadays, role of inland waterway ports has changed significantly. They are not dedicated only to specific industries any more, but are open to the variety of users, from production and trading to the shipping and logistic companies. In order to be recognised as main nodal points of the logistic chain, ports need to be more "visible" to shippers and logistic service providers. Beside the fact that they have to be part of the global transport network and to be promoted as part of it, ports also need to be included in integrated IT platforms used in multimodal transport chains. Goal is to enable fast and efficient administrative procedures, follow up on the status of the cargo at every moment, to provide alternative transport routes and applicable costs.

Implementation measures

Include more ports in core/comprehensive TEN-T network

Serbia has 12 ports open for international traffic, nine on the river Danube, two on the river Sava and one on the river Tisa. Only ports in Belgrade and Novi Sad are part of the core TEN-T network. Having in mind the geographical coverage, commercial importance and the fact that some of these ports have annual transhipment volumes of more than 1 mil tons of different cargo, the goal is to include at least two or three more ports in the core or comprehensive TEN-T network, on the occasion of the next extension of the network. Being part of the TEN-T network would encourage new investments in the infrastructure, access rail and rods, modernisation of port operations as well as industrial development of the port hinterland.

Proposed responsible organisation(s):	Ministry of Construction, Traffic and Infrastructure, Port Governance Agency
Proposed duration:	For example: 60 months
Proposed time frame:	Month 01 – Month 60

Develop user friendly tools for multimodal transportation planning (logistics platform)

Through the different projects and pilot operations various information technology tools have been tested and implemented in port management and operations. More and more functionalities of the River Information Services are being developed and deployed, enabling voyage planning, safer navigation and traffic monitoring. Structure and Pilot operations of three modules of the Port Community System have been developed and deployed during the Daphne project. These modules are covering ship and cargo related activities in ports relaying on the AIS data and user inputs, but have also foreseen some other activities in the port.

At the same time different platforms have been developed for the purpose of transport planning and monitoring of other transport modes. Following the development of the multimodal transport chain, in due time many of these functionalities should integrate in single logistics platform. Beside transport planning from door to door and anticipation of total costs, this user-friendly tool should suggest alternative routes and links in case of congestion, as well as expected transit times.

Proposed responsible organisation(s):	Port Governance Agency, Port Opertors, Shipping Companies, other interested parties
Proposed duration:	18 months
Proposed time frame:	Month 25 – Month 42

Objective 4: Human resource development

Alongside the improvement of the connectivity and accessibility of ports, construction of new infrastructure and application of new technologies, it is necessary to develop sufficient human recourses.

Implementation measures

Establish continuous education, from top and middle management to dockworkers and equipment operators

Changed role of ports and multimodal transport segment expansion, requires different port management approach and raised awareness on the importance of the global trade. Not only on the management level of the port operator, but also the port authority, border police, customs and other authorities in charge for safe and efficient operations of ports. Attending different international conferences and other thematic events and workshops should be among priorities of the top management. Correspondent continuous training needs to be arranged for the middle management as well.

Even though daily work routine makes good practice, safety and security procedures are of great importance for safe and efficient performance of port operations. Occasional trainings, especially with dockworkers and equipment operators, are also important and are keeping stuff updated with the company/authority safety and security policy.

Proposed responsible organisation(s):	Port Governance Agency
Proposed duration:	Continuous
Proposed time frame:	Month 13 onward

Organizing courses and trainings for the implementation and use of new technology and IT

Beside the process of digitalisation of port administration and border/custom procedures, significant time saving could be reached with the increased productivity of port operations. Major technology improvements are usually very expensive (change of cranes, heavy equipment etc.), but in the long this can make a difference in ability to provide services of higher quality and serve more clients. In addition to equipment performance, benefits could be derived from the same machinery with improved tools, work procedures and even maintenance schedule (i.e. predictive model for tracking the reliability of equipment parts to avoid unexpected stops of operations).

Appropriate trainings for the staff should follow the introduction and implementation of new technologies.

Proposed responsible organisation(s):	Port Operators
Proposed duration:	Continuous
Proposed time frame:	Month 13 – Month 96

Share good practice with other ports (from the network and external)
Traditionally, inside one region ports are competition to each other. However, the world trade is significantly growing together with the transport sector market. In order to follow these trends and strengthen the position of inland ports in the transport chain, transfer of know-how between ports is very much encouraged. Conferences, common projects and different events are lately used for building strategic partnership not only between port authorities, but also between port operators, logistic service providers and other port users. Knowledge and experience sharing between ports are valuable part of these collaborations. Establishment of DPN is an example of partnership based on these values. Eventually this cooperation will lead to the increased attractiveness of ports and bring more cargo on inland waterways.

Proposed responsible organisation(s):	DPN, Port Authorities, Port Operators
Proposed duration:	Continuous
Proposed time frame:	Month 01 onward

Objective 5: Development of the new infrastructure and redesign of the old infrastructure in ports
After the privatisation of port operations companies and later port sector reform, all ownership issues regarding the port land, infrastructure and superstructure are finally cleared. In line with the law, port land and infrastructure are the property of the state, with several exceptions for the part of the port infrastructure owned by the operators (acquisition through the privatisation process before the reform). Further development of ports and their inclusion in the transport network, requires more investments in public infrastructure which will enable increase of port capacities, smooth and efficient port operations, safe and reliable public services.

<u>Implementation measures</u>

Assess founding possibilities
At the moment, value of major IWT projects in Serbia is more than 200 mil euro. They are financed partly from state budget, partly from EIB loan and partly from WBIF. Also, some projects are financed from IPA. Even though Serbia is not EU member state, 40 % contribution for the reconstruction of the Iron Gate I lock will be received from CEF.

After a long period, first larger investment in port sector is the construction of the infrastructure for the Terminal for general and dry cargo in the port of Smederevo. Project value is estimated to 47 mil euro and will be financed from the EIB loan (50%) and the state budget (50%). Feasibility study with preliminary design has been completed and design for construction permit is under preparation. Construction works are planned to start in

September 2019 after the completion of the tendering procedure, and to be completed by December 2021. Alongside the building of the port infrastructure, railway access to the port area and link with national railway network are under construction. Once these infrastructure works are completed, tender for the concession of the Terminal will be launched. Beside the service providing tenderer will be responsible for the construction of the superstructure (estimated value 46 mil euro).

New port of Belgrade is probably the most important port project. As a Core network port it should contribute to the connectivity of the whole region through the Rhine-Danube corridor and with other TEN-T corridors. Beside the dry cargo terminal and general cargo terminal, port will have specialised container and RO-RO terminal, as well as oil terminal together with the LNG terminal. Total value of the project is 190 mil euro, out of which value of the port infrastructure works is approximately 90 mil euro. Construction of the port infrastructure will be financed partly from EIB and EBRD loans and partly from the state budget and WBIF. Spatial planning documentation, together with the EIA study is under preparation. Financing of the Feasibility Study with Conceptual Design is secured through WBIF grant of 800.000 euro, and tendering procedure is expected to be launched in the second quarter of 2019. Construction works are expected to start by mid-2021, and to be completed by the end of 2023. Concessioner(s) for the construction of the port superstructure and providing port services will be elected through the tendering procedure.

Apart from these two port projects, there is a possibility for additional investment in Port of Sremska Mitrovica on the river Sava. However, World Bank has started, in cooperation with European Commission, project of the rehabilitation of Sava/Drina river basin. Estimated value of the construction of the new infrastructure is 20 mil euro. Tender for the preparation of Feasibility Study with Conceptual Design has been launched and PGA has secured the financing for the technical documentation.

Proposed responsible organisation(s):	Ministry of Construction, Traffic and Infrastructure, Port Governance Agency
Proposed duration:	60 months
Proposed time frame:	Month 01 – Month 60

Promote PPPs – Port Concessions

Apparently, majority of infrastructure in other ports will have to be (re)constructed through the alternative financial models. Legal framework has been prepared, since the Law on port and navigation on inland waters has been harmonised with the Law on PPPs and Concessions. Beside the investments in port superstructure, one of major requirements for the successful tenderer for the privatisation of the Port of Novi Sad (the last state owned port operator) was investment in redesign of the port quay wall. Namely, outdated and inefficient sloped quay should be replaced with the vertical quay wall.

In other ports, the situation with existing infrastructure is similar. Port operators are aware that investments in the improvement of the infrastructure will enable higher quality of port services, which they consider important when competing for the market share.

Same goes for the financing of the construction of new terminals in existing ports. After the elaboration of the development project and its sustainability, and later preparation of technical documentation, investments can be provided through Concession model.

Proposed responsible organisation(s):	Port Governance Agency
Proposed duration:	60 months
Proposed time frame:	Month 01 – Month 60

Prepare technical documentation

In order to have projects ready for financing, whether through different funds, loans, state budget or PPP, technical documentation needs to be prepared.

As per above mentioned, these activities also can be financed from different sources. For large scale projects documentation is usually financed from the same source which will be used for a part or the whole of the project.

On the other hand, for PPP project public part is usually stepping forward with the preparation of the documentation.

In its work plan and financial plan for the 2019, PGA has anticipated two public procurements for technical documentation, for expansion of the Port in Sremska Mitrovica and Dry bulk terminal for the Port of Belgrade (sand, gravel and stone aggregates).

Proposed responsible organisation(s):	Port Governance Agency
Proposed duration:	60 months
Proposed time frame:	Month 01 – Month 60

Objective 6: Sustainable investments in port superstructure

In line with the proclaimed strategy and legal framework, construction of the port infrastructure is/will be financed from the public sources (state). These investments are usually made for the long term, and they are essential investment in the initial phase of port development. On the other hand, investments in port superstructure can be made through the award of concessions. If awarded as separate concession for each terminal and/or service, investments could be divided between several operators. Depending on the business plan, private parties can make these investments through the phases and in line with the market demand. Considering the unstable market of port services and still unreliable navigable conditions of the river Danube, investments made in this manner are more flexible and sustainable,

<u>Implementation measures</u>

Introduce new technologies

Technology development is usually referred to the acquisition of the new equipment and tools. These measures are typically expensive, and very much depend on the economy of scale. If the market requirement and/or potential flow of goods in the port hinterland correspond to the need for the new crane, reach stacker, forklift, pneumatic equipment etc, port operator

should have fast respond. However, higher productivity and lower operational costs could be also achieved by implementing the new knowledge, skills, techniques and organisational upgrade of the work processes.

Proposed responsible organisation(s):	Port Operators
Proposed duration:	Continuous
Proposed time frame:	Month 01 – Month 96

Construction of necessary (missing) port storage facilities

Through the gap analysis, it was concluded that some storage facilities are missing in ports of the Republic of Serbia. This is especially notable in Vojvodina region. Agricultural products are major type of goods loaded in Vojvodina's ports. Even though there are silos in several ports, most of the loading is being done directly from the truck over the ramp. This procedure has lowest costs for the operator, but it is the least wanted for the client. Beside the fact that this loading technology is harming the goods ("breaking" the seeds), it makes seasonal congestions in ports. Missing silo capacity does force owners to sell the goods when they can, not when the price is highest.

Therefore, development plans of ports in Novi Sad, Bačka Planaka and Bogojevo should consider construction of additional storage facilities. Ongoing privatisation process of the Port of Novi Sad is considering the investment of the future operator in the port superstructure amount of 14 mil euro. Value of the superstructure investments in construction of the new terminal in the Port of Smederevo will be approximately 43 mil euro. Estimated total value of the construction of the new port of Belgrade will be 190 mil euro, out of which 100 mil is the value of superstructure.

Proposed responsible organisation(s):	Port Operators
Proposed duration:	60 months
Proposed time frame:	Month 01 – Month 60

Objective 7: Improvement of multimodality

By its nature, ports are multimodal. They are designed to connect at least two modes of transport. But most of them developed differently and in line with the needs of the industry in the narrow hinterland. In order to reach their full multimodal potential, ports need good connection with the TEN-T network corridors and they need to be well equipped to deal with all sorts of cargo, especially with multimodal units.

<u>Implementation measures</u>

Construction of missing port access railway/roads

Majority of ports in the Republic of Serbia is connected with national rail network, and all of them have good connection with national road network. Some of them, like Port of Novi Sad, are positioned in the vicinity of the road/rail corridor X. New port of Belgrade will also have

direct connection with the road/rail corridor X. Port of Smederevo was for a long time without the rail connection. Ongoing project of the construction of railway link from the Port of Smederevo with the railway track Mala Krsna – Smederevo, is expected to be completed by June 2019. Value of the project is 9,5 mil euro and financing is secured from the budget of the Republic of Serbia.

Due to bad or complete absence of maintenance, some of port rail connections are of very low capacity. In order to support raising level of industrialisation, Republic of Serbia is constantly investing in transport sector, mainly in road/rail corridor X, but also in reconstruction of the main railway connections. Rehabilitation of the Nis-Zaječar railway is of great importance for the port of Prahovo as it will strengthen the connection of the port with the corridor X.
However, some ports, like Bogojevo or Bačka Palanka are still missing the railway connection.

Proposed responsible organisation(s):	Ministry of Construction, Traffic and Infrastructure, Port Governance Agency
Proposed duration:	60 months
Proposed time frame:	Month 01 – Month 60

Purchase of the necessary equipment

River ports are mostly equipped as multipurpose terminals. It takes large throughput of certain type of goods in order to divide port by specialised terminals, and stay sustainable in terms of costs. However, most of ports do purchase necessary parts of the equipment to be able to deal with multimodal units. At the start, these aren't large investments and usually are tools for the existing cranes or forklifts, if they are of sufficient capacity (spreaders and similar tools). Depending of the market requirements, part of the yard will be dedicated to the storage facility and supporting operations. Maintenance of these tools should be also arranged in due time, as it could significantly affect the smooth operations of the multimodal transport chain.

Proposed responsible organisation(s):	Port Operators
Proposed duration:	Continuous
Proposed time frame:	Month 01 – Month 96

7.6 Romania

7.6.1 Mission

The mission[20] of the Ministry of Transport of Romania is:

"*To develop an integrated transport system that effectively and equitably serves the people and economy while protecting the environment*."

Specifically, for ports, the port administrations having a corporate management, established their mission as follows:

Compania Nationala Administratia Porturilor Dunarii Fluviale S.A. (APDF) has the mission: "*To provide a network for the access at the Danube river by developing a high quality TEN-T port infrastructure in Romania in optimal economic conditions".*

Compania Naţională "ADMINISTRAŢIA PORTURILOR DUNĂRII MARITIME" SA (CN APDM SA), acting as a port authority for ports in the "maritime section" of the Danube has the mission:

"To develop and promote ports in the maritime sector of the Danube, to integrate them into river, sea, road and rail transport routes, to promote river-maritime trade through providing competitive port services that respect the community and the environment."

Mission of the NC "Maritime Ports Administration" SA Constanta (MPAC), having the role of port authority for the Romanian ports of Constanta, Midia and Mangalia:

"To provide quality and competitive services to the ports customers, to offer a developed transport infrastructure, as well as security, safety and environmental port conditions, thus encouraging the cargo traffic and transforming the Port of Constanta into an important transit centre - by offering the shortest transport alternative to the centre of Europe and becoming a regional distribution centre - the leader - for its hinterland."

Its core values are efficiency, safety & security, sustainability, integrity, reliability and professional excellency.

7.6.2 Vision

The strategic vision for the Romanian ports is defined in the General Transport Master Plan (GD no 666/2016) and is linked to a basic network of ports, called *The Primary Economic Network:*

[20] Report on Strategic Planning, elaborated by the Word Bank in 2012 and General Transport Master Plan for Romania – GD no. 666/2016).

"Ports of the Primary Economic Network will strategically serve Romania with secure infrastructure, modern and efficient logistic equipment and practices."

These ports were chosen based on specific criteria such as their inclusion on TEN-T network, location and size, current and potential operation of the goods.

Figure 7: Ports of the Romanian „Primary Economic Network"

(Source: General Transport Master Plan for Romania)

The vison will be achieved through:

- Improvement of the conditions for navigation on the Danube;
- Improvement of the road and rail links to the Danube, in order to reduce costs and travel time;
- Removing the administrative barriers for operational efficiency;
- Better coordination at the Government level and investments in infrastructure;
- Increasing the volumes of cargo transported on the environmentally – friendly and sustainable transport means;
- Efficient utilization of ports and their facilities;
- Increasing the use of multimodal transport.

The Port of Constanta has the specific ways to realize, as follows:

- Ensuring the efficient use and development of the public infrastructure;
- Providing the best access conditions to/from the administrated ports;
- Ensuring a healthy investment climate;
- Attracting international logistics chains;
- Promoting competitive prices, offering quality services to all its clients and creating a safe and secure environment to attract a bigger goods & passengers traffic;
- Building new facilities, generating the optimization of the port infrastructure and the intermodal links with the hinterland and fulfilling its role as Europe's Eastern gate;
- Promoting Romania, building economic relations with other countries, interacting and consolidating Romania's position in the hinterland.

The ports on Maritime Danube (APDM) have the specific ways to realize, as follows:

- Ensuring the functionality of shipping infrastructure by repairing and maintenance activities that lead at least to maintain minimum technical characteristics;
- The realization of investments using APDM resources and/or attracted resources in view to modernize the existing infrastructure and realization of new port infrastructure;
- Providing adequate and competitive port services, respecting legal provisions and the principle of equal treatment and non-discrimination;
- Promotion of ports located on the maritime Danube sector and their integration into the transportation routes by river, sea, rail and national and international road;
- Optimizing the consumption of material and financial resources, in accordance with the activities and services offered to clients;
- Maintaining financial balance through a proper budgetary control;
- Implementation of effective management practices in the field of human resources management within the company, by improving the professional competencies and motivating the employees of the company, ensuring a correct and pertinent operational performance assessment system;
- Reducing the negative environmental impacts caused by river transport activities and implementation specific measures aimed to improve the quality, environment, safety and health aspects of work.

The ports on River Danube ("fluvial" section – APDF) have their own specific ways to realize the vision, as follows:

- Maintenance and modernization of port infrastructure;
- Providing adequate and competitive services, respecting legal provisions and the principle of equal treatment and non-discrimination;
- Promotion of ports located on the river Danube sector and their integration into multimodal transportation routes;

- Maintaining financial balance through a proper budgetary control;
- Implementation of effective management practices in the field of human resources management within the company;
- Reducing the negative environmental impacts caused by river transport activities and implementation specific measures aimed to improve the quality, environment, safety and health aspects of work.

7.6.3 Objectives and measures

On the basis of the cumulative SWOT analysis (Annex I) of the port industry in Romania, as well as the methodology described in Chapter 7.1, Table 22 demonstrates various strategies (strategic objectives) of the Romanian port industry.

Table 22: Strategic development objectives for port industry in Romania

	Opportunities (external, positive) O1 Port location on the Silk Road - Europe - Asia Freight Route O2 Location on a major European transport corridor O3 Existence of European funds for the development of transport infrastructure O4 Regional European policies regarding the Danube and Black Sea O5 Exploitation of the opportunities for cooperation with the port of Constanta	**Threats** (external, negative) T1 High delays in the development of the road infrastructure in Romania T2 Insufficient attractiveness level to invest in Romania T3 Additional costs generated by the transit of the Danube-Black Sea Canal T4 Low levels of Danube waters during periods of drought T5 Navigation restrictions on the Danube during the periods with negative temperatures T6 Low predictability legal and economic framework T7 Decline in industrial production on the region T8 Critical conditions of navigation on the Lower Danube, and on the River Danube T9 Competition with other ports
Strengths (internal, positive) S1 The use of corporatized port management model, which allows for development in accordance with market requirements	**Strength-Opportunity strategies** *Which of the port industry strengths can be used to maximize the opportunities that were identified?* S2S10S12S13O1: attracting road and rail freight traffic from the Asia-Europe route to the Danube	**Strength-Threat strategies** *How can the port industry's strengths be used to minimize the identified threats?* S4T1: improving navigability on BG/RO common sector

S2 Diverse connections with hinterland area (road, rail) S3 The availability of a wide range of ship and freight services S4 An active member in international and European organisations S5 Conditions for the safe operations of ships S6 The existence of modern waste reception facilities S7 Developing partnerships between port operators and the local authorities for port development S8 Port development projects in progress S9 Maritime and river ports S10 Rail connection: both European and Russian standard S11 Strategic position at the Eastern border of the EU S12 Located on the Pan-European Corridor VII Rhin – Main – Danube waterway, of the TEN-T network plant S13 Existence of Free Zone S14 Proactive management for promoting the development projects and applying the principle of partnership at the Port Community level	ports (Pan-European Corridor VII/TEN-T) S4S9S12S13O1: attracting maritime cargo traffic from the Asia-Europe route to the Danube maritime ports (Pan-European Corridor VII/TEN-T) S14O3: accessing the European funds for the development of port infrastructure S11O4: enhance the value of the strategic position at the Eastern border of the EU within regional European policies (EUSDR etc.) S12O5:increasing container transshipment volume from/to Constanța port	S1T2: port strategy development in accordance with market requirements S12T3: joint promotion of inland waterway transport S1T5: HR strategy
Weaknesses (internal, negative) W1 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 W2 The lack of a coherent port community, capable to answer	**Weakness-Opportunity strategies** *Which actions can be taken to minimize the port industry's weaknesses using the opportunities that were identified?* W1O4: Implementation of IT systems W2O4: implementation of information exchange platforms (eg. DPN) W4O3: improving port infrastructure	**Weakness-Threat strategies** *How can the port industry's weaknesses be minimized in order to avoid the threats?* W8T3: Improving multimodality

promptly to the market request W3 The lack of logistics centres in the port area W4 The port infrastructure requires significant development investments W5 Lack of a masterplan for the port development W6 Limitations on conditions of navigation in the common sector Romanian-Bulgarian at certain times of the year W7 Limited supply of logistics services W8 Insufficient connections to hinterland W9 APDM does not have access to the RoRIS system W10 Insufficient dredging system for keeping water depth in port	W5O4: Master Plan elaboration	

(Source: MT, ILR, APDM, MPAC)

Below table summarizes the strategies (strategic objectives) and their corresponding development measures necessary to reach the objectives and implement the agreed strategy.

Table 23: Strategic objectives and necessary development measures for Romanian ports

Country	Strategic objectives	Necessary development measures
RO	Attracting road and rail freight traffic from the Asia-Europe route to the Danube ports (Pan-European Corridor VII/TEN-T)	• Developing cooperation with international multimodal transport operators in the context of international agreements on large combined transport lines; • Multimodality investments in ports; • Cooperation with western port authorities and development of Danube ports logistics system providing multimodal transhipment information; • Development of port infrastructure and superstructure

Country	Strategic objectives	Necessary development measures
	Attracting maritime cargo traffic from the Asia-Europe route to the Danube maritime ports (Pan-European Corridor VII/TEN-T)	• Joint promotion within the Black Sea international organizations (e.g. BSEC - Black Sea Economic Cooperation); • Investing in transhipment logistics; • Participation in EU Integrated Maritime Policy projects;
	Accessing the European funds for the development of port infrastructure	• Implementation of projects included in the master plan, in line with port community statements and market requirements • Strong cooperation between beneficiaries, government bodies, managing authorities etc.
	Enhance the value of the strategic position at the Eastern border of the EU within regional European policies (EUSDR etc.)	• Involvement in trans-border cooperation projects • Maximize the potential of the EU Danube Region Strategy
	Increasing container transhipment volume from/to Constanta port	• Constanta port joint promotion • Development of containers port facilities
	Improving navigability on BG/RO common sector	• Joint lobbying and cooperation with both government bodies and European organization • Allocation of the necessary budgets for the maintenance by Bulgaria and Romania • Implementation of projects for assuring the good conditions for navigation on long term
	Port strategy development in accordance with market requirements	• Enhance the value of corporatized port management model
	Joint promotion of inland waterway transport	• Joint promotion of TEN T Corridors and IWT transport including ports facilities
	HR strategy	• Elaboration/implementation of training programmes/courses • HR strategy as part of the contractual obligations to concession to port operators • Identification of new competencies generated by the market development and delivering of training able to provide/ develop such competencies
	Implementation of IT systems	• Proactive in EU digitalization policies and implementing multimodal IT Systems

Country	Strategic objectives	Necessary development measures
	Implementation of information exchange platforms (e.g. DPN)	• Coordination and cooperation between stakeholders guided by regional European policies whose measures are supported from the resources already available according to an integrated approach
	Improving port infrastructure	• Accessing the European funds for the development of port infrastructure
	Master Plan elaboration	• Ports master planning taking also into account the overall guidance specifications provided by the regional European policies
	Improving multimodality	• Multimodality investments connecting the hinterland

(Source: MT, ILR, APDM, MPAC)

Objective 1: Attracting road and rail freight traffic from the Asia-Europe route to the Danube ports (Pan-European Corridor VII/TEN-T)

Romania is situated at the East boarder of the European Union and it is considered as the EU Eastern Gateway. The geographical position of the country represents an opportunity to attract freight traffic from the landlocked countries situated in Caucasus area, bat also traffic from the Far East countries. In the last years, Romania has intensified its political dialogue with the states of the Caucasus, Central Asia and South Asia. A priority in the relations with the states of Central Asia is to promote transport corridors, both corridors linking Central Asia - Caspian Sea - South Caucasus - Black Sea and Central Europe through Romania, using primarily the facilities provided by the Romanian seaports of Constanta, Midia, Mangalia and Galati, which although is a river port, it allows the access of ships with a tonnage up to 25,000 dwt (deadweight tonnage) and has rail infrastructure standard gauge 1,435 mm and broad gauge 1,520 mm.

Implementation measures

The objective can be achieved by constant and focused dialogue for developing cooperation between public entities and international multimodal transport operators in the context of international agreements on large combined transport lines. In the dialogue will be involved the port authorities as well as the private operators in order to find the effective solutions for setting up the connections for the cargo. The cargo coming from Asia – Europe routes will not stop only in Romanian ports and it is intended to be transported further to the Central Europe. So, it must be established a cooperation with western port authorities and must be developed the Danube ports logistics system in order to provide multimodal transhipment information in real time. Also, this cooperation and the platform containing multimodal transhipment

information it is necessary also for cargo going back from Europe, Danube ports, to Asia routs. Advancing in these dialogues, further investments in port infrastructure and superstructure could be necessary. For these investments it is necessary the involvement of the state, port authorities, private operators and providing financing.

Proposed responsible organisation(s):	Ministry of Transport, Ministry of Economy, MPAC, Constanta Port Business Association - private operators, Railway companies CFR
Proposed duration:	48 months
Proposed time frame:	Month 13 – Month 61

Objective 2: Attracting maritime cargo traffic from Asia – Europe route to Danube maritime ports

This objective is in line with the first one and puts more emphasis on the available railways capacities of the port of Galaţi and available capacities of the ports of Braila and Tulcea. The port of Constanta has demonstrated its competitive advantages resulting from the connection with the Danube, offering a shorter, clean, cheaper transportation alternative and a reduced transit time for goods from Central Asia, the Caucasus Region and the Far East, having as destination the states of Central and Eastern Europe, representing a true "gateway to Europe". The maritime Danube ports lost during the last two decades an important share of traffic due to the political and economic changes that happened in the Eastern Europe. Attracting cargo traffic from Asia – Europe route is an important objective for the ports administrated by the Maritime Danube Ports Administration (APDM).

Implementation measures

The objective can be achieved by a joint promotion of the Danube maritime ports within the Black Sea international organizations, as BSEC - Black Sea Economic Cooperation. The Black Sea Economic Cooperation (BSEC) came into existence as a unique and promising model of multilateral political and economic initiative with the signing of the Istanbul Summit Declaration and the Bosporus Statement by the Heads of State and Government of the countries in the region, on 25 June 1992. BSEC has a wide area of cooperation, including transport and trade and economic development.

Investing in transhipment logistics will definitively contribute to this objective and already started in the port of Galați, implementing the project *Galati multimodal platform*, stage I financed from CEF.

Participation in the EU Integrated Maritime Policy projects it is another measure identified by APDM, which will follow the latest developments on this issue, in relation with its objective and mission. The integrated maritime policy seeks to provide a more coherent approach to maritime issues, with increased coordination between different policy areas. One of the focuses is on the “blue growth” (economic growth based on different maritime sectors). Blue Growth is the long term strategy to support sustainable growth in the marine and maritime sectors as a whole. Over the last 5 years, the Commission has ordered a series of studies to

identify areas for enhanced cooperation at sea-basin level and to explore the potential for maritime clusters.

Proposed responsible organisation(s):	Ministry of Transport, Ministry of Economy, APDM, Ship Owners and Port Operators Association - private operators, Railway companies CFR
Proposed duration:	48 months
Proposed time frame:	Month 13 – Month 61

Objective 3: Accessing the European funds for the development of port infrastructure

The infrastructure of the Romanian Danube ports is quite old, the operation is done at sloped quays in many cases and it is affected by the water levels. The programmes shaped at EU level represent a good opportunity to improve the situation and to modernise the port infrastructure in order to be more attractive for the economic operators. The budgets available at the ports administration are not enough for large investments.

Implementation measures

The objective can be achieved by the preparation and implementation of projects included in the master plan, in line with port community statements and market requirements. A strong cooperation between beneficiaries (port administration), government bodies (in terms of promoting the investments and getting approvals) and managing authorities is necessary.

Proposed responsible organisation(s):	Maritime Danube Ports Administration (APDM); River Danube Ports Administration (APDF), Navigable Canales Administration (ACN), Maritime Ports Administration (MPAC)
Proposed duration:	60 months
Proposed time frame:	Month 1 – Month 60

Objective 4: Enhance the values of the strategic position of the Eastern border of the EU within regional European policies (EUSDR, etc.)

Being at the border of EU, as well as having access to the sea, it is seen as a strength because the ports, especially the port of Constanta, represent a gateway for the entry/exist of cargo in/from the EU. So it is important for Romanian ports to promote their capabilities and to improve them as part of the regional European policies, like is the EU Strategy for the Danube Region (EUSDR). Setting up common procedures, common strategies, increasing cohesion in the region, sharing best practices will improve the performance of the ports.

Implementation measures

To achieve this objective, the measures identified are the trans-border cooperation projects and the potential of the EUSDR. A series of projects like Watermode and GIFT made possible a cooperation of ports and put the basis of new investments or areas to be more explored in

this fields. The macro-regional strategies are a quite new cooperation formula between states (EU and non-EU) and promote common actions and targets.

Proposed responsible organisation(s):	Danube Ports Network, Maritime Danube Ports Administration (APDM); River Danube Ports Administration (APDF), Navigable Canales Administration (ACN), Maritime Ports Administration (MPAC), Ministry of Transport, private port operators,
Proposed duration:	48 months
Proposed time frame:	Month 13 – Month 61

Objective 5: Increasing container transhipment volume from/to Constanta port

Container volumes transhipped is one indicator that classifies the ports worldwide but also in Europe. Increasing this indicator for the port of Constanta is a constant preoccupation and an important aspect of its business. There are already four terminals handling containers and some of the facilities were extended by the private operators. It is known that the containerization facilitates the movement of cargo, but in the same time to be costly efficient need large volumes to be transported / operated.

Implementation measures

The objective can be achieved by a joint promotion of the facilities within the port as well as the connections, a joint promotion of the port administration and the private operators. The development of containers port facilities is another measure that can contribute to the increase of the container transhipment volume. The port of Constanta has plans to develop the infrastructure for container terminals, but this will strongly depend on the market requirements.

Proposed responsible organisation(s):	Private container operators & MPAC
Proposed duration:	60 months
Proposed time frame:	Month 13 – Month 73

Objective 6: Improving navigability on BG / RO common sector

The Romanian – Bulgarian common sector of the Danube (470 km) is a difficult sector for navigation, because of the low water levels during dry seasons on some critical locations where the minimum recommended depths and widths on the fairway cannot be ensured. This situation affects mainly the traffic along the Danube as well as the cargo volumes operated within the ports. The problems of navigation on the Romanian-Bulgarian common sector were brought, by several transport companies, to the attention of the Romanian and Bulgarian authorities, but also to the attention of the Danube Commission and the European Commission.

Implementation measures

This objective can be achieved by **joint lobbying and cooperation with both government bodies and European organization, allocation of the necessary budgets for the**

maintenance by Bulgaria and Romania and by implementation of projects for assuring the good conditions for navigation on long term.

According to the provision of art. 3, from Convention regarding the regime of navigation on the Danube (Convention), signed in Belgrade on 18 August 1948 (ratified by Decree No 298/1948), riparian States have the obligation to maintain their Danube sections in navigable conditions and to carry out the necessary works to ensure and improve navigation conditions and not to hamper or hinder the navigation on the waterway. Considering that, in certain sections, the Danube is also border between two states, the Convention provides, in art. 39, that the execution of the works and the distribution of costs must be settled by agreement between those States.

In implementing the provisions of the Belgrade Convention, the Governments of Romania and Bulgaria have concluded on November 29, 1955, in Sofia, an Agreement on the maintenance and improvement of the fairway on the Romanian – Bulgarian common sector of the Danube (Agreement from 1955). In addition, according to the Agreement from 1955, the Romanian - Bulgarian Joint Commission for the maintenance and improvement of the fairway was established.

In addition, several meetings between the European Commission, Romanian and Bulgarian authorities took place in order to identify short, medium and long-term solutions.

Regarding the allocation of the necessary budgets for the maintenance, this is the permanent concern of the states involved. Since the Declaration on effective waterway infrastructure maintenance on the Danube and its navigable tributaries (Luxembourg, 7 June 2012) and the *Fairway Rehabilitation & Maintenance Master Plan for the Danube and its Navigable Tributaries*, currently the needs and the budgetary allocations are monitored by Priority Area 1a within the EUSDR through the National Action Plans, which are updated twice per year.

Implementation of projects for assuring the good conditions for navigation on a long term is carried out mainly through the Fast Danube project which is on-going with the objective of identifying the appropriate technical solutions to address the critical sectors.

Proposed responsible organisation(s):	River Administration of the Lower Danube (AFDJ - Romania), Executive Agency for Exploration and Maintenance of the Danube River (APPD – Bulgaria), Ministry of Transport of Romania, Ministry of Transport, Information Technology and Communication of Bulgaria
Proposed duration:	60 months
Proposed time frame:	Month 1 – Month 60

Objective 7: Port strategy development in accordance with market requirements

Port represents an area whereas different actors are performing activities related mainly to the cargo. Port development should define what competencies it needs to develop, in order to improve its competitiveness in regards to the hinterland and the different supply chains. Further, the competencies are based on capabilities, and these capabilities have an organisational rooting. The development of core competencies should be viewed from a port system level to include port authority and companies involved in the supply chains.

Implementation measures

The objective can be achieved by enhancing the **value of corporatized port management model.** Corporatized port management means that the port administration acts as a private company, although the government still retains ownership on the port infrastructure. A corporatized management means the setup of specific indicators and targets for a period of time. The targets should be in line with market requirements and all the resources should be aligned in order to fulfil them.

Proposed responsible organisation(s):	Maritime Danube Ports Administration (APDM); River Danube Ports Administration (APDF), Navigable Canales Administration (ACN), Maritime Ports Administration (MPAC)
Proposed duration:	12 months
Proposed time frame:	Month 1 – Month 12

Objective 8: Joint promotion of inland waterway transport

For a long period of time Danube ports were promoted and were developed individually. Starting with 2013, ports were included in multimodal corridors and, in this way, there is a more comprehensive vision on the necessity of their development. Danube ports cannot be developed without having into consideration the Danube fairway. The European Commission policies, including NAIADES, considers ports as part of inland waterway transport.

Implementation measures

The objectives can be achieved by a **joint promotion of TEN-T Corridors and IWT transport including ports facilities**. The transport operators are interested to find the most efficient way to deliver the goods to their customers. By a corridor approach, the operators can see all the developments at the level of a corridor. In the same time, a corridor approach can be a tool for the governments and the port authorities in order to take decisions for their further investments.

Proposed responsible organisation(s):	Ministry of Transport , DPN, Maritime Danube Ports Administration (APDM); River Danube Ports Administration (APDF), Navigable Canales Administration (ACN), Maritime Ports Administration (MPAC)
Proposed duration:	60 months
Proposed time frame:	Month 1 – Month 60

Objective 9: HR strategy

Ports should be seen as “socio-technical” systems because, in practice, operations in port terminals are carried out by a partnership between human beings and technology. This partnership, however, can only be successful if appropriate emphasis is given to human resource management and particularly the training component, an often over-looked area that can have a significant impact on port performance. Port operations presents some risks and the proper qualification of the personnel is needed at the level of port operators as well as the level of port administration. In addition, the technology for port operation is in evolution and human resources must keep up with these developments.

Implementation measures

The HR strategy at port level can be achieved by the **elaboration of specific training programs** dedicated to port personnel. Professional training is significantly important for a secure and efficient operation of ports. However currently there are no specific rules on the professional training of port workers. In this regard, one regulatory option might be considered. But there are general EU rules on health and safety of workers and compliance with those standards is extremely important and should be carefully monitored. It is also necessary to provide more flexible employment and social dialogue can and not least to improve the public image of ports.

As mentioned above, as there are specific EU rules on health and safety of workers, the HR strategy should be **part of the contractual obligations to concession to port operators**.

Taking into account the rapidly changing environment of technological innovation and of the increasingly sophisticated demand, the economic transition to market-oriented practices is neither easy nor smooth. Moreover, the required time for a gradual assimilation of transition and evolution to economic and social conscience is lacking. On the other hand, it should not be neglected the possible pressure which is not uncommon however, from various interested groups, often even justifiable, which is designed to protect the environment, ethics, traditions, culture. Identification of new competencies generated by the market development and delivering of training able to develop competencies is needed at the port level and should be part of the HR strategy.

Proposed responsible organisation(s):	Maritime Danube Ports Administration (APDM); River Danube Ports Administration (APDF), Navigable Canales Administration (ACN), Maritime Ports Administration (MPAC)
Proposed duration:	18 months
Proposed time frame:	Month 1 – Month 18

Objective 10: Implementation of IT systems

Port Community Systems (PCS) are electronic platforms that connects multiple systems operated by a variety of organizations within a port area. PCS is increasing port operation effectiveness because optimises and automates port and logistic processes through a single submission of data. In the same time connects transport and logistic chains. Key drivers for the establishment of Port Community Systems were, on the one hand, the need for a standardised communication platform in order to improve the systems in terms of punctuality, reliability or costs and, on the other hand, the need to increase competitive position among ports. PCSs have a long tradition in the Western Europe countries, but was not developed in the Eastern maritime ports and on the Danube River ports.

Other IT systems are already in place on the Danube as is the case of RIS and it is under development RIS at the corridors level.

Technology and innovation, such as the Internet of Things, are said to be a driving force behind smart port productivity. This type of technology, in the form of physical and IT infrastructure could be the best way to see benefits in a smart port environment.

Implementation measures

The objective can be achieved by **PCS development in ports**. For the implementation of such a system, the port administration should conduct a feasibility study in order to establish the economic operators involved, the model architecture and the resources.

Proposed responsible organisation(s):	Maritime Danube Ports Administration (APDM); River Danube Ports Administration (APDF), Navigable Canales Administration (ACN), Maritime Ports Administration (MPAC)
Proposed duration:	12 months
Proposed time frame:	Month 1 – Month 12

Digitalization in combination with the evolution and advancement of existing tools gives impetus for the shipping industry and related transport and supply chain infrastructure and creates an opportunity for development and innovation. This is an important issue on the EU agenda and the final goal will be probably the **implementation of multimodal ITSs and national management of ITSs**. So it is necessary that the port administration and the Government to be **proactive in EU digitalization policies**.

Proposed responsible organisation(s):	Maritime Danube Ports Administration (APDM); River Danube Ports Administration (APDF), Navigable Canales Administration (ACN), Maritime Ports Administration (MPAC)
Proposed duration:	36 months
Proposed time frame:	Month 13 – Month 49

Together with the digitalisation, the number of cyberattack cases rises. Targeted attacks, aimed at certain companies and organizations, are becoming commonplace and it can happen to the ports and IWT transport systems too. **Development of cybersecurity measures** is a permanent concern and will accompany the implementation of such systems, in order to protect the information that are gathered there.

Proposed responsible organisation(s):	Maritime Danube Ports Administration (APDM); River Danube Ports Administration (APDF), Navigable Canales Administration (ACN), Maritime Ports Administration (MPAC), Ministry of Interior
Proposed duration:	60 months
Proposed time frame:	Month 1 – Month 60

Objective 11: Implementation of information exchange platforms (e.g. DPN)

Development of information exchange platforms is in line with digitalization policies and become a tool for the working environments, including ports. Such platforms were developed for dissemination of information related to IWT projects in the Danube region (https://www.danube-navigation.eu/projects), for obtaining information related to ports (http://www.danubecommission.org/dc/en/danube-navigation/danube-ports-map/), for information related to financing programs (https://www.danube-region.eu/funding/private-

sector-2), for information related to water level and other information necessary for navigation (http://www.danubeportal.com/?pageid=waterlevel_water_level&display=no)

The Danube Ports Network (DPN) concept has emerged within the framework of the DAPhNe project in response to a real need for a unified, coordinated message of the Danube Region's inland and sea ports community in Europe and beyond. Danube Ports Network is a new actor in the Danube Region port governance system. With the support and collective effort of its partners, the Network shall become a long-term, sustainable structure contributing to good port governance and cooperation strengthening in the Danube Region.

Implementation measures

As the information exchange platforms represents a tools they shall be continuous developed and updated (maintained). The objective can be achieved through a **coordination and cooperation between stakeholders, guided by regional European policies whose measures are supported from the resources already available according to an integrated approach**.

Proposed responsible organisation(s):	Danube Ports Network, Maritime Danube Ports Administration (APDM); River Danube Ports Administration (APDF), Navigable Canales Administration (ACN), Maritime Ports Administration (MPAC)
Proposed duration:	60 months
Proposed time frame:	Month 1 – Month 60

Related to DPN, the objective was partially achieved by the creation of the bylaw, the website and the financing model, but the consolidation of the role of DPN and its related information exchanging platform shall continue with the involvement of DPN members.

Objective 12: Improving port infrastructure

Improving of port infrastructure is an obligation of the port administration and in the same time a necessity for the Danube ports. Port infrastructure in Romania is quite old, Danube river ports have mainly sloped quays that decrease port productivity, rails and roads within ports needs improvement. Improving of port infrastructure is considered that will attract cargo traffic as well as private investments within ports.

Implementation measures

The objective can be achieved mainly with **accessing the European funds for the development of port infrastructure**. The budgets of the port administration and sometimes the state budgets are far to cover the investments necessities. European programmes and funds are available for IWT and ports and in order to be accessed is needed a good preparation and the maturity of the infrastructure projects.

Proposed responsible organisation(s):	Maritime Danube Ports Administration (APDM); River Danube Ports Administration (APDF), Navigable Canales Administration (ACN), Maritime Ports Administration (MPAC)
Proposed duration:	60 months
Proposed time frame:	Month 1 – Month 60

Objective 13: Master Plan elaboration

A Master Plan is a document that establish future policies, goals, investments in a certain area and period, usually on a long term. Having in view the market requirements, it is recommended to update this strategic document at 5 – 10 years.

Implementation measures

In order to achieve the objective, the **ports master planning should take into account the overall guidance specifications provided by the regional European policies**, which usually changes at 10 years. Port master plan are frequently elaborated within the framework of wider port policy or port strategies or port strategic planning, encompassing a larger variety of aspects than a single port master plan.

Proposed responsible organisation(s):	Ministry of Transport, Maritime Danube Ports Administration (APDM); River Danube Ports Administration (APDF), Navigable Canales Administration (ACN), Maritime Ports Administration (MPAC)
Proposed duration:	12 months
Proposed time frame:	Month 49 – Month 60

Objective 14: Improving multimodality

Another important aspect of the port industry and, with extension, of the international cooperation is of multimodal transport systems, made the most of the transhipment hub at the junction of corridors. Railways and roads connections to the Danube ports are in poor condition in Romania. Development plans are included in the General Transport Master Plan and the plans shall be put in actions.

Implementation measures

The objective can be achieved by **investments in multimodality connecting the ports with their hinterland**. The port administration is in charge for developing the multimodality connections within the ports, while the development of railway and road infrastructure in the hinterland is the tasks of the railways / roads administration companies.

Proposed responsible organisation(s):	Maritime Danube Ports Administration (APDM); River Danube Ports Administration (APDF), Navigable Canales Administration (ACN), Maritime Ports Administration (MPAC), Railway Company CFR SA, National Company for Highways and Road Infrastructure
Proposed duration:	60 months
Proposed time frame:	Month 1 – Month 60

7.7 Bulgaria

7.7.1 Mission

The mission of Bulgarian Ports Infrastructure Company (BPICo.) is:

"To ensure the efficiency of the port infrastructure managed and the services provided by the Company, taking into account the balance of interests for the development of the national port system, the needs and expectations of customers, stakeholders and society as a whole."

The above mission is implied by the responsibilities set out in the Maritime spaces, inland waterways and ports in the Republic of Bulgaria Act and the Statutes of the Company. Achievement of this ambitious goal bears national importance and is constantly followed by preparation and fulfilment of programmes for construction, reconstruction, rehabilitation, maintenance, development and management of the infrastructure of public transport ports of national importance.

7.7.2 Vision

"Through appropriate business planning, in compliance with national and international regulatory requirements, and taking into account the available human and material resources, contribute to the effective and efficient development of the overall transport system of the Republic of Bulgaria."

Bulgarian inland ports are part of the national transport system. Their development is part of a wider national strategy. BPICo. has to adjust its plans and activities according to strategic decisions taken on national level.

7.7.3 Objectives and measures

On the basis of the cumulative SWOT analysis (Annex I) of the port industry in Bulgaria, as well as the methodology described in Chapter 7.1, Table 24 demonstrates various strategies (strategic objectives) of the Bulgarian port industry.

Table 24: Strategic objectives and necessary development measures for Bulgarian ports

Country	Strategic objectives	Necessary development measures
BG	1. Attract transit cargo by using the advantages of the BG transport system and location	• Marketing measures (promotion materials, TV commercials, conferences, meetings, active communication with target groups) taken by port operators; • Taking strategic decision on higher level – for cooperation between different types of transport, for effective logistic schemes;

Country	Strategic objectives	Necessary development measures
		• Active communication with port authorities for purposeful strategic efforts
	2. Improve and modernize port services	• Actions taken by the government to finish the process of concession of BG river ports; • Keeping concessions in force on good level of fulfilment; • Encourage port operators to introduce modernizations by implementing incentives and system for evaluation; • Feedback from clients;
	3. Identify the most needed, appropriate & cost effective modernization in ports	• Identification of modernization measures by collecting expert opinions from the qualified port personnel from each port; • Elaboration of financial, technical, marketing researches and forecasts;
	4. Keep highly qualified personnel within port companies (before and after concession procedures)	• To introduce/ improve HR measures in the contracts with concessionaires and state owned port operators with regard to personnel: more attractive measures for motivation and low staff turnover – social benefits, good working conditions. For highly qualified staff – higher payment conditions, constant vocational training
	5. Attract private investment in ports through successful concessions	• Actions taken by the government to finish the process of concession of BG river ports;
	6. Increase the share of intermodal transport	• By taking measures for improvement of the navigability of the Danube river; • Boosting national and international economies that generate intermodal cargo; • Working on higher level (government, intermodal organizations and companies) to stimulate intermodality;
	7. Improve port infrastructure in order to keep current cargo flow and attract new types of cargo/ new clients	• Actions taken by the government to finish the process of concession of BG river ports • Keeping concessions in force on good level of fulfilment • To follow quality oriented approach on port concessions

Country	Strategic objectives	Necessary development measures
		• Granting joint concessions by the state and municipalities to assure investment in projects of bigger scale
	8. Rise the role of the private sector through concession of ports that are not already granted	• Actions taken by the government to finish the process of concession of BG river ports
	9. Introduction of an integrated transport system to increase competitiveness	• To integrate the River information system (BulRIS) with existing and new information/ management systems in the field of railway and automobile transport, control bodies, etc.

(Source: BPICO)

It must be stressed that these objectives and measures are derived through the process of collection of information and analysis of the current status of the river port system in Bulgaria within the DAPhNE project and by the project team of BPICo. Most of them are not linked with deadlines and budgets, because they affect organizations and institutions out of the direct influence or competence of BPICo. Some of the objectives are already identified by the Government through strategies and policies. BPICo. does not aim at unique or "miracle" measures. Current analysis is intended to bring the most important issues at the attention to the interested parties.

Objective 1: Attract transit cargo by using the advantages of the BG transport system and location

As stated in Deliverable 6.1.1 Danube ports SWOT analysis, Bulgaria has a good geographical location on a crossroad between Western and South-eastern Europe, the Middle East and Asia.

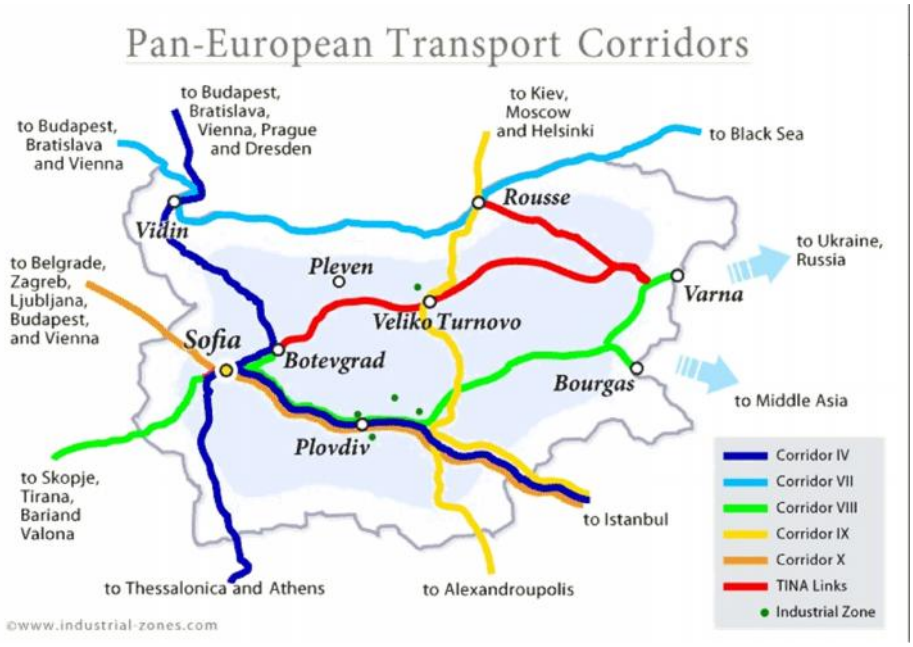

Figure 8: Pan-European Transport Corridors crossing the Republic of Bulgaria

Source: www.industrial-zones.com

Port terminals serve as convenient connections for import and export traffic. Currently, there is free capacity with regard to handling and storage of cargo in river ports. As the Bulgarian economy cannot generate significant trade flows, that could boost port development, it is reasonable, efforts to be concentrated on attracting transit cargo traffic. Thus, the cargo turnover will rise, bringing higher incomes directly for port operators and indirect benefits to the entire transport sector.

The above possibilities are included in the "Opportunities" part of the SWOT analysis in the integrated strategy for transport development up to 2030 - ***Opportunities for development of transit traffic along the direction of transport corridors crossing the country and providing good conditions for connecting Western and Central Europe with the Middle East, Western and Central Asia.*** Failing to attract transit traffic is identified as a threat by this SWOT analysis. On the other side, the transit traffic generated by cargo trucks through Bulgarian roads is very intense with high level of congestion and accidents. There is an ecologic and economic reason to divert cargo trucks from roads to combined rail – water transport.

Bulgaria's favourable geographic location by itself does not provide guarantees for the development of international transit transport. Substantial investments are required first for improving and maintenance of the existing infrastructure, and – to a lesser extend – for the construction of missing infrastructure components. In this aspect, the proper identification of priorities in the short, medium and long term is of a paramount importance in order to maximize expected benefits by efficiently utilizing the limited available funds and by taking into account the priorities of the EU and of the neighbouring states.[21]

Implementation measures

Marketing measures (promotion materials, TV commercials, conferences, meetings, active communication with target groups) taken by port operators;
Promoting the favourable geographical location of the country and its transport (including river) connections has to be a high priority. Port operators, which perform the every-day port activities – transhipment, storage, manoeuvring, technical and administrative services, etc. – should be involved in joint actions to offer their specific commercial conditions to potential clients. Currently there is not much public information on the efforts of port operators to develop their business, probably due to the commercial secret existing and the relatively conservative industrial sphere. Marketing measures would help river ports to "come out" to the public and declare their intentions to provide quality services. Spreading marketing materials and information on specialized events is a relatively low-cost method to attract new clients. This bottom-up approach could help institutions (such as ministries, administrations) spread more useful and focused information.

An example on how this measure could be achieved is to have a new organization – port union, which could be responsible for targeted marketing campaign, or to have this measure coordinated by the Ministry of transport, information technologies and communication. The budget needed depends on the type of promoting materials/ events. It could vary depending on how much the operators or the Ministry is ready to allocate for this purpose. Results of the focused campaign (for example after a year) could be reported either by marketing research or by the percentage of the increased cargo volume, if this is the case. Targeted potential clients could be asked why they have chosen to work/ not to work with the ports promoted. After that, further measures may be outlined. For example – if clients insist on having specialised storages – new ones could be built, if economic conditions on governmental level have to be clarified or changed – steps could be taken for amendment of the legislative frame, etc.

Proposed responsible organisation(s):	new organization structure – Port Union, MTITC
Proposed duration:	24 months
Proposed time frame:	2020- 2022

[21] Source: Strategy for the development of the transport system of the republic of Bulgaria until 2020

Taking strategic decision on higher level – for cooperation between different types of transport, for effective logistic schemes;

Ports do not exist separately. They are important part of logistic schemes and transport routes. In order to attract transit cargo, efforts have to be put in building an effective network from the starting point of the cargo transferred to its end receiver. That includes most often cooperation between rail, automobile and water transport players. Such cooperation could easily be reached if the government defines in a clear way which transport links are of highest importance. Furthermore, synchronization is needed between all modes of transport on national and international level in a competitive and effective way.

In the current case, strong support for Danube inland waterway transport is needed. Responsible actors for this measure should be the Ministry of transport, railway, port and automobile operators, cargo owners and forwarders, transport organizations. They have the ability to define the real needs and adequate measures. For instance, certain transit cargo flows could be identified immediately by forwarders and cargo owners. Any gaps and disadvantages have to be discussed with the transport ministry, ministry of economy, etc.

On the picture below, the ongoing projects under Operational Program Transport and Infrastructure are shown. That is the "image" of the real work, resulted from such strategic decisions on governmental level. The red lines represent road initiatives, green – railway development, plus intermodal terminals and the projects of BPICo. are marked with radar and communication towers. Strategic documents for the development of the Bulgarian transport infrastructure have already noted that:

- *"Large part of the **railway facilities** (bridges and tunnels) is at the end of the life cycle such as the routes Ruse - Varna. Much of the security, telecommunications and energy supply systems are outdated (put into operation in the period 1965-1985) and do not meet modern requirements for interoperability.*
- *Coverage of the country's territory with **motorways and first class roads is uneven**. The east - west direction is much better developed than the north - south direction, which is largely determined by the topography of the country.*
- *Most of the **Bulgarian ports** have been built in the beginning of the past century and their current technical condition is unsatisfactory. The main problems related to ports 'development are lack of investment for maintenance and backlog in development of port infrastructure in past periods, obsolete basic mechanical equipment and facilities for transshipment, poor condition of the piers.*
- *There is no national network of modern intermodal terminals meeting the needs of railway and inland waterway freight transport. Intermodal operators are not well equipped with specialized rolling stock and there are only a few direct operational/logistic intermodal connections.*[22]

[22] http://www.optransport.bg/upload/docs/OPTTI_ENG_17112014_verision_1.pdf

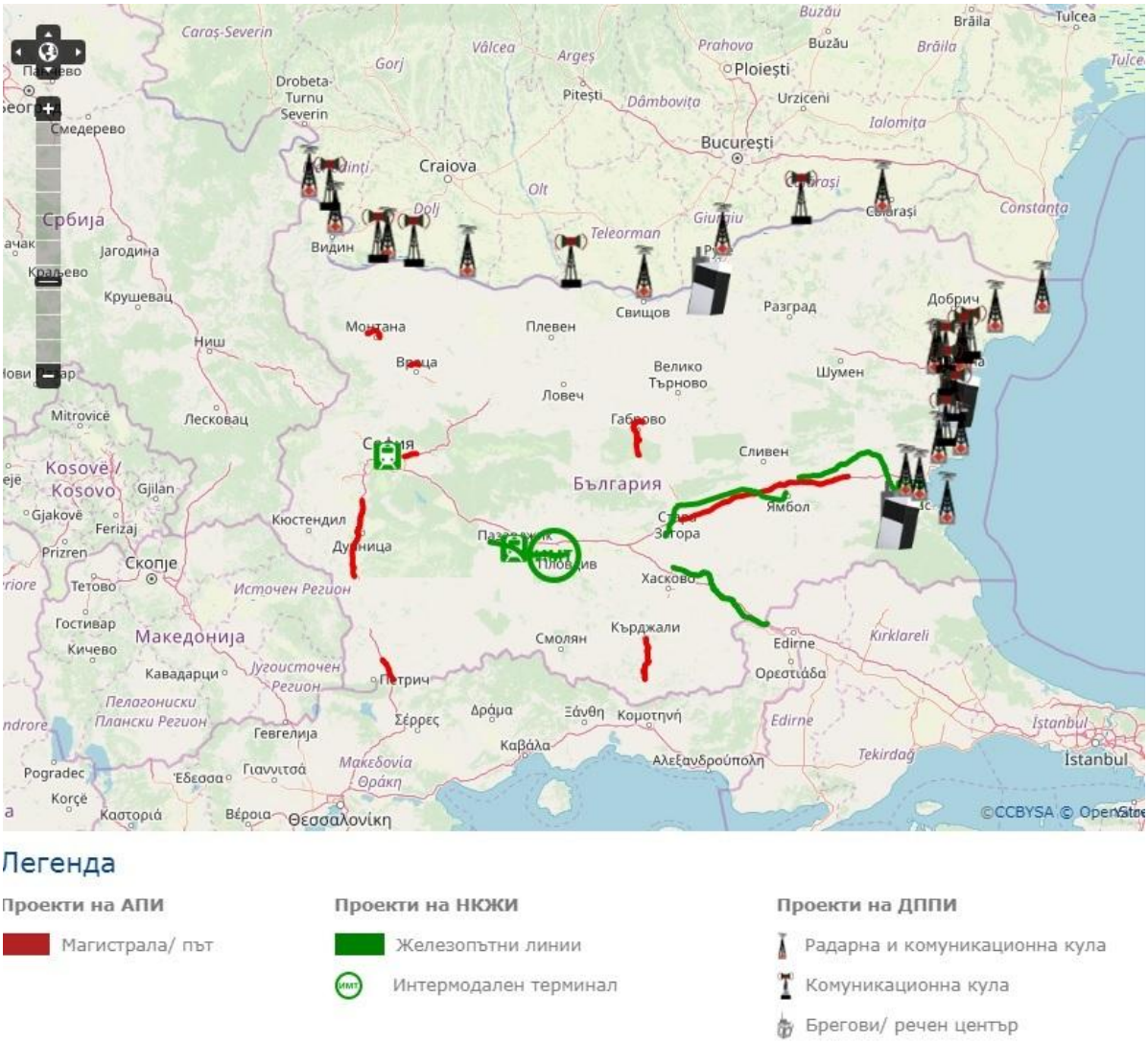

Figure 9: Transport infrastructure projects in Bulgaria

Source: http://maps.optransport.bg/

Further projects must be accomplished for development of the railway and road infrastructure of Northern Bulgaria. Also, improvement of the Danube fairway is expected to be implemented by the Executive agency for maintenance and development of the Danube river.

The planned measures are expected to address the following needs of the sector:

- Development of a network of terminals meeting the requirements for modern freight-transport services, aimed at ensuring of better coordination between individual modes of transport in relation to the intermodal services development, and establishment of reliable and fast railway connections between terminals. The needs assessment shows

a necessity for construction of terminals in Sofia, as well as in the South-East Planning Region, North-East Planning Region and North-West Planning Region.

- Development of intermodal connections between ports and railway network, with regard to the promotion of potential growth in trade and transit transportations,
- Expansion and development of storage areas at several freight terminals.

Regarding the timeframes, 2019 will be of crucial importance due to the fact that investment for the next planning period will be planned.

Proposed responsible organisation(s):	Responsible actors for this measure should be the Ministry of transport, railway, port and automobile operators, cargo owners and forwarders, transport organizations
Proposed duration:	permanent
Proposed time frame:	from 2020 on

Active communication with port authorities for purposeful strategic efforts

The role of port authorities is to check and ensure that all the necessary regulatory requirements are kept. BPICo. and port operators plan their investment in port infrastructure in advance. If there is a decision and a serious well-grounded intention to attract transit cargo, such plans for development could include pre-defined measures. Such measures could be on the basis of the cargo volume and type expected – whether food products, dangerous goods, or other. Except the infrastructure, port operators could easily plan their management, HR and marketing policies.

Objective 2: Improve and modernize port services

By port services BPICo. means the complex combination between vessel traffic management, formal border and customs procedures, cargo handling and storage in ports, and communication between stakeholders within the port area. Improving port service will respond to the clients' demand for higher quality and will transform in improved working environment. The importance of this objective lies in the business logic for less bureaucratic movement of cargo, saving time and money for the cargo owners. Improvement and modernization is also the common goal of every business entity.

Modern information systems for the Danube river transport are already introduced by BPICo. (BulRIS, Single window) and are in process of further improvement. Another dimension of this objective could include actions taken by port operators to implement up-to-date information systems in their everyday port activity. Such systems may include electronic documental exchange with regard to the vessel arrival and departure, cargo documents, forwarding documents, storage management, customer relationship management etc.

The personnel directly involved in port servicing may analyse the results achieved and take certain measures on the basis on their own practice and on already elaborated documents. Such document for example enlists some disadvantages that have to be watched for:

"The other main criticisms of quality of service, which are more organizational, focus on:

- *Availability: range of services provided within the port area;*
- *Speed: time taken to service ships and cargo;*

- *Reliability: consistency of port performance; and*
- *Flexibility: ability to provide alternative solutions when things go wrong*

*****

This can occur for various reasons:

õ *Legislation defining what ports can and cannot do in each Member State;*

õ *Narrow political or management perceptions about the role of ports;*

õ *Lack of space, investment funding or management expertise;*

õ *Aversion to risk; and*

õ *Inertia, lack of vision, or resistance to change."*[23]

Implementation measures

Actions taken by the government to finish the process of concession of BG river ports[24]**.**

Concessionaires risk their own resources and efforts. Providing quality port services in a very competitive environment is a necessity for them. In other words, successful concession depends strongly on improvement of port services and modernization.

There are five river port terminals that are being prepared to be given on concession:

1. Port terminal Winter shelter, Ruse;
2. Port terminal Vidin-center, part of port for public transport of national importance Vidin;
3. Port terminal Ruse-west, part of port for public transport of national importance Ruse;
4. Port terminal Ruse east 1, part of port for public transport of national importance Ruse;
5. Port terminal Ruse-east 2, part of port for public transport of national importance Ruse;

The concession of a port is for management of a service of public interest (the port services under Article 116 (3) p.2 of the MSIWPPRBA) at the risk of the concessionaire, by keeping the port services available and ensuring their continuity and quality level in compliance with the terms of the concession contract, against the concessionaire's right to operate the service, receiving revenues from consumers and third parties, etc.

The Bulgarian state has consequently granted 7 (seven) river terminals with national importance on concession. The above 5 (five) cargo terminals are to be granted in the future. Successful port concession to a private operator was defined as a good practice because it has proved its positive influence on the performance of the ports that have already been granted.

Concession is applied for Bulgarian ports with national importance – Ruse, Lom and Vidin. Most common practice is granting a separate port terminal on concession, as the entire port of national importance most often includes several terminals which are usually located in different cities.

[23] https://ec.europa.eu/transport/sites/transport/files/modes/maritime/studies/doc/2013-07-ia-port-services.pdf

[24] Source for description of this measure: BPICo, D. 4.2.4. Good practices report on port management models

Application is provided by motivated decisions of the Council of Ministers, where the Ministry of transport, information technologies and communication have a major role. Control is ensured with the help of Executive Agency Maritime administration and Bulgarian Ports Infrastructure Company.

From the viewpoint of the state – over 380 thousand euro/ year are collected from fixed fees and the total private investment should amount to over 67 mln. BGN. The income for the state for 2014 is 32,8 mln BGN., and for 2015 – 34,7 mln. BGN. The transport ministry reports a total investment from the side of port concessionaires /15 sea and river terminals/of almost 64 mln. BGN for 2014 and 58.2 mln. BGN for 2015. [25]

Measuring methods that can identify successful port concessions are given in Table 25.

Table 25: Concession performance metrics in Bulgaria

Method of measurement examples
1. Investment according to type – number of new machinery and facilities, number and square meters new storage facilities
2. Collected concession fee
3. Cargo volume
4. Income per person
5. Income per ton
6. Annual profit of the concessionaire
7. Surveys with regard to clients' satisfaction

Source: BPICo

Proposed responsible organisation(s):	Application is provided by motivated decisions of the Council of Ministers, where the Ministry of transport, information technologies and communication have a major role. Control is ensured with the help of Executive Agency Maritime administration and Bulgarian Ports Infrastructure Company
Proposed duration:	permanent
Proposed time frame:	started 2007 and still ongoing

Keeping concessions in force on good level of fulfilment

Finishing the procedure for granting a port on concession is not a success by itself. Monitoring has to be implemented in order to check whether the concessionaire fulfils his obligations, which mainly include:

- Payment of the concession fee by the concessionaire;
- Successful performance of the envisaged port services, with focus on the cargo turnover by the respective port terminal;
- Successful coverage of the investment programme, planned by the concessionaire;

[25] Source: https://www.publics.bg/bg/news/17594/

- Keeping the contract conditions with regard to all financial and non-financial obligations of the concessionaire;

The task for observation and evaluation of the level of concession fulfilment is given to a commission for each port. This commission includes the participation of competent officials from the Ministry of transport, information technologies and communication, BPICo. and Executive Agency Maritime Administration. If violation of concession conditions negotiated is found out, measures have to be proposed and implemented.
This measure has a permanent effect and should last until the expiry of the concession contract.

Proposed responsible organisation(s):	MTITC, port concessionaires, EAMA, BPICo.
Proposed duration:	depending on the concession contract
Proposed time frame:	permanent

Encourage port operators to introduce modernizations by implementing incentives and system for evaluation

Currently there is not a scheme or mechanism on encouraging port operators to modernize their activity. It seems that keeping the legislative requirements is of biggest importance, combined with the limitation of the old fashioned equipment, infrastructure and technologies. It is of crucial importance to introduce a system for stimulation of port modernization through identifying the most significant priorities for the port sector.

Some examples for stimulation could be tax preferences, partial financing of the modernization investment by the state, or other – on individual base dependent on the needs of the port operator. Final result of the improvement expected should be measured by rise in the cargo turnover, reduced time for ships' or vehicle, or wagons stay in port, improved safety and working conditions, etc.

Proposed responsible organisation(s):	MTITC, BPICo., port operators
Proposed duration:	5 – 10 years
Proposed time frame:	2020-2030

Feedback from clients
Except the professional opinion of port related administrative bodies and port operators, dealing with the everyday port management, clients are very important factor to be considered when taking decisions for port services improvement.

For BPICo. the meaning of the term "clients" for this particular analysis is: port users, such as cargo owners, ship owners, forwarders, ship agents, railway and automobile companies, other

companies, providing logistic and technical services connected with the port. Most often port users either have contract relations with the operator, or with the cargo owner. They are the consumers and payers of port services received, and that is why, their position has to be taken into account.

Regular researches, both formal (letters, surveys, questionnaires) and informal (discussions, negotiations, informal meetings) on the opinion of the clients are a must for the successful port management. This measure is and should be implemented by port operators with no need for considerable resources. The higher management (executive director, deputy director, commercial manager) could perform direct conversations, negotiations and meetings, resulting in specific contract conditions. One or more marketing experts (depending on the scope of the operator) could be responsible to collect written surveys and to analyse the answers.

Clients' feedbacks define the strengths and weaknesses of a port terminal, which could be a good base for improvement actions. Furthermore, they have the ability to compare ports, as they most often use the services of national and foreign port terminals along the Danube river for instance.

This also is a measure with constant significance and has to be performed regularly. Performance indicators could include, but are not limited to: number of clients' feedback received, percentage of clients' satisfaction service by service, number of proposed measures by clients and number of their real fulfilment, evaluation of the opinions focused on prices and those, focused on technical issues, profound evaluation of the negative feedback received, which may also include improvement of human resources management, etc.

Proposed responsible organisation(s):	Port operators, BPICo. EAMA
Proposed duration:	permanent
Proposed time frame:	permanent

Objective 3: Identify the most needed, appropriate & cost effective modernization in ports

Collecting information on needed investment in ports will most probably result in a long list of proposals. Taking decision on the, so to say, correct investment, especially when considerable finance resources are required, is a hard process. A complex combination is needed between national and international priorities, marketing based decision and the specifics of each port terminal.

As it was already stated above, the technical condition of ports in Bulgaria is not on the required level in comparison to their Western European counterparts. Due to the big scale of efforts and resources needed to be invested, certain prioritization must take place, in order to keep port services on a good level and in according to the legislative frame in force.

Implementation measures

Identification of modernization measures by collecting expert opinions from the qualified port personnel from each port.

Lack of modernization has long time been a disadvantage for the Bulgarian river ports sector. In order to identify and implement the most important measures with the most significant positive expected effect, opinions have to be collected by the personnel directly involved with the cargo handling and customers' relations. Port operators – private or state-owned – elaborate their own programme for investment and development. Often operators themselves do not have enough resources to fulfil a needed modernization investment. That is why, specific actions have to be foreseen in order to set up an expert group, that could involve experts from the MTITC and BPICo., that could directly interact with the responsible personnel in order to make a list of the proposed modernizations, to collect data on the financial resources and time-frames. Currently there certainly are processes of coordination between BPICo. and port operators with regard to the Annual Program for construction, reconstruction, rehabilitation, maintenance, development and management of the infrastructure of public transport ports of national importance. This measure foresees more strategic approach with long-term planning perspective. The needs for modernization are different for each port terminal and are dependent on the economic condition of the operator, condition of the port infrastructure and equipment, potential of the staff to create and implement investment solutions.

Proposed responsible organisation(s):	Port operators, BPICo. MTITC
Proposed duration:	12 months
Proposed time frame:	2020 - 2021

Elaboration of financial, technical, marketing researches and forecasts

After the process of investment identification and its overall definition, the next step is to further elaborate in detail:

- Financial parameters, such as costs, type of financial resources (own or attracted), payback period, expected revenues if any;
- Technical implementation – description of the area/ sphere of introduction of the modernization, productivity parameters expected, specific requirements related to the port terminal, permits needed, other specific requirements with regard to the legislative framework;
- Marketing justification on the current situation and the expected results after implementing the modernization, relevance and significance for the port activity of the operator, different scenarios of development before and after the investment took place, past and current researches on the modernization envisaged, forecast on the expected improvement (rise in the cargo flow, new types of cargo attracted, new clients attracted, improved speed of handling etc.).

Elaboration on these analyses should be assured by the port operator for their most important investment plans, and by BPICo. for investment, planned by the company. Most probably such documents would be given for execution to specialized companies against certain payment, after the corresponding normative procedure.

Proposed responsible organisation(s):	port operators, BPICo., MTITC
Proposed duration:	12 months
Proposed time frame:	2021-2022

Objective 4: Keep highly qualified personnel within port companies (before and after concession procedures)

The quality of port services depends on the combination between technical equipment and human resources performance. A highly qualified personnel of ports is an important asset, that has to be kept and developed. Currently, the percentage of staff reaching the age for retirement is relevantly high. Assuring continuity of the accumulated knowledge must be done smooth with no negative impact for the company. Additional factor that creates uncertainty and stress is the process of transition from working for a state-owned port operator to a private concessionaire.

The observation of the ongoing and past concessions of river ports in Bulgaria, show that often human resources are object to changes almost from the beginning. Starting from the higher management, which becomes entirely new for the port staff, and usually reduction of the total employee number, or turnover of human resources as a whole follow. This critical process has to assure that the best professionals are kept within the company, because they are responsible for the performance of the port. This objective should be included in the preparation and implementation process for future concessions.

Implementation measures

To introduce/ improve HR measures in the contracts with concessionaires and state owned port operators with regard to personnel: more attractive measures for motivation and low staff turnover – social benefits, good working conditions. For highly qualified staff – higher payment conditions, constant vocational training

These measures speak for themselves and have to be taken into consideration by the Ministry of transport, information technologies and communications (MTITC). In the moment there are no detailed conditions in the existing contracts for the status of human resources in the port operators with 100% state ownership of the capital. Such conditions could be introduced by amending the contracts between these type of operators and the Ministry of transport.
On the other side, concessionaires have contract conditions related to employees, but they are not announced publicly. What is known is that the concessionaire has to ensure healthy and safe working conditions, and training of the personnel involved in port services, and not to hire sub-contractor companies for execution of the port services in the terminal granted.

It is easily seen that human resources are not within the priorities of contractual relations between port operators and the MTITC, being the representative body of the State. That gives certain freedom of the operators to decide on their HR policy, but such measure has to be implemented for ensuring provision of high-quality services.

Firstly, port operators have to make an assessment of their employees, to identify those with the highest contribution for the successful operation, and then – measures for keeping highly qualified and valuable employees have to be introduced.

Proposed responsible organisation(s):	MTITC, port operators
Proposed duration:	12 months
Proposed time frame:	2020-2021

Objective 5: Attract private investment in ports through successful concessions

Private investment in Bulgarian river ports of national importance is possible **only after** granting the respective port terminal on concession. Until this happens, port operators with state ownership are responsible for port management and investment.

As per the data stated in D 4.2.4. Good practices on port management models, the reported figures on private investment is as follows:

Table 26: Concession features in selected Bulgarian ports

Port terminal[26]	Fixed concession annual fee,[27] EUR	Variable concession annual fee, EUR	Total investment for development, mln. BGN
Svishtov (concession in 2007)	207 000	25% of the total gross revenue growth for the current year compared to the base year	19.227
Oryahovo	5 112,92	10% of the growth in gross earnings compared to the base year	2.4
Somovit, 2009 conditions	31 200	7.2% of the increase in total gross earnings of all activities, or a coefficient of EUR 0.348 per ton, multiplied by the increase in annual turnover, relative to the basic annual freight turnover	7
Vidin-north& Ferryboat complex Vidin	41 000	8.40% of the increase in total net revenue versus the base net income or an amount of EUR 0.16 per ton multiplied by the increase in annual turnover	16,039
Lom, 2013 conditions	95 612	Not less than 5% of annual revenue growth or not less than € 0.20 per ton of increase in freight	22,4
Ferryboat terminal Nikopol	1 500	n/a	0,06

Source: BPICo

The overall belief is that investment in this scale cannot be expected by state-owned operators and that private financial resources would be invested with the best marketing and management logic.

Implementation measures

Actions taken by the government to finish the process of concession of BG river ports;
See description of this measure for Objective 2

Objective 6: Increase the share of intermodal transport

Intermodal transport is the combined use of more than one mode of transport during the process of cargo transfer from the starting point to the receiver. As for the Bulgarian river ports, intermodality is performed by the ship – railway scheme. Some ports also offer the land-based intermodal complex between trucks with containers/ trailers and railway transport. Similar to Objective 1, increasing intermodal cargo is beneficial for the total cargo volume and

[26] Source: www.nkr.government.bg
[27] The fixed part is indexed every 5 years of the concession period with the cumulative consumer price index.

generated incomes by port terminals. Unfortunately, for now Bulgarian river ports are not part of many intermodal logistic schemes. That is due to the fact that river transport is relatively slow and insecure for the high-demanding intermodal cargo traffic. Containers, as the widest spread intermodal unit, are transported via high-speed routes on a regular base. Assuring cargo for the empty containers is also a big challenge for the local economy. The most possible version of increasing intermodal cargo in river ports is by using the existing railway connections. Ruse-east, Ruse-west, Svishtov, Lom, etc. have direct railway access under cranes. This is a prerequisite of handling intermodal cargo. Making investment in container/ trailer handling facilities (reach stackers, repair shops, etc.) could make easier attracting intermodal unit operators.

Implementation measures

By taking measures for improvement of the navigability of the Danube river.

Improvement of the fairway of the Danube River and regular maintenance of the required depths would increase reliability of inland waterway transport. Critical hydro meteorological conditions which have led to interruption of navigation have already caused cargo outflow through the years. Taking measures to resolve the problem with the fairway is needed for increasing intermodal transport.

This measure should be performed by all riparian countries.

Proposed responsible organisation(s):	EAEMDR, MTITC
Proposed duration:	permanent
Proposed time frame:	permanent

Boosting national and international economies that generate intermodal cargo.

Ensuring cargo for empty containers has already been mentioned as a problem in bringing intermodal cargo to Bulgarian river ports. Bulgaria has to ensure favourable economic conditions for production companies generating export and intermodal cargo. During high-level official meetings with neighbouring and other countries, contracts may be commented for the mutual benefit of partners. This is a rather hypothetical measure, but in the end ports handle export and import cargo in compliance to the scale and condition of the national economy.

Proposed responsible organisation(s):	forwarding and transport companies, port operators, BG government, MTITC
Proposed duration:	5 – 10 years
Proposed time frame:	2020 - 2030

Working on higher level (government, intermodal organizations and companies) to stimulate intermodality.

Although lot of disadvantages exist that hamper intermodal cargo traffic through Bulgaria, permanent efforts have to be made to mitigate negative consequences. Meetings, analyses and researches have to be regularly performed by affected parties. Professional organizations in the field of intermodal transport, river port operators, forwarders and cargo owners have to identify and propose measures to be taken by the ministries and the government in order to improve the current conditions for intermodal traffic.

Proposed responsible organisation(s):	ship, vehicle and railway carriers, transport organizations and unions, MTITC, port operators
Proposed duration:	permanent
Proposed time frame:	permanent

Objective 7: Improve port infrastructure in order to keep current cargo flow and attract new types of cargo/ new clients

Following the existing weakness of the BG ports "Unsatisfactory condition of the port infrastructure and the connecting infrastructure"[28] BPICo. identified the strategic aim to improve the existing infrastructure. By ***"port infrastructure"*** BPICo. means the complex combination of quays, open and covered storages, administrative and technical buildings, supply networks, etc. Improvement may also be sought in the connecting railway and road networks, but is not under the direct impact of BPICo.

The big importance of Objective 7 is based also on the existing gap between ports from South-East Europe and their Western Europe counterparts. Any delay in improving port infrastructure in Bulgaria may lead to irreversible negative impact on the national river port industry.

There have been a lot of researches on EU, national and international level done, proving that this is a widely known development factor.

"Many ports are unable to provide potential customers with the right mix or standard of services because they do not have the right mix of infrastructure. Common complaints from shipping lines and other port users relate to:
õ *Insufficient depth of water;*
õ *Lack of quay space, resulting in vessels having to wait for a berth;*
õ *Lack of storage space behind the quay, often caused by the "city centre" locations of older ports;*
õ *Insufficient (or outdated) mechanical equipment:*

For container ships the most common problems are too few cranes (preventing the ship from working as many holds as the operator would like) or the absence of ship-to-shore gantry cranes (resulting in slower handling rates). Yard congestion caused by lack of space can also slow down crane handling rates on the berth.

[28] Source: Group of authors (2018), *Danube ports SWOT analysis*, Daphne project, WP6, Deliverable D.6.1.1

For bulk ships the most common problem is lack of automation (ship loaders and pneumatic or screw discharge equipment linked to high speed conveyor systems to the storage area or plant); and

õ *Poor interface arrangements for rail and inland waterway transport."*[29]

Implementation measures

Actions taken by the government to finish the process of concession of BG river ports.

Measure already described for Objective 2.

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. 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.

Proposed responsible organisation(s):	Application is provided by motivated decisions of the Council of Ministers, where the Ministry of transport, information technologies and communication have a major role. Control is ensured with the help of Executive Agency Maritime administration and Bulgarian Ports Infrastructure Company
Proposed duration:	permanent
Proposed time frame:	started 2007 and still ongoing

Keeping concessions in force on good level of fulfilment.

Measure already described for Objective 2.

Proposed responsible organisation(s):	MTITC, port concessionaires, EAMA, BPICo.
Proposed duration:	depending on the concession contract
Proposed time frame:	permanent

To follow quality oriented approach on port concessions

Except evaluating fulfilment of certain figures, such as concession fee, amount of investment, cargo volume, etc. assessment has to be made on the quality behind these figures. It is very substantial not to have pro forma concessions with "hollow" implementation. Quality of fulfilment may be determined by direct communication with the end users of the port terminal from the side of the MTITC or another authorised administration.

Proposed responsible organisation(s):	MTITC, port users, BPICo., port operators
Proposed duration:	permanent
Proposed time frame:	permanent

[29] Source: https://ec.europa.eu/transport/sites/transport/files/modes/maritime/studies/doc/2013-07-ia-port-services.pdf

Granting joint concessions by the state and municipalities to assure investment in projects of bigger scale

Joint concessions have not yet been implemented in Bulgaria. This is due to the fact that the opportunity for such initiative was given by a relatively new legislative amendment.

Joint concessions would bring a number of positive effects. Through co-operation between the concession grantors significant infrastructure objects can be executed that go beyond the territorial scope of a municipality, to allocate public resources required to make payments from the grantors for non-self-financing concessions, assets of the state and the municipalities to be used efficiently. This can reduce the uneven territorial distribution of concessions and the economic differences between the regions.[30]

Proposed responsible organisation(s):	BG government, MTITC, BPICo. EAMA
Proposed duration:	18 months
Proposed time frame:	from 2020 on

Objective 8: Rise the role of the private sector through concession of ports that are not already granted

Bulgarian port sector has long been managed by structures with state ownership. The restructuring process or the river port sector is ongoing. The first concession of a river port was implemented in 2007 for port terminal Svishtov. From then on, the Bulgarian state evaluated the positive effect of such restructuring approach. The commercial risk of providing port services is borne by private companies - concessionaires, while the State is benefiting from concession fees received and investment made in port terminals that remain state ownership. Concession companies benefit from developing their own business initiatives and contribute for improvement of the terminals under their management.

Implementation measures

Actions taken by the government to finish the process of concession of BG river ports

See measure description for Objective 2.

Objective 9: Introduction of an integrated transport system to increase competitiveness

Integrated information systems ensure coordination and communication between different transport participants and modes. Intelligent decisions help for the better organization of the transport route, handling and storage management.

In Bulgarian river ports there is no integrated information system functioning. Existing systems function separately.

[30] Source: National strategy for development of concessions in the Republic of Bulgaria 2018-2027

Different modes of transport have differing technical and operational capabilities. Each mode of transport in the system has to develop its capacity to meet specific demand viewed within the total demand for all modes of transport in the system. In this way, as well as competing with each other, they also supplement each other.

A successful integrated transport system should result in higher demand for public transport, with a knock-on reduction in congestion and pollution[31].
Implementing Objective 9 would directly bring positive influence on Objectives 1 and 6.

Implementation measures

To integrate the River information system (BulRIS) with existing and new information/ management systems in the field of railway and automobile transport, control bodies, etc.

The existing River information system, managed by BPICo., is well functioning and very well technically equipped. Measures could be planned to integrate the structure of the above system with the existing ones of the Customs, Border control or other institutions when needed. Thorough discussions need to be done between related administrative bodies in order to see exactly which functions and databases could be merged. There is possibility to implement such an integrated system by the force of an entirely new legislative document. In order to achieve that, detailed proposition has to be made from the side of implementing administrations to the corresponding ministries and the Government. Although it seems to be a complex procedure, the expected positive results deserve considering sooner actions toward implementation of this measure.

Proposed responsible organisation(s):	BPICo., Customs, Border control
Proposed duration:	24 – 36 months
Proposed time frame:	2020 - 2023

[31] Source: https://www.designingbuildings.co.uk/wiki/Integrated_transport_system

8 Common port industry strategic objectives and measures

8.1 Mission

The common mission of the entire port industry of the Danube region is agreed to be defined in the following way:

MISSION

Danube ports are strategically important and efficient multimodal nodes of the region's transport network enabling the trade objectives, fostering job creation, facilitating trade and sustainable economic growth, providing competitive, efficient, reliable and seamless service, while at the same time respecting the environment and the port governance diversity in riparian countries.

Apart from being important regional transport nodes, Danube ports are located on the multimodal Rhine-Danube Core Network Corridor where the Danube River represents the backbone of the regional transport network. Any network is composed of links and nodes. The entire network is efficient only as its least efficient link or node. The same works for the capacity of the network – the capacity of the link or node with the lowest capacity determines the capacity of the entire network. Therefore, the proper functioning of ports as nodes of both transport and economic networks is of crucial importance not just for the network itself, but also for the economies of port cities and their wider hinterland.

In order to make the common mission possible today and in the short-term future, Danube ports, accompanied by their seaport gate companion, have joined forces into a Danube Ports Network, an organisation sharing the common goals of the prosperity of the region's port industry and the region itself. Danube ports exert their utmost efforts in order to provide modern infrastructure and suprastructure, collaborate with stakeholders to deliver the benefits of trade growth, manage environmental impacts of port operations and development, deliver effective commercial outcomes for customers and facilitate the functioning of supply chains.

8.2 Vision

The Danube port industry has a common vision:

VISION

To become innovative engines of economic growth of the region, providing competitive, sustainable, diversified, seamless and integrated services with state of the art infrastructure and suprastructure, accompanied by the wide array of value added services and facilitate the integration of the Danube region and its inland waterway transportation into intra-European and global supply chains.

Following a lore "*United we stand, divided we fall*"[32] Danube ports recognized the benefits of joining their development efforts. Danube ports are determined to make the vision possible and therefore are committed to implement the development strategy based on both common and individual development objectives. Joining forces in knowledge sharing, technology transfer, know-how management, law and policy making, lobbying and marketing are just a few of the aspects that are covered in the national and common (regional) port development strategies. Each strategic objective is accompanied by at least one implementation measure intended to facilitate the achievement of the objectives.

"Go logistic" is, in a nutshell, the most important element of the vision of the Danube ports. Danube ports are the only nodes in the transport network providing the facilities for multimodal transfer of goods in all three "land based" transport modes – rail, road and inland waterways transportation, offering their users the choice of using the most convenient mode of transport, depending on their needs. In addition, the concentration of different transport modes, accompanied by physical facilities for cargo transfer and storage, can trigger the demand for complementary and value added services for ships and cargoes. Consequently, in order to cut costs and benefit from spatially centralised logistic activities, ports offering value added services can attract port users to relocate at least part of their facilities in or near port areas, contributing to the concentration of both logistic and manufacturing activities in the immediate vicinity of ports. Spatial concentration of economic activities and cargoes frequently leads to creation of critical masses of cargo quantities suitable for inland waterway transportation and for containerisation of adequate cargoes.

[32] Vernon, J. (Tr.) (1912), "The Four Oxen and a Lion", in: *Aesop's Fables*, William Heinemann, London.

8.3 Core values of the Danube region port industry

Common core values of the Danube region ports focus on their excellence and commitment to grow and serve their communities facilitating the supply chains and economic growth.

INNOVATION
Danube ports embrace change and opportunity to create and innovate pursuing new ideas to improve governance, management and operations.

SUSTAINABILITY
Danube ports are responsible caretakers of all assets entrusted to them to build, use, respect and pass on to the next generations.

COLLABORATION
Each port has particular expertise on its own. It's collaboration that allows the collective expertise to be well-leveraged in the common goals. Working together can only bring benefits and win-win situations since "united we stand, divided we fall".

SERVICE EXCELLENCE
Going above and beyond to exceed expectations, keep the existing and attract new users.

FLEXIBILITY AND ADAPTABILITY
Customers are in the centre of port activities and they are served efficiently, their changing demands are met with flexibility and adaptability.

EMPLOYEES SATISFACTION
Knowing that skilled workforce is in deficit and hard to find and form, Danube ports pay utmost attention to the health, safety, satisfaction and well-being of the employees in port authorities and port operators. Ports assist the continuous learning, training and development of port employees and encourage the creation of the work culture of collaboration and teamwork.

GROWTH FACILITATION
Using their potentials, wisely combined with strategic development objectives, their position within the transport networks and the nature and scope of their activities, Danube ports strive to become magnets for both logistic and manufacturing companies. This is thanks to the favourable settlement conditions, land planning policies, ability to exploit the benefits of multimodality and intermodality.

8.4 Objectives and measures

Based on a common goal of the Danube region port industry to make the ports attractive for business and production, ports have to improve their efficiency, attractiveness for settlement of different logistic and manufacturing industries in and near port areas, and to integrate themselves into supply chains as much as possible. In the situation where the transport of high-value goods (which are usually containerized) is virtually non-existent on the Danube

and its tributaries, this may be a difficult task, but certainly not an impossible one. It, however, requires commitment, flexibility, endurance, persistence, a lot of hard work together, and, above everything, political will to *change*.

On the basis of the SWOT analysis elaborated on a triple level (individual ports, national port industries and regional port industries), Danube region ports have agreed the common strategic objectives and appropriate implementation measures for the development of the regional port industry. Following the process of merging the similar objectives and implementing measures, the summary of filtered and fine-tuned[33] common strategic objectives and measures is given in Table 27 below.

Table 27: Summary of common objectives and development measures for Danube ports

Strategic objectives	Necessary development measures
1. Connect Danube ports with new routes and new markets ("Belt & Road Initiative" - BRI) (SWOT Ref.: S1O9)	• Investigate options of connecting the Danube ports to the BRI corridors • Present the possibilities of Danube ports to the relevant Chinese partners
2. Increase competitive position in respect to road and rail by attracting new markets and fostering multimodality (SWOT Ref.: W13O3O10)	• Facilitate development of hybrid logistic zones in or adjacent to ports
3. Use experience in project preparation to improve the situation by using public and EU funds (SWOT Ref.: S7T10T11)	• Engage experts to assist in preparation of high quality project proposals
4. Use public, EU and private funds (PPPs) to renew infrastructure, suprastructure, equipment and hinterland connections and prioritize investments (SWOT Ref.: W3W4W14W15O2)	• Create inventory of projects and prioritize them • Ensure the highest level of relevance, maturity and impact for priority projects to be applied for EU co-funding • Influence (lobby at) DG MOVE to secure sufficient budget for priority investments in inland waterways and ports
5. Increase coopetition levels between ports, and especially between ports in proximity (SWOT Ref.: S5O16)	• Investigate business & market segments in which ports can cooperate for common interest, while competing in basic services
6. Attract industrial facilities in or adjacent to port areas (SWOT Ref.: S9O3O5)	• Create joint commissions of port authorities with spatial planning institutions
7. Move towards specialized markets (SWOT Ref.: S11O10)	• Undertake specialized investigations, market research and studies (e.g. for high & heavy, a.k.a. "project" cargo, LNG, biomass, vehicles, etc.)

[33] For these reasons, the objectives and their implementation measures are slightly different from those listed in the Deliverable 6.1.2 List of objectives and necessary development measures of the WP6 of Daphne project.

Strategic objectives	Necessary development measures
	• Make use of the objective of the proposed CEF II "adaption of the TEN-T network to military mobility needs".
8. Provide life-long training and specialization in modern port operation and management (SWOT Ref.: S12O13O14)	• Organize annual courses on various topics of port industry
9. Proactive attitude towards "greening" of ports (SWOT Ref.: S7S11T12)	• Regular calculation of GHG emissions in ports • Environmental certification • Compulsory shore-side electricity supply for vessels • LNG supply and bunkering stations for vehicles and vessels in ports • Electrification of port internal railways • Alternative powered handling equipment
10. Focus on multimodality (by offering a wide range of road and rail services in port areas) (SWOT Ref.: S6S10T3)	• Attract road and rail operators to use ports as their hubs by incentivizing them or through attractive pricing schemes • Make infrastructure adjustments facilitating intermodal operations
11. Prepare mitigation measures to combat market volatility, seasonal effects and unpredictability (SWOT Ref.: S8T5T6)	• Diversify services and focus on multipurpose terminals for non-sensitive goods • Develop a concept of "flexible inland port" • Develop a concept of "flexible" concessions • Explore advantages of mobile cranes instead of quay-track mounted cranes
12. Use modern technologies and digitisation to reduce bureaucracy and increase efficiency (SWOT Ref.: S12T7)	• Use Port Community Systems • Exploit RIS based technologies for port planning • Harmonize ship and cargo document requirements • Investigate possibilities for IWT/Port Single Window Systems and paperless document processing
13. Create redevelopment policies to optimize the facilities and available space (SWOT Ref.: W1O3)	• Diagnose and locate overcapacities and optimize available space for diverse port and logistic functions • Optimize and/or modernize handling equipment
14. Create long-term port strategies using skilled professionals and cooperation/networking possibilities (SWOT Ref.: W6O13O16)	• Formulate flexible strategies and provide regular updates
15. Join forces for common cause in port and shipping development (SWOT Ref.: W11W12O11O16)	• Create functional and active association for port networking

Strategic objectives	Necessary development measures
16. Optimize port development and capacity through pricing (SWOT Ref.: W1T3)	• Investigate and assess the impact of different pricing systems as tools for port and hinterland development and capacity optimisation
17. Rehabilitation of port facilities (in order to lower the logistic costs and keep the industries in or near ports) (SWOT Ref.: W3T8T9)	• Reconstruct sloped quay walls into vertical ones • Facilitate of unused "second row" land for industrial and/or logistic use
18. Matching the demand and development plans and seek for realistic investment options (SWOT Ref.: W5T13)	• Match the port planning with transport infrastructure and regional economic plans • Facilitate private involvement in port financing
19. Increase awareness of port importance and attract new skilled workforce (SWOT Ref.: W11T14)	• Ensure wider social acceptance and awareness of ports • Provide favourable working conditions in ports
20. Improve and maintain the treatment of ports as public goods of strategic national importance (SWOT Ref.: W13T16)	• Promote ports as strategic objects of national transport infrastructure • Protect public interest and public domain in ports

(Source: iC)

8.4.1 Objective 1: Connect Danube ports with new routes and new markets (BRI)

The *Belt and Road Initiative* (BRI), also known as the *One Belt and One Road Initiative* (OBOR), is a development strategy proposed by Chinese Government that focuses on connectivity and cooperation between Eurasian countries. It is short for the Silk Road Economic Belt and the 21st-century Maritime Silk Road.

"One Belt" - The Silk Road Economic Belt

The silk road economic belt was also referred to as "One Belt" in short. It represents a regional economic cooperation strategy proposed by China in 2013. One Belt aims to develop the economic partnership between China and countries and regions along the land silk road and plans to strengthen the infrastructure construction along the route. One Belt links the Asia-Pacific region and Europe, such as China, Russia, Kazakhstan, Kyrgyzstan, Tajikistan and Uzbekistan along the silk road as well as the other three five observer states and dialogue partners. *There are two main routes* for One Belt, starting from China and ending in Europe. The *first route* goes to Europe via central Asia and Russia. The *second route* stretches through central Asia and west Asia to the Persian Gulf and the Mediterranean countries.

"One Road" – The 21st Century Maritime Silk Road

The 21st century maritime silk road is also known as "One Road" in short. It encompasses the economic cooperation between China and southeast Asia, South Asia, the Middle East, north Africa and Europe along the maritime silk road.

There are *two main directions* for One Road: the *first* is to reach the Indian Ocean from China's coastal ports and extend to Europe. The *second* is from China's coastal ports through the south China sea to the south Pacific.

Overview map of the BRI is given in Figure 10.

Currently, out of 16 countries of Central and Eastern Europe, seven countries in the Danube region are included in the BRI: Slovakia, Hungary, Croatia, Serbia, Bulgaria, Romania and Bosnia and Herzegovina.

Figure 10: Belt Road Initiative and its main land and maritime components

(Source: https://www.topchinatravel.com/silk-road/one-belt-one-road.htm)

Investigation of options on how the Danube region ports and Danube IWT can benefit from the BRI is worth the efforts, taking into account the vast potentials for capturing the cargo flows in the BRI.

8.4.1.1 Implementation measures

8.4.1.1.1 Investigate options of connecting the Danube ports to the BRI corridors

Within the BRI mega project, which is one of the most ambitious, and probably the world's largest infrastructure project, there is a so called "16+1 Initiative". It is aimed at intensifying and expanding cooperation with 11 EU Member States and 5 Balkan countries, whereas 7 out of 16 countries belong to the Danube region. The cooperation encompasses the fields of investments, transport, finance, science, education, and culture. In the framework of the initiative, China has defined three potential priority areas for economic cooperation: infrastructure, high technologies, and green technologies. Danube ports, including the seaport of Constanta as its main sea gate can be used as hubs for the goods flowing from/to China mainland not just using the waterborne transport but also rail transport. In this view, the Danube ports should seriously investigate the options of becoming the hubs of the BRI routes in the forthcoming period.

In order to step from memorandums into implementation of opportunities arising from the BRI, Danube ports should propose concrete joint development projects on the one hand, and analyse the possibilities of harmonization of the port development strategies with development strategies of the BRI priority areas.

For the Danube countries, there is nothing unnatural or "anti-European" in multilateral or bilateral partnerships with Chinese counterparts. In the "rich West", even though Chinese foreign direct investments (FDI) are on the decline in Europe since 2014 due to stricter procurement rules and FDI screenings of the host countries, Chinese FDI in Europe reached 17.3 bn EUR[34] in 2018. The three largest EU economies, logically received the largest share of investments. The United Kingdom (4.2 bn EUR), Germany (2.1 bn EUR) and France (1.6 bn EUR) continue to receive the most attention, followed by the "newcomers" such as Sweden, Luxembourg, Belgium and The Netherlands. Sectors of transport, utilities and infrastructure, and real estate received the lion's share of the Chinese FDI.

Proposed responsible organisation(s):	Port authorities, port operators, joint teams with rail and logistic operators
Proposed duration:	48 months
Proposed time frame:	Month 1 – Month 48

8.4.1.1.2 Present the possibilities of Danube ports to the relevant Chinese partners

One of the good examples of cooperation in transport infrastructure is the recent trilateral agreement on railway investment between Hungary, Serbia and China. The Budapest-Belgrade railway project is worth 2.65 bn EUR and 85% of the Hungarian share of the rail would be financed by a 20-year loan from China. This railway would be part of the Land Sea Express Route which links Chinese-owned port Piraeus in Greece with Macedonia, Serbia and Hungary and completes part of the European leg of the BRI. Possibilities for Serbian and

[34] https://www.merics.org/en/papers-on-china/chinese-fdi-in-europe-2018 (accessed 21 April 2019)

Hungarian inland ports laying on this route are numerous. Similar possibilities exist for other Danube country's ports capturing the cargo flows not only from the Danube IWT, but also from other road and rail routes that are, or could be connecting branches of the various BRI legs in Europe.

Once all integration and cooperation possibilities are analysed and agreed among Danube ports as a single "negotiating side" or port by port, these possibilities should be presented to relevant political level. Meetings of the "16+1 Initiative" are a good place to spark a discussion on projects involving the integration of Danube ports into the elements BRI project and organize meetings on port investment opportunities at least on the margins of the next 16+1 Summit which will take place in 2019 in Croatia, for the beginning. Members of the Danube Port Network should investigate partnership possibilities in more details in the forthcoming period.

Proposed responsible organisation(s):	Port authorities, port operators, DPN, ministries of transport, ministries of economy
Proposed duration:	59 months
Proposed time frame:	Month 13 – Month 72

8.4.2 Objective 2: Increase competitive position in respect to road and rail by attracting new markets and fostering multimodality

Due to geographical distribution of trade patterns in the Danube region, where many overseas trade routes of the Danube countries use Adriatic, Aegean and even North Sea maritime ports, inland ports competitive potential is limited, if their focus remains only on Danube based IWT. For this reason, Danube ports should pay special attention to capture an important share of road and rail traffic needing logistic centres for various value added services for cargo. By capturing additional cargo from rail and road, and acting as real multimodal transport nodes, ports can benefit from the effect of spatial concentration of cargoes and related services which leads to economies of scale. This, in turn, leads to the appearance of critical masses of cargoes convenient for inland waterway transportation. This objective is closely related to Objective 6: Attract industrial facilities in or adjacent to port areas.

8.4.2.1 Implementation measures

8.4.2.1.1 Facilitate development of hybrid logistic zones in or adjacent to ports

In order to attract more cargo from all land-based transport modes (IWT, rail and road), ports should consider development of port-centric hybrid logistic zones[35] (HLZ). HLZs enable the concentration of manufacturing, processing, transport, logistic and trade activities in or adjacent to port areas, wherever and whenever physically possible. This can be realized through creation of special economic zones which, in their nature, should be a hybrid of industrial zones, free zones and logistic zones.

[35] Group of authors (2018), *Guidelines for Industrial Development in Ports*, Daphne project, WP5, Deliverable D.5.1.3

Port-centric hybrid logistic zone encompasses three basic elements: an industrial zone, a free zone and a logistic zone. These three elements may all be within the limits of the port areas, but they can also be outside the official port areas and in this case they should be located adjacent to port areas whenever possible.

Proposed responsible organisation(s):	Port authorities, ministries of transport, ministries of economy, logistic zones authorities/operators, Customs, Chambers of Commerce
Proposed duration:	83 months
Proposed time frame:	Month 13 – Month 96

8.4.3 Objective 3: Use experience in project preparation to improve the situation by using public and EU funds

The success of port related projects and their chances for obtaining funding from the relevant EU funds greatly depend not only on the technical quality and justification of projects, but also on the good preparation of the project proposals. For this reason, the preparation of the project proposals strictly according to the requirements of the funding instrument is of high importance and great attention should be paid in this respect.

8.4.3.1 Implementation measures

8.4.3.1.1 Engage experts to assist in preparation of high quality project proposals

This measure requires capitalization on successful projects funded by, for example, EU funds. Due to limited budgets, not all submitted projects can be financed, but have to withstand fierce competition from other projects from many EU Member States and, in certain cases, neighbouring states. If sufficient experience in writing of project proposals does not exist in the port authority (or any other organisation in charge), applying port authorities have the option to engage external expertise in project preparation. This measure has been applied throughout Europe for decades with notable success.

Proposed responsible organisation(s):	Port authorities, port operators, DPN
Proposed duration:	71 months
Proposed time frame:	Month 13 – Month 84

8.4.4 Objective 4: Use public, EU and private funds (PPPs) to renew infrastructure, suprastructure, equipment and hinterland connections and prioritize investments

Since investments in port infrastructure are considered as capital investments (capital intensive), port authorities frequently cannot fund all port projects on their own. For this reason, the use of public funds (municipal, national, supranational, etc.) is often inevitable. The use of such funds require strict rules in procurement and project screening. On the other

hand, public funds are more and more accompanied by private sector investments in the so called "public-private partnerships" (PPP). Even though port investments are, by scope and nature, significantly less capital intensive than, for example, railway investments, number of port projects that received EU funding from the CEF funding instrument since 2014 is still rather low[36] (Figure 7). In this figure, port projects are "hidden" in the categories "Maritime", "Inland waterways" and, to a certain extent, "Multimodal". Projects in the category "Inland waterways" mostly refer to infrastructure interventions in rivers and canal and in locks, while only a few involve inland ports.

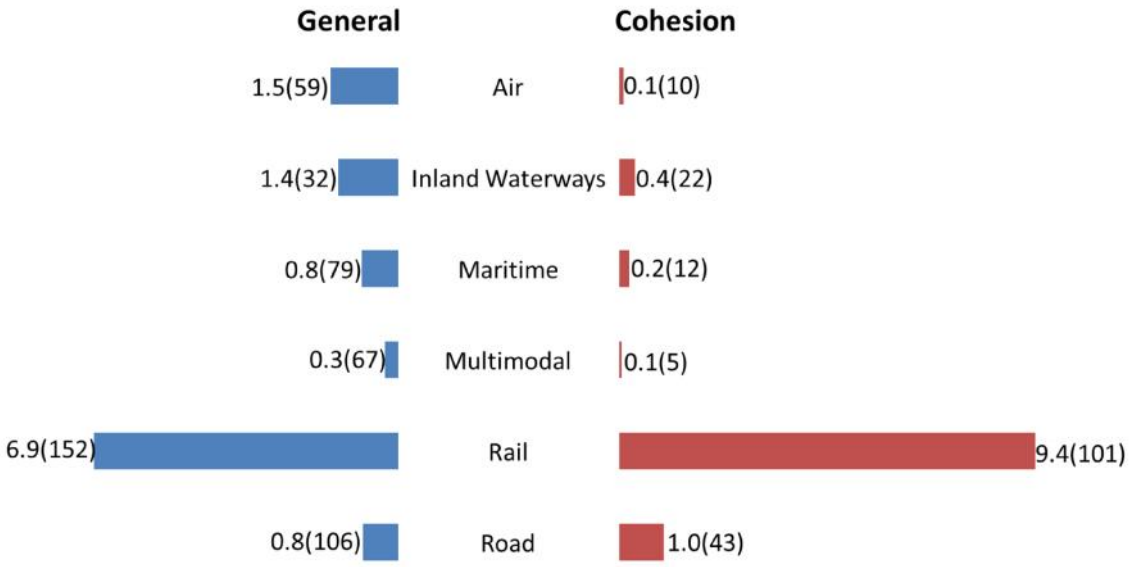

Figure 11: CEF transport funding per mode (in bn EUR)

(Source: Bernardi, B. Making implementation happen, presentation given at the Danube Ports Network conference Danube Ports in the digital age: challenges & opportunities, Vienna, 11 April 2019)

In addition to public funds, ports can benefit from private investments in the various forms of PPP which are still not numerous in the Danube region. Therefore, it is necessary to make more use of the available funds for the development of inland ports. Various measures are agreed for this purpose.

[36] Bernardi, B. (2019), *Making implementation happen*, presentation given at the Danube Ports Network conference "Danube Ports in the digital age: challenges & opportuities", Vienna (see more at: http://www.interreg-danube.eu/uploads/media/approved_project_public/0001/30/0bd26f9facbaeb21cedc9721892a3c7d2388d16c.pdf)

8.4.4.1 Implementation measures

8.4.4.1.1 Create inventory of projects and prioritize them

In order to systematize the port investments, port authorities should first create the inventory of port projects. This is usually done in national port development strategies and master plans. The latter can also be on the individual port level in order to increase the degree of concreteness. Projects planned to be funded by EU funds are also included in the so called "Operational programmes" of EU Member States. The programmes are prepared by each Member State and/or region, and financed under the European Regional Development Fund (ERDF) or the Cohesion Fund (CF). In addition, the inventory of projects is also created in the Core Network Corridor studies[37] and serves, inter alia, as an input for the budget preparation for the next financing period. Each country or each port authority should prioritize their projects according to their importance, maturity or any other adopted criteria. This helps in securing national or supranational funds for port development.

Proposed responsible organisation(s):	Port authorities, port operators, ministries of transport
Proposed duration:	60 months (and continuous, prior to each financing period)
Proposed time frame:	Month 1 – Month 60

8.4.4.1.2 Ensure the highest level of relevance, maturity and impact for priority projects to be applied for EU co-funding

When applying for co-funding from various EU funding instruments (e.g. CEF), port authorities should ensure that only high quality projects with the highest level of relevance, maturity and impact are submitted. In this way, applying port authorities (or other relevant organisations) will not only save time, efforts and resources, but will also stand better chances to receive the necessary funds. Good projects need to be relevant for the programme and priorities of the call for proposals and to be well advanced (mature) in terms of preparation. Mature projects are those projects which are ready for implementation, meaning, for example, projects which already have their preparatory and design studies, building permits already obtained or soon to be obtained, contracting and procurement issues either completed or well advanced, etc. Projects with high impact are those port projects justified by the existing or forecasted demand, projects resulting in important socio-economic gains such as capacity increase, congestion reduction, modal shift, reduction of negative externalities, increase of competitiveness, employment creation, etc. High quality project include well justified and detailed cost estimation or cost breakdown and a good risk management.

Proposed responsible organisation(s):	Port authorities, port operators, ministries of transport
Proposed duration:	60 months (and continuous)
Proposed time frame:	Month 1 – Month 60

[37] https://ec.europa.eu/transport/themes/infrastructure/ten-t-guidelines/corridors/corridor-studies

8.4.4.1.3 Influence DG MOVE to secure sufficient budget for priority investments in inland waterways and ports

Although very limited as the EC takes inputs from Member States only (not any other governmental levels or public/private organisations), this measure is very important and requires an indirect approach. This indirect approach calls for the national lobbying first, since the EC asks the Member States for call priorities in the CEF committee. Therefore, individual port authorities should be very active at national lobbying and can be assisted by joint efforts and knowledge sharing between the members of the Danube Ports Network.

Proposed responsible organisation(s):	Port authorities, port operators, national governments
Proposed duration:	24 months
Proposed time frame:	Month 1 – Month 12 & Month 85 – Month 96

8.4.5 Objective 5: Increase coopetition levels between ports, and especially between ports in proximity

Ports are, or tend to be, and should be the engines of economic growth of their host cities and regions. The more successful ports, the more competitive cities and regions. For this reason, ports need to be governed and used properly, with high levels of efficiency and effectiveness, providing tangible values for money of their users. In addition, ports need to be capable of adapting to dynamic needs of their customers and constantly work on the loyalty of existing customers and on attracting the new ones. All these new roles of ports require new assets, time, efforts, know-how and last, but not least, funds. On the other hand, ports wage a constant battle to reduce costs and thus offer lower prices to their users. Space for providing additional funds for ports' new roles is extremely limited, whether it comes from public funds or from provision of port services. All this have a critical influence on ports' competitiveness, forcing ports to be more exposed to the market and to collaborate with other ports in issues of common interest or even national interests. The constant need for competitiveness and the need to cooperate with other ports gave birth to cooperative competition baptised as neologism called "coopetition". This practice occurs when competing ports in the same or overlapping hinterland work together on parts of its business, in which they recognise they do not have competitive advantages, thus sharing common costs.

One of the most straightforward examples of coopetition is found in automotive industry. Many car manufacturers, which are fierce competitors, cooperate with each other in, for example, shared development and production of certain automobile parts. Moreover, car manufacturers enjoy economies of scale by sharing suppliers, distributors and even production lines.

8.4.5.1 Implementation measures

8.4.5.1.1 Investigate business & market segments in which ports can cooperate for common interest, while competing in basic services

In port coopetition, ports must thoroughly investigate and clearly define in which business and market segments they should compete and in which segments they can cooperate. Desirable competition should be a must in services, cargo, concessions agreements, lease agreements, marketing strategies, pricing strategies, etc. Nevertheless, the room for cooperation between ports on the national and regional level is spacious and include associations, port community systems, legislation and regulation, security and safety issues, know-how sharing, exchange of expertise, training, lobbying for common interests, joint hybrid logistic zones, integration into supply chains, hinterland connections (the last three segment are of special interest for ports in proximity) and research and development. Ports in proximity have another operating pattern they might want to consider – specialization in certain port services, such as specific bulk cargo handling or specific types of logistic services for specific cargoes, etc. Two or more ports in proximity, specialized according to their own agreement, can therefore join forces in many other segments thus practicing coopetition.

Proposed responsible organisation(s):	Port authorities, port operators
Proposed duration:	30 months
Proposed time frame:	Month 1 – Month 30

8.4.6 Objective 6: Attract industrial facilities in or adjacent to port areas

This objective is in close liaison with the Objective 2 and thus should be tackled in parallel. Being centres of cargo distribution to/from their hinterlands via, in most of the cases, three transport modes, ports are not merely transshipment points but hubs of various economic activities related to cargo handling, including the widest possible array of value added services related to cargo, vehicles and vessels, including their crews. Being such dynamic centres of economic activities, ports are ideal magnets for various manufacturing and logistic industries, provided that such industries are offered the right conditions for settlement in the port area or in the areas adjacent to ports.

Consequently, in order to cut costs and benefit from spatially centralised logistic activities, ports offering value added services can attract port users to relocate at least part of their facilities in or near port areas, contributing to the concentration of both logistic and manufacturing activities in the immediate vicinity of ports. Spatial concentration of economic activities and cargoes frequently leads to creation of critical masses of cargo quantities suitable for inland waterway transportation and for containerisation of adequate cargoes.

8.4.6.1 Implementation measures

8.4.6.1.1 Create joint commissions of port authorities with spatial planning institutions

This measure is needed in order to ensure that the port land is extended or reserved and that the land becomes available for industrial and logistic operators, not just port/terminal

operators. In case of scarcity of land in port areas, available land slots in the immediate vicinity of ports should be considered for these purposes. Taking into account the fact that the land along the river banks is a finite resource, and, in most of the cases, considered a public good or public domain, its use should be very carefully planned and optimized. Instead of scattering various logistic and manufacturing activities throughout a determined city or area, their concentration should be planned whenever possible, for a number of spatial, transport, logistic, economic, environmental and socio-economic reasons.

Joint commissions with spatial planning institutions, assisted by logistic operators, should agree on the planning and regulatory aspects in such way to enable/simplify the establishing of hybrid logistic zones with logistic, processing and manufacturing contents in ports or in their immediate vicinity. This will contribute to the spatial concentration of activities and cargoes, making possible the generation of critical masses of goods needed to trigger the substantial and relatively stable demand for inland waterway and intermodal transport. Alternatively, in case when the settlement of logistic and/or manufacturing activities within port areas is not possible, or economically justified, port authorities should lobby that the land slots in the immediate vicinity of ports are reserved for logistic and manufacturing (industrial) zones.

Proposed responsible organisation(s):	Port authorities, ministries of transport, ministries of construction, spatial/urban planning institutions & authorities, logistic operators
Proposed duration:	48 months
Proposed time frame:	Month 13 – Month 60

8.4.7 Objective 7: Move towards specialized markets

The purpose of this objective is dual. First, inland waterway transportation, including inland ports, needs to attract more cargo for a great deal of reasons. In the conditions of relatively stable cargo flows of mass goods on the Danube for decades (even centuries in case of certain cargoes), room for substantial increase of traditional mass cargo quantities is limited. Therefore, the move towards new and/or specialized markets is seen as one of the possibilities to bring more cargo to inland ports. Second, the specialization of ports is seen as one of the ways how to minimize the negative competition, or over-competition, especially between the ports in proximity. Competition is regarded as highly welcome from the users' point of view as it brings lower prices of port services. However, fierce competition battles fought only with constant price decreases can easily end up in either port operators' bankruptcy and in a decline of overall efficiency and competitiveness of ports and, through a domino effect, of their host cities and regions. Specialisation can occur even in the case of relative lack of spatial concentration of ports in certain areas. In general, two kinds of port specialisation may happen. The more obvious specialisation can be seen in the emergence of a small number of niche ports/terminals that specialise in handling specific cargo (including niche cargo) and perhaps a few other commodities. The subtler specialisation is the process whereby cargo shippers/receivers tend to concentrate the bulk of their operations in fewer ports. Ports can also tend to specialise their cargo handling operations around a smaller number of cargo owners.

8.4.7.1 Implementation measures

8.4.7.1.1 Undertake specialized investigations, market research and studies

Potentials of niche markets and specialisation of ports have already been studied in a number of studies. Such practice should continue but in far greater details. Good example of the depth of analysis can be found in the study on transport of biomass "Energy Barge"[38] – an Interreg DTP project, or in the CEF funded project "LNG Master Plan for Rhine – Main – Danube"[39]. Detailed studies and market investigation should be undertaken for Ro-Ro cargoes (e.g. automotive industry logistics), high and heavy (a.k.a. "project") cargo, cement, LNG/LPG as cargo, etc. Of course, detailed investigation on any other specific cargo in inland ports is a subject of either individual or common needs.

Proposed responsible organisation(s):	Port authorities, port operators, DPN, logistic operators
Proposed duration:	48 months
Proposed time frame:	Month 1 – Month 48

8.4.7.1.2 Make use of the objective of the proposed CEF II adaption of the TEN-T network to military mobility needs

Multiannual Financial Framework for the period 2021-2027 foresees, under the CEF budget line for the transport sector, a new envelope dedicated to military mobility needs. European Commission has developed an Action Plan[40] to improve military mobility within and beyond the European Union. Concrete actions are proposed in the following areas: military requirements, transport infrastructure and regulatory and procedural issues. When it comes to transport infrastructure, in 2019 "the Commission will identify the parts of the trans-European transport network suitable for military transport, including necessary upgrades of existing infrastructure (e.g. the height or the weight capacity of bridges). A priority list of projects will be drawn up. The Commission will take into account possible additional financial support for these projects in the next multiannual financial framework." In addition, by 2020, the Commission will assess the need to adapt the trans-European transport network Regulation to include upgraded technical requirements – possibly also covering military requirements.

In 2017, a pilot exercise was performed as a feasibility check for an EU wide approach for identification of weak points in transport networks for military purposes. This pilot exercise identified that there are major opportunities for dual-use civilian-military infrastructure, amongst others in *multimodal platforms* allowing to quickly shift assets from *ports* and airports to rail and road, in improving the capacity of *inland terminals* and in adequate loading gauges on freight rail lines.

[38] http://www.interreg-danube.eu/approved-projects/energy-barge
[39] http://www.lngmasterplan.eu
[40] https://ec.europa.eu/transport/sites/transport/files/2018-military_mobility_action_plan.pdf

Although currently there are no clear indications on infrastructure requirements in inland ports in terms of military mobility, inland ports should be wary as CEF 2 budget will contain significant funds for the purposes of military mobility on the transport network.

Proposed responsible organisation(s):	Port authorities, ministries of transport, ministries of defence, ministries of interior
Proposed duration:	24 months
Proposed time frame:	Month 1 – Month 24

8.4.8 Objective 8: Provide life-long training and specialization in modern port operation and management

Skilled workforce in port governance, port management and port operations is generally very scarce. Only a few universities in the Danube region offer a curriculum involving detailed studies on port and waterborne transportation. Until this situation is improved, Danube ports should find a way to form their own skilled workforce, provide life-long training and on-site training of existing and prospective employees in all segments of port industry. In this way, ports will ensure the steady flow of educated, trained and motivated employees which will provide a foundation for the efficient and effective governance and exploitation of ports.

8.4.8.1 Implementation measures

8.4.8.1.1 Organize annual courses on various topics of port industry

In addition to the efforts directed towards universities and vocational schools to include port specific curricula in their programmes, Danube ports should organize their own annual courses in various and practical segments of port strategies, port policy, port development, port governance, port management, port financing, port concessions, port planning, port operations, port technology, port economics and any other port related topic that may be needed for any particular port. These courses can be organized with or within universities, but not necessarily. Good example of university based course, which can be further developed, is found in Hungary. In 2017, for the first time in Hungary, 20 professionals successfully graduated in port operator studies at University of Dunaújváros thanks to the cooperation of Hungarian Federation of Danube Ports, Ecotech Nonprofit Zrt. and the university. This training program filled a niche according to port stakeholders, since port operation, administration and management competencies need to be harmonized along the Danube to upgrade the quality of services provided in inland ports. Future plans of the organizers include raising the training program to international level, and it is foreseen in a joint effort.

Proposed responsible organisation(s):	Port authorities, port operators, educational institutions, DPN
Proposed duration:	84 months (and likely to continue after the strategy period)
Proposed time frame:	Month 13 – Month 96

8.4.9 Objective 9: Proactive attitude towards "greening" of ports

Good environmental performance of IWT per transported ton of cargo was one of the important reasons for supporting the modal shift from road transport to rail and IWT for decades. Consequently, the inland ports benefited from such initiatives. Nevertheless, an environmental impact of port operations and development started attracting attention in the recent years. In the past, this was more critical for seaports, but since the inland ports have also entered into the focus of the attention, this issue becomes very important for inland ports as well. Ports leave their environmental footprint through operations with vessels and cargo handling equipment, various industrial activities in ports, construction, port expansion of port lands, infrastructure works on access roads and rails, waste disposal, etc. In order to maintain the image of the "good guys" in terms of environmental performance, ports have to comply with ever increasing environment related regulatory and societal requirements. For this reason, ports should try to minimize emissions of both current activities and planned development activities. All activities connected with the reduction of the environmental footprint of ports are frequently and colloquially called the "greening of ports".

For the reasons of achieving a positive environmental and societal "image", ports should be more proactive than reactive to environmental issues related with port activities. Ports with constant and strong positive environmental records are more likely to be positively regarded by the society and, more and more, by users.

Guided by this objective and by the recommendations from the report Green Port Policy Guidelines[41] developed within the Daphne project, several implementation have been developed.

8.4.9.1 Implementation measures

8.4.9.1.1 Regular calculation of greenhouse gasses (GHG) emissions in ports

Ships calling ports, as well as fossil fuel driven cargo handling equipment and vehicles leave the strongest environmental footprint, in terms of air pollutants such as CO_2, SO_2, NO_X, PM, HC and VOC (Volatile Organic Compound). Many ports in the world are using various methodologies and GHG emission calculators in order to have the quantitative estimation of their environmental footprint and set standards or determine benchmarks with other ports. There is a great number of ready solutions in form of GHG calculators and software around the globe, especially for seaports. As an example, many Finish port authorities use the Portensys[42], a Web-based inventory tool for Finnish ports to calculate their operational emissions. The tool contains two modules, one for marine vessels and one for landside sources such as cargo handling equipment, trucks and cars, and also includes fuel consumption estimates. Many Finnish port authorities are required by their environmental permit to document emissions on an annual basis. Seventeen (17) Finnish ports are using the system to develop their emission estimates. Danube ports should also regularly calculate their GHG

[41] Group of authors (2019), *Green Port Policy Guidelines*, Daphne project, WP 4, Output 4.3, Part 1
[42] https://www.satamatieto.fi/portensys

emissions in order to either respect the environmental regulations or to respect their own standards and benchmarks and, when necessary, take evasive or mitigating measures.

Proposed responsible organisation(s):	Port authorities, environmental authorities
Proposed duration:	96 months (and likely continued after the strategy period)
Proposed time frame:	Month 1 – Month 96

8.4.9.1.2 Environmental certification

In the recent years many ports started implementing environmental management system (EMS) which is a systematic approach to manage a port's environmental programs for pollution prevention, protection and control. The most successful port (currently for seaports only) environmental initiative on European soil is "EcoPorts"[43]. EcoPorts is the main environmental initiative of the European port sector. It was initiated by a number of proactive ports in 1997 and has been fully integrated into the European Sea Ports Organisation (ESPO) since 2011. The overarching principle of EcoPorts is to raise awareness on environmental protection through cooperation and sharing of knowledge between ports and improve environmental management. EcoPorts provides two well-established tools to its members:

- Self-Diagnosis Method (SDM)
  - SDM checklist: identify environmental risks
  - SDM Comparison: compare your SDM score with the European average
  - SDM Review: receive expert's advice and personalized recommendations

- Port Environmental Review System (PERS, certificate assessed by Lloyds register)

These tools fit ports of different sizes and at different stages in the development of their environmental priorities.

Danube ports should cooperate on the development of their own and harmonized environmental certification tool and procedures, or investigate how the already available tools (such as EcoPorts, for example) could be adapted for the specific needs of Danube ports and related legislation, where applicable.

Proposed responsible organisation(s):	Port authorities, environmental authorities
Proposed duration:	84 months
Proposed time frame:	Month 13 – Month 96

8.4.9.1.3 Compulsory shore-side electricity supply for vessels

Shore-side electricity supply for vessel is an issue regulated, in the European Union, by the Directive 2014/94/EU on the deployment of alternative fuels infrastructure[44]. Shore-side

[43] https://www.ecoports.com
[44] Directive 2014/94/EU of the European Parliament and of the Council of 22 October 2014 on the deployment of alternative fuels infrastructure

electricity facilities can serve maritime and inland waterway transport as clean power supply, in particular in maritime and inland navigation ports where air quality or noise levels are poor. Shore-side electricity can contribute to reducing the environmental impact of sea-going ships and inland waterway vessels, that is, to minimize their air polluting sources while at berth. It refers to the provision of shore-side electrical power through a standardised interface to seagoing ships or inland waterway vessels at berths. Article 4(5) of the Directive foresees that Member States shall ensure that the need for shore-side electricity supply for inland waterway vessels and seagoing ships in maritime and inland ports is assessed in their national policy frameworks. Such shore-side electricity supply shall be installed as a priority in ports of the TEN-T Core Network, and in other ports, by 31 December 2025, unless there is no demand and the costs are disproportionate to the benefits, including environmental benefits. Currently, this article leaves the room for ports to determine whether the shore-side electricity supply is in enough demand or not, and if the costs are disproportionate to the benefits. Taking into account the ever stricter environmental rules and requirements, Danube ports should be proactive and make the shore-side electricity use as compulsory.

Proposed responsible organisation(s):	Port authorities, ministries of transport
Proposed duration:	84 months
Proposed time frame:	Month 13 – Month 96

8.4.9.1.4 LNG supply and bunkering stations for vehicles and vessels in ports

Use of LNG (liquefied natural gas) as an alternative fuel in inland waterway transportation is also regulated by the Directive 2014/94/EU on the deployment of alternative fuels infrastructure. This Directive states that a core network of refuelling points for LNG at maritime and inland ports should be available at least by the end of 2025 and 2030, respectively. Refuelling points for LNG include, inter alia, LNG terminals, tanks, mobile containers, bunker vessels and barges. The initial focus on the core network should not rule out the possibility of LNG also being made available in the longer term at ports outside the core network. The decision on the location of the LNG refuelling points at ports should be based on a cost-benefit analysis including an examination of the environmental benefits. Applicable safety-related provisions should also be taken into account. Even though there are no LNG fuelled inland vessels on the Danube at this moment, ports could anticipate the market and follow the examples of ports of Enns and Ruse where existing LNG fuelling stations for trucks are conveniently located along the waterside so that they could easily be used by vessels when a demand occur. Ports of Bratislava and Budapest have already commenced studies on LNG refuelling points deployment.

Proposed responsible organisation(s):	Port authorities, port operators, ministries of transport, LNG suppliers
Proposed duration:	96 months (and continues after the strategy period)
Proposed time frame:	Month 1 – Month 96

8.4.9.1.5 Electrification of port internal railways

In order to contribute to the overall efforts of greening of ports, an investigation should be undertaken in order to assess the feasibility of electrification of internal railways in ports in such way not to disturb the ship-to-shore operations and operations of other cargo handling equipment in ports.

Proposed responsible organisation(s):	Port authorities, port operators, rail operators, rail infrastructure companies, ministries of transport
Proposed duration:	72 months
Proposed time frame:	Month 13 – Month 84

8.4.9.1.6 Alternative powered handling equipment

Port authorities and port operators in the Danube region should assess the viability of introducing alternative powered handling equipment, in order to minimize the use of fossil fuels for the cargo handling equipment. Currently, the manufacturers of cargo handling equipment offer LNG fuelled forklifts, electric forklifts, hybrid and LNG fuelled reach stackers, straddle carriers, terminal tractors, etc. Therefore, there are already available solutions and port authorities should consider systems of incentives for port operators willing to switch to alternative fuelled cargo handling equipment.

Proposed responsible organisation(s):	Port authorities, port operators, ministries of transport, equipment suppliers
Proposed duration:	84 months
Proposed time frame:	Month 1 – Month 84

8.4.10 Objective 10: Focus on multimodality (by offering a wide range of road and rail services in port areas)

"Ports are more than piers" philosophy is applied here. In order to boost multimodality and increase their cargo throughput, ports need to put focus on extending the range of services for road and rail transport. Moreover, multimodal terminals provide a buffer between the different capacity and frequency of the transport modes they connect. For example, a steel coils carrying ship can call at a port once a week to ship the coils for export, while trucks carrying coils can arrive at a port every hour or even more frequently. Facilities and services enabling a faster turnaround of trucks and wagons will attract more users towards a multimodal terminals located in ports.

8.4.10.1 Implementation measures

8.4.10.1.1 Attract road and rail operators to use ports as their hubs by incentivizing them or through attractive pricing schemes

Road and rail operators usually take over and deliver cargo in determined terminals, which are, or should be multimodal by nature, so as to enable easy or direct transfer of cargo from one mode to another or delivery of cargo for further processing. Moreover, cargo terminals, or cargo hubs are also used for the preparation of cargo for further use in the transportation process, supply chain and even production or distribution. In addition, creation of attractive

conditions for road and rail operators is likely to increase the volume of land-to-land cargo in ports. In this view, ports should investigate ways on how to attract more rail and road operators to use the terminals located in ports, even in cases when cargo is not transhipped to/from ships.

Proposed responsible organisation(s):	Port authorities, port operators, road and rail operators, ministries of transport
Proposed duration:	84 months
Proposed time frame:	Month 13 – Month 96

8.4.10.1.2 Make infrastructure adjustments facilitating intermodal operations

Infrastructure requirements for intermodal and multimodal terminals vary from port to port, from terminal to terminal. If a typical contents of an intermodal terminal could be defined, it would be similar to the following[45]:

- one – or better double-sided rail access, where
- signalling allows for entry with momentum and direct departure of the train by the main line traction unit,
- three to five "train long" (length can vary between countries) handling or transhipment tracks, with rail-mounted gantry cranes (RMG),
- two to three interim storage or buffer lanes,
- one loading and one driving lane,
- road side access with
- check-in / check-out area (gate) and sufficient parking space,
- 4 transshipment tracks up to 700 m each,
- 2 gantry cranes,
- 1 road lane for trucks,
- 1 road lane for loading and unloading of trucks,
- 4 lanes for intermediate buffer of loading units,
- 2-4 railway sidings to ensure multiple use of transshipment tracks.

Nevertheless, the quoted source obviously took into account only road-rail bi-modal terminals. For this reason, the facilities for real intermodal (tri-modal) terminals to be added to those listed above should include:

- at least one shore-side track for loading block trains (up to 700 m each),
- shore-side road lane for loading/unloading of trucks,

[45] http://www.intermodal-cosmos.eu/content/intermodal-transport-in-south-east-europe/intermodal-basics/intermodal-terminals/index_eng.html

- gantry cranes capable of handling cargo over the quay wall and between the span of the crane "legs".

Needless to say, the exact facilities need to be determined on a case to case basis by each port.

Proposed responsible organisation(s):	Port authorities, port operators, ministries of transport, rail infrastructure companies, rail operators, road transport companies.
Proposed duration:	84 months
Proposed time frame:	Month 13 – Month 96

8.4.11 Objective 11: Prepare mitigation measures to combat market volatility, seasonal effects and unpredictability

It is a known fact that transport in general involves a great deal uncertainties and that is subject to volatility of different market segments, including seasonal effects. Ports are, naturally, no exception to this. All these uncertainties, unpredictability, market volatility and seasonal effects have a crucial negative influence on port effectiveness and efficiency. Consequently, the commercial success of port operators is also affected by these phenomena. None of these phenomena can be avoided or neutralized in its entirety, but adaptive or mitigating measures can be taken in order to minimize their negative effects.

8.4.11.1 Implementation measures

8.4.11.1.1 Diversify services and focus on multipurpose terminals for non-sensitive goods

Service diversification is a usual practice, especially in small ports with low throughput of specific cargo, but a high throughput of total cargo quantities. In this view, entire ports or certain port terminals in slightly larger ports, can opt to develop multipurpose terminals that can handle multiple types of cargos, usually the non-sensitive cargoes, like, for example, coal and ore, or general break-bulk cargo. This, of course, is an antipode to port specialization and deserves due attention when such decisions are to be taken and when, for whatever reasons, port specialisation is not an option. Multipurpose ports/terminals are more fit for areas where distances between two adjacent ports is more than 100 km.

Proposed responsible organisation(s):	Port authorities, port operators
Proposed duration:	84 months
Proposed time frame:	Month 19 – Month 96

8.4.11.1.2 Develop a concept of "flexible inland port"

A flexible inland port is a port which has a high degree of adaptability to changing or changed market conditions and cargo forecasts that were used during the planning stage of a port or during a preparation of its development plan after years of operation. In short, a flexible port is a port capable to successfully deal with uncertainties. A very interesting concept of flexible

port is presented in a doctoral thesis defended at the Delft University in 2013[46]. The author presented a framework within which the flexibility of port infrastructure systems was identified and incorporated. First, a port is presented as a three-layer infrastructure model. The model has three specific layers: a physical infrastructure layer, an operational layer, and a services layer.

Figure 12: Three-layer port infrastructure system

(Source: Taneja, P.)

Thereafter, the author developed various flexibility options in each layer, listed in Table 28 below.

Table 28: Flexibility options for different layers of a port system

Layer	Sub-level	Flexibility
Layer 1	*Physical infrastructure* Provide flexibility in design and layout	• provide reserves for expansion • design robust infrastructure • design flexible infrastructure • design mobile infrastructure
	Decision making related to physical infrastructure Seek alternatives to project	• do nothing • increase efficiency • influence policy • shape demand (campaigns) • diversify
	Start new project	• invest • abandon • defer/phase/ speed up
	Plan (realize) new project	• set up flexible specifications • set up flexible selection criteria • allow design alternatives during procurement • set up flexible constructic contracts

[46] Taneja, P. (2013), *The Flexible Port*, PhD Thesis, Delft University, The Netherlands

Layer	Sub-level	Flexibility
Layer 2	*Operations/procedures* Institutional environment	• set up a flexible organization • set up flexible custom procedures • set up flexible labour regulations • set up flexible operating procedures • set up flexible operating scale
	Project configuration	• set up flexible specifications • set up flexible selection criteria alternative • apply for subsidies and exemptions • include incentive- or penalty clauses • handle risk through allocation & transfer or hedges insurance • involve financiers • form partnerships with suppliers/contractors • form alliances/coalition with operators • form alliances/coalition with affected parties
	Concessions	• set up flexible specifications • set up flexible port tariff structure • include demand guarantees
Layer 3	*Products and services* Cargo	• diversify as to cargo type • scale expansion/new investment
	User	• multi-user facilities
	Function	• multi-functional facilities
	New function	• manager/real estate developer

(Source: Taneja, P.)

Following the above example for seaports, Danube ports should investigate the options for the conceptualisation for "flexible inland ports" from the planning stage of new ports to the phases of operation and concessions of existing ports. This investigation is very complex and requires significant efforts in time and resources and thus is suitable for submission, as a project, for co-funding from appropriate EU funds.

Proposed responsible organisation(s):	Port authorities, ministries of transport, port operators
Proposed duration:	36 months
Proposed time frame:	Month 13 – Month 48

8.4.11.1.3 Develop a concept of "flexible" concessions

Regardless of the type of the concession, the contracts regulating concessions should be flexible enough to maintain a win-win solution for both public and private party.

With the changing environment, the need has arisen for concession agreements to adapt to new societal, environmental and technical conditions that cannot be foreseen at the time of contract signature – moreover, concessions have to adapt to innovations and new trends in asset management.

In many instances, the contracts are not flexible enough to allow their adaptation to reality. In many jurisdictions there are legal challenges to the concession because the legal framework in effect does not deter challenges and allow for their prompt resolution with unpredictable consequences.

The two main areas requiring flexibility in concessions are as follows:

- *Technical*: Adaptable performance-based indicators that incorporate mechanisms promoting innovation and well define the level of service in different phases of the asset, construction, operation and also at the end of the concession
- *Regulatory*: Regulation of concessions varies greatly throughout their duration and depending on jurisdiction. A simple solution is to embed clauses of progress that guarantee both value for money and the economic and financial balance of the concession.

Furthermore:

- *Political*: Concessions signed by previous governments creates uncertainties for the private operators – responsibility for executing concession agreements should be embedded with independent PPP units with know-how of infrastructure and is well-resourced – should be politically impartial.

Proposed responsible organisation(s):	Port authorities, port operators, ministries of transport, ministries of economy, ministries of finance
Proposed duration:	48 months
Proposed time frame:	Month 25 – Month 72

8.4.11.1.4 Explore advantages of mobile cranes instead of quay-track mounted cranes

As the useful life of many existing portal cranes in the Danube ports is nearing its end or has, theoretically, ended (cranes in some ports are more than half a century old, and some even date back to pre-WWII period!), many port authorities and port operators need to consider replacing such cranes. Since portal cranes' autonomy is rather limited due to the fact that they need quay tracks in order to move along the quay, ports may consider procurement of mobile cranes due to their increased autonomy in mobility and their versatility. Mobile cranes (wheel mounted or crawlers) provide versatile and economical handling of any cargo, serving every type and size of vessel in any kind of terminal. Thanks to their flexibility, they can be easily moved from one terminal to another, without disrupting the operations of other cranes.

Proposed responsible organisation(s):	Port authorities, port operators
Proposed duration:	60 months
Proposed time frame:	Month 1 – Month 60

8.4.12 Objective 12: Use modern technologies and digitisation to reduce bureaucracy and increase efficiency

Evolve or disappear – an ongoing process in nature is perfectly valid for ports as well. So called "old school" of thinking like "why would we change anything that has been functional for decades, perhaps a century" is still a great burden to innovation and minimization of bureaucracy. Inland waterway transport, along with inland ports, especially in the Danube region, is rather inert in taking up innovations. Just as an example, River Information Services were successfully introduced in the Danube region to a large extent thanks to the so called EU RIS Directive[47], but not without resistance and subsidies for the equipment installed on board. Fortunately, that situation is, we dare to assume, changing. However, in order to keep the pace with other modes of transport which take up innovations much faster, inland ports must evolve or lose the race with ever advancing rail and road terminals. Thus, Danube ports should share the know-how more openly and use or employ highly skilled professionals in order to reduce bureaucracy and consequently increase efficiency of the administrative part of work in ports which often has crucial influence on physical operations on quays or in handling yards and storage areas.

8.4.12.1 Implementation measures

8.4.12.1.1 Use Port Community Systems

Port Community System, according to a definition[48] of International Port Community System Association (IPCSA) is a "neutral and open electronic platform enabling intelligent and secure exchange of information between public and private stakeholders in order to improve the efficiency and competitive position of the sea and airports' communities". This definition is perfectly valid for inland ports as well.

Port Community System (PCS) is aimed at optimisation, management and automation of smooth port and logistic operation via a single submission of data and by connecting transport and logistic chains. Advanced and fully operational PCS include the community which, in many cases, includes the shareholders of the PCS Operator. For this reason, it is said that PCS are formed by the community for the community. PCS greatly reduces inefficiencies in port business processes, reduces delays in cargo movements through enhanced data exchange, facilitates the smooth flows of electronic data and enables compliance with the national and EU directives.

[47] Directive 2005/44/EC of the European Parliament and of the Council of 7 September 2005 on harmonised river information services (RIS) on inland waterways in the Community

[48] https://ipcsa.international/pcs

Port Community System deals with electronic communication in ports between the private transport operators (shipping lines, agents, freight forwarders, stevedores, terminals, depots), the private hinterland (pre- and on-carriage by road, rail and inland waterways in case of seaports), the cargo importers and exporters, the port authorities, Customs, Immigration and other involved authorities.

Typical services of a Port Community System are:

- information exchange between transport operators in the port and for hinterland connections, the port users, Customs, port and other authorities,
- electronic exchange of Customs declarations and Customs responses, and cargo releases between private parties and Customs,
- electronic handling of all information regarding import and export of containerized, general and bulk cargo for the port community,
- status information and control, tracking and tracing goods through the whole logistics chain, and
- processing declarations of dangerous goods with the responsible authorities.

One of the most useful functions of a Port Community System is to automatically derive, from information exchanges between the private port operators, that information needed by Customs, such as the Customs manifest or the Customs declaration. This information can then be sent to Customs without further manual intervention. Most Port Community Systems have their own internal standards but communicate with other Port Community Systems or Trade Communities using international standards, in particular those developed by UNECE-UN/CEFACT[49].

The European Port Community Systems Association (EPCSA[50]) has also published a white paper EPCSA White Paper - Issue Date 15th June 2011-2[51], on national maritime Single Windows, which need to be established in the EU, and which follow the IMO[52] recommendations on maritime Single Windows. These recommendations are not directly transferable to inland ports (in fact, no standards or recommendations for inland ports PCS were found during the elaboration of this study), but can be used as good practice guidance and adapted to specific conditions prevailing in inland ports and inland waterway transportation.

Proposed responsible organisation(s):	Port authorities, ministries of transport, Port community system (PCS) operators
Proposed duration:	96 months (and continues)
Proposed time frame:	Month 1 – Month 96

[49] http://tfig.unece.org/contents/unece-uncefact-recommendations.htm
[50] http://www.epcsa.eu/
[51] http://tfig.unece.org/pdf_files/A9R149C.pdf
[52] http://www.imo.org/en/Pages/Default.aspx

8.4.12.1.2 Exploit RIS based technologies for port operations planning

River Information Services (RIS) can easily be used for more effective port operations planning. RIS for ports and terminals include, inter alia, the provision of Estimated Time of Arrival (ETA) updates and reliability time windows. Such RIS services support inland and sea ports on e.g. berth operations, resource management as well as port dues collection. Danube ports should launch a project which would deliver a harmonized but modifiable/adaptable RIS based tool for port operations planning.

Proposed responsible organisation(s):	Port authorities, port operators, RIS operators
Proposed duration:	For example: 48 months
Proposed time frame:	For example: 1 – Month 48

8.4.12.1.3 Harmonize ship and cargo document requirements

Ship, cargo, crew and passenger documents are needed in inland waterway transportation whenever a vessel stops at border control point (border crossings) and at ports. Different authorities require different documents and most of them are in different forms, sometimes even in free form every time a vessel calls a port or border crossing. International standardization and harmonization is much needed since the captains of inland vessels sometimes need to prepare and hand over to agents or authorities hundreds of copies of different documents throughout the voyage.

Harmonisation of documents in inland waterway transportation in the Danube area is in its infancy. For now, only a few documents are being harmonized. The EUSDR joint working group between Pa1a/Pa11 was established aiming to simplify (avoid duplication /multiplication of work for ship crews), harmonize (International standardisation of data requests, forms and processes) and digitalize (Impulses for transparent, effective and efficient border control procedures) of the required measures for improved border controls.

DAVID forms - Danube Navigation Standard Forms – is the key output of the cooperation of the Pa1a/Pa11 joint group with regard to standardized and harmonized documents that are accepted in all countries. The first set of DAVID forms (Danube Navigation Standard Forms) were already aligned.

The DANTE project[53] closely cooperated with the EUSDR Priority Area 1a – Pa1a (inland waterways) in order to continue and capitalize the works of the relevant working groups and has a broader focus with more diverse topics, using a state-of-the-art reporting tool to collect information on procedural barriers directly from the stakeholders of the IWT and national working table meetings as a platform to identify administrative barriers.

The first set of DAVID forms (Danube Navigation Standard Forms):

- arrival and departure report;

[53] http://www.interreg-danube.eu/approved-projects/dante

- crew list;
- passenger list.

Second phase of unified documents dealing with health, dangerous goods and nautical controls (support the database concept) developed within the P1a1/Pa11 joint group.

Already performed and planned activities within the framework of Pa1a/Pa11 joint group regarding the standardized and harmonized documents mutually recognized and accepted by the border control authorities shall be followed closely as their results will provide an environment for smooth and fast border controls.

As a result, the standardized and harmonized documents for border controls will improve competitiveness of the IWT, having a positive economic impact and providing more environmentally friendly services as a result of reduced time for border controls.

In harmonization of the documents used in ports, a lot can be learned from the Convention on Facilitation of International Maritime Traffic (FAL)[54]. The Convention's main objectives are to prevent unnecessary delays in maritime traffic, to aid co-operation between Governments, and to secure the highest practicable degree of uniformity in formalities and other procedures. In particular, the Convention reduces the number of declarations which can be required by public authorities. In its Annex, the Convention contains "Standards" and "Recommended Practices" on formalities, documentary requirements and procedures which should be applied on arrival, stay and departure to the ship itself, and to its crew, passengers, baggage and cargo.

The Convention defines standards as internationally-agreed measures which are "necessary and practicable in order to facilitate international maritime traffic" and recommended practices as measures the application of which is "desirable".

The Convention provides that any Contracting Government which finds it impracticable to comply with any international standard, or deems it necessary to adopt differing regulations, must inform the Secretary-General of IMO of the "differences" between its own practices and the standards in question. The same procedure applies to new or amended standards.

In the case of recommended practices, Contracting Governments are urged to adjust their laws accordingly but are only required to notify the Secretary-General when they have brought their own formalities, documentary requirements and procedures into full accord.

This flexible concept of standards and recommended practices, coupled with the other provisions, allows continuing progress to be made towards the formulation and adoption of uniform measures in the facilitation of international maritime traffic.

[54] http://www.imo.org/en/OurWork/Facilitation/ConventionsCodesGuidelines/Pages/Default.aspx

Standard 2.1 lists the documents which public authorities can demand of a ship and recommends the maximum information and number of copies which should be required. IMO has developed Standardized Forms for seven of these documents. They are the:

- IMO General Declaration
- Cargo Declaration
- Ship's Stores Declaration
- Crew's Effects Declaration
- Crew List
- Passenger List
- Dangerous Goods declaration

The work of Pa1a/Pa11 joint group, accompanied with the necessary shipping and port experts should be continued in any available form with the final goal of introduction of the shipping and port documents in a harmonized way. If the 123[55] countries of the world, with countless different legal systems and practices ratified the FAL convention, there should be no excuse for the Danube countries to do the similar for their own purposes. Quite logically, the initiative for such convention/agreement can also come from the EC, in order to cover the entire inland waterways network in Europe.

Proposed responsible organisation(s):	Port authorities, national governments, customs, ministries of interior, DPN, ship operators.
Proposed duration:	48 months
Proposed time frame:	Month 1 – Month 48

8.4.12.1.4 Investigate possibilities for IWT/Port Single Window Systems and paperless document processing

In order to ensure competitiveness and efficiency of inland waterway transport it is necessary to reduce the administrative burden on ships and to facilitate the use of digital information with the aim of improving the efficiency, attractiveness and environmental sustainability of the inland waterway transport and contribute to the integration of the sector to the digital multimodal logistic and even supply chains.

The issue of Single Windows Systems is far more advanced in the maritime transport, and those developments can be a good guidance for the implementation of Single Windows in IWT and inland ports.

First, an attempt to introduce the National Single Windows was made[56]. On 20 October 2010, the European Parliament and the Council adopted Directive 2010/65/EU[57] on reporting

[55] http://www.imo.org/en/About/Conventions/StatusOfConventions/Documents/StatusOfTreaties.pdf
[56] https://ec.europa.eu/transport/modes/maritime/digital-services/e-maritime_en
[57] Directive 2010/65/EU of the European Parliament and of the Council of 20 October 2010 on reporting formalities for ships arriving in and/or departing from ports of the Member States and repealing Directive 2002/6/EC

formalities for ships arriving in and/or departing from ports of the Member States. This directive is more commonly known as the *Reporting Formalities Directive* (RFD).

The objective of the RFD is to simplify and harmonise the administrative procedures applied to maritime transport and it sets an obligation for Member States to establish National Single Windows (NSW) for reporting formalities from ships arriving in and/or departing from ports by 1 June 2015 for the 14 reporting formalities listed in the Annex of the RFD. The information should be submitted *electronically* and only once thus removing the need of submitting same or similar information separately to different authorities. Furthermore, the Directive requires that the *reporting formalities are requested in a harmonised manner in all ports* within an EU country.

In order to assist in the implementation of the RFD, the Commission established an expert group on maritime administrative simplification and electronic information services - known as the eMS group - with a mission to identify business processes and develop specifications for the NSWs. The group was composed of representatives from the national maritime administrations. Additionally, the industry representatives have been invited to the meetings as observers. The European Maritime Safety Agency supported the Commission during the eMS group meetings and was actively contributing to the drafting of the functional, technical and testing specifications.

A number of different authorities and services such as transport, customs, border control, safety, security, health and environment have been participating to the work of the eMS group to produce the single window definition, harmonised business rules and the unique NSW data set aligned with regulatory requirements and existing standards. Over the time this work has been merged to produce the National Single Window Guidelines document.

In 2016, the Commission launched a REFIT evaluation of the RFD together with the VTMIS Directive. The outcome of the support study leads to the conclusion that the objectives of the RFD were not (or only partially) attained:

- Paper reporting is still used to a certain extent in more than 50% of ports, often as duplication;
- Reporting is only fully digitalised and harmonised only in a few EU countries;
- True single window submits only-once reporting is available only in a few EU countries;
- The information is seldom shared and re-used, notably between EU countries;

Furthermore, not enough progress has been made on the EU level harmonisation - all NSWs implemented are different. Therefore, the positive impact of National Single Windows is small, sometimes even negative for the shipping industry.

The Member States and the industry are requesting the Commission to act urgently. On 29 March 2017, the EU Transport Ministers underlined in the "Valetta Declaration" the shortcomings of the Reporting Formalities Directive and invited the Commission to propose

a follow-up to the evaluation of the RFD, which would include a harmonised European Maritime Single Window environment. In their joint statement on 1 March 2017, major EU shipping associations urged the EU to launch a fundamental overhaul of the Reporting Formalities Directive with a view to create a true European Maritime Single Window environment. The Valletta Declaration was endorsed by the Council of the EU on 08 June, 2017.

Considering the perceived limitations of the RFD and the NSWs, there is a need to move towards a genuine and *harmonised European Maritime Single Window* environment, containing amongst others the following characteristics:

- Fully harmonised interfaces available to ship operators to provide information in the same way and format across the EU.
- A standardised maximum data set including the information necessary for the management of port and port terminals in order to ensure true submit-only-once. Any relevant data already provided to authorities should be made available and not be required again.

Another initiative worth exploring in inland waterway transportation and inland ports is the so called “eManifest initiative”. This initiative refers to the idea of a harmonised and electronic manifest and has received wide support in Member States.

Following the Blue Belt initiative, the idea of a harmonised and electronic manifest has received wide support.

Early 2016, DGs MOVE and TAXUD, together with the European Maritime Safety Agency, launched the eManifest pilot project. The overall objective of the project is to simplify the submission of data elements required by both maritime and customs authorities using a harmonised cargo data set, with the aim to reduce administrative burden for ship data providers. Individual data elements should be submitted in a standardised format to the relevant authorities and not asked separately.

A project group was established consisting of the Commission services, EMSA, representatives of maritime and customs authorities of 13 Member States and of the industry associations.

The use of a harmonised eManifest should follow the principle established in the Reporting Formalities Directive that parties involved in trade and transport should be able to lodge standardised information and documents via an electronic single Window to fulfil reporting formalities. EMSA has developed a European Maritime Single Window prototype to test feasibility and possible technical solutions.

The harmonised eManifest data set will be compliant with the EU Customs Data Model and as well as with the World Customs Organisation (WCO) Data Model.

It is worth noting that PCS has the ability to act as a National Single Window or to integrate into a National Single Window which European Member States are developing in response to recent Directives and policy from the European Commission. Port Community System is therefore pivotal in the Single Window concept and will reduce duplication of data input through efficient electronic exchange of information.

Before proceeding towards the development of National Single Windows or European Single Windows for inland waterways transportation including ports, Danube ports should sit together with the shipping industry, cargo exporters and importers, shipping agents, forwarders and public authorities (such as Customs, immigration, police, harbour master offices, etc.) and agree on how to harmonize the ship, crew, port and cargo documents used in inland waterway transportation and inland ports.

Already mentioned DAVID forms can easily be exchanged in electronic version and thus facilitate the PCS or any other Single Window tools.

Proposed responsible organisation(s):	Port authorities, port operators, customs, ministries of transport, ministries of economy, ministries of interior, ministries of finance, DPN
Proposed duration:	60 months
Proposed time frame:	Month 13 – Month 72

8.4.13 Objective 13: Create redevelopment policies to optimize the facilities and available space

One of the aspects of "flexible port planning" is the ease with which a port master plan or a port development plan can be altered and adapted to new situations. Flexible land planning, coupled with flexible capacity planning, is one of the most important keys towards the efficient port. Historic trends (5-10 years) as well as regularly updated forecasts of cargo flows and commodity trends are the crucial inputs for the flexible planning which is a basis for redevelopment and optimisation policies in ports. Some ports in the Danube region have vast space for development, whereas others have very little or no space at all for development (Figure 13).

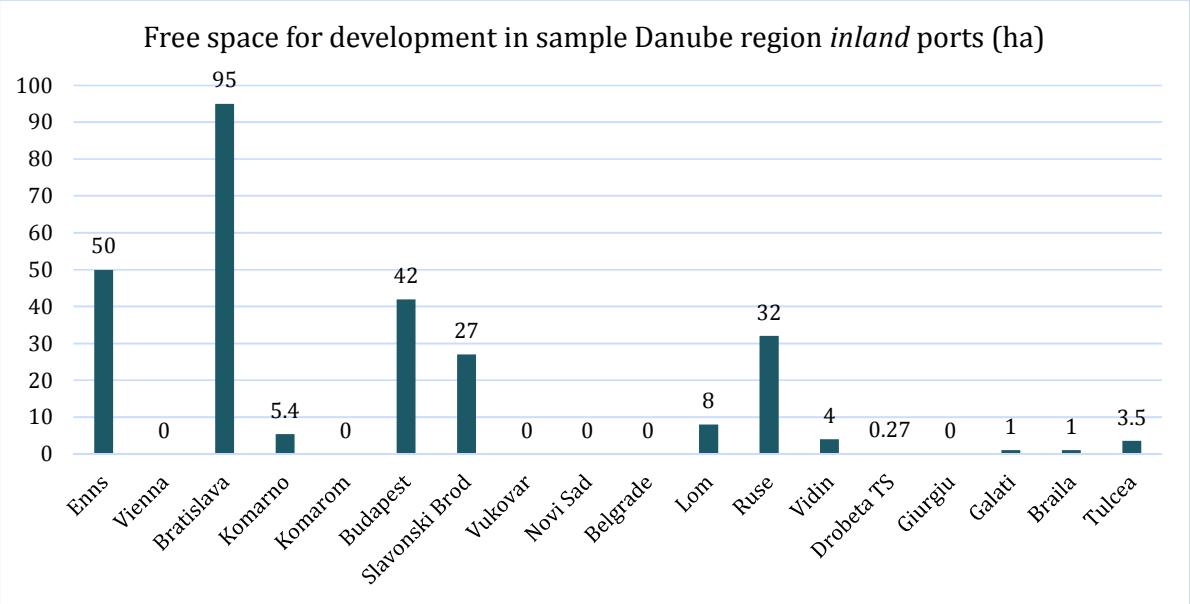

Figure 13: Free space for development in sample Danube region inland ports

(Source: iC consulenten)

Those ports with vast but development area which were not used for many years may reconsider their development policies, optimize their land slots and assess the possibilities of creating the hybrid logistic zones in the excess space. On the other hand, there are ports which have virtually no development space. Seaports with similar problems often opt for "stealing" the land from the sea, but this option may be very problematic for inland ports which, by their nature, have very limited waterfronts. In some cases, these ports need to recover the land from their own port basins, by reducing the water surface in the port basins and fill the area with land (e.g. Linz, Vienna, etc.). By recovering the land from port basins, these ports have reduced physical space for vessel berthing, but they have modernized and optimized their handling equipment and provided the same vessel throughput with a lower number of berths. The land recovery from port basins in inland ports may also be a result of a growing traffic on a land-to-land side of the port. All these options need to be planned well in advance, but at the same time to keep the flexibility to scale up or scale down the plans.

8.4.13.1 Implementation measures

8.4.13.1.1 Diagnose and locate overcapacities and optimize available space for diverse port and logistic functions

Re-engineering of port operations and analysis of utilization rates of any of the productive elements of the port system (berths, cranes, handling yards, storages, warehouses, reception/delivery area for trucks and trains, loading/unloading spaces for trucks and wagons, etc.) is necessary in determined time periods. This re-engineering process forms a part of the so called continuous dynamic port planning and is in the core of the flexible port model. Danube ports should consider using this process either with internal or external

sources every 3 to 5 years. This process can precisely identify deviations in capacities (undercapacities or overcapacities). In case of overcapacities, especially in surface areas, any excess spaces can be used for redevelopment and attraction of any of the elements forming hybrid logistic zones.

Proposed responsible organisation(s):	Port authorities, ministries of transport, spatial planning authorities
Proposed duration:	48 months
Proposed time frame:	Month 1 – Month 48

8.4.13.1.2 Optimize and/or modernize handling equipment

This measure is in close relation with the measure "Explore advantages of mobile cranes instead of quay-track mounted cranes" in Objective 11. The finite resource of port land may be used in a more appropriate way if handling equipment is optimized or modernized. Mobile equipment with higher capacity and higher loading/unloading speeds can reduce the space being used for waiting trucks or trains, and even for the transit storages. Logically, such equipment can greatly increase the efficiency of port operations and reduce the turnaround time of vessels and vehicles in ports. In this view, the Danube ports should prepare a plan for the overall modernization of the handling equipment together with the current or prospective port operators and seek for funding options from the community funds.

Proposed responsible organisation(s):	Port operators, port authorities, ministries of transport, ministries of finance
Proposed duration:	36 months
Proposed time frame:	Month 1 – Month 36

8.4.14 Objective 14: Create long-term port strategies using skilled professionals and cooperation/networking possibilities

The lore "United we stand, divided we fall" has demonstrated its justification in the Daphne project where ports stood together to protect their own interest and work for their common good. Their voice was heard far, and is yet to be heard. Long-term strategies, especially those involving the entire Danube region ports, were scarce and rarely moved from paper to reality. The project Daphne, and the Danube Ports Network as one of its outcomes proved that the commitment of ports and dedication of joint teams can provide real and tangible results, not just paper projects that collect dust on shelfs. For this reason, the Danube ports are encouraged to continue working on their own strategies, both common and individual and use them as a foundation for further development of the entire network of ports in the Danube region.

8.4.14.1 Implementation measures

8.4.14.1.1 Formulate flexible strategies and provide regular updates

Development strategies, both on common and individual levels should be flexible enough to be updated regularly, when old challenges are no more, and when new ones require attention

and action. The Danube Port Development Strategy and Action Plan is elaborated in such way to enable easy updates and addition or removal of objectives and implementation measures in a modular way. Therefore, the current strategy, as well as the national/individual ones should be updated bi-annually or less frequent, depending on the common agreement. Regular meetings with specific topics on port strategy and port development should be held under the auspices of the Danube Port Network. Meetings should be used for knowledge sharing on the latest news in the development of the Danube ports and supranational policies and strategies affecting the governance, management and operation of ports, and, consequently, for the update of the strategy and taking adequate actions.

Proposed responsible organisation(s):	Port authorities, port operators, DPN
Proposed duration:	48 months
Proposed time frame:	Month 1 – Month 36, Month 56 – Month 61, Month 79 – Month 84

8.4.15 Objective 15: Join forces for common cause in port and shipping development

Past decades proved that the Danube region ports have similar and common challenges and issues to be solved in order to increase their efficiency, attract more cargo to ports and to enable ports to become irreplaceable nodes in the transport network and crucial elements of the supply chains. In addition, specific economic and geo-political situation on the Danube gave a special "touch" to the issues of interest for Danube ports, making them somewhat different from the challenges with which inland ports in Western Europe are faced. For this reason, a creation of a regional association gathering port authorities and port operators from the Danube region was agreed. The Danube Ports Network will be a new player in policy advocacy, lobbying, information service provision as well as in project related activities especially with regard to those which try to retrieve funding from European programs. In its start-up phase, the network has to gain awareness from the internal and external audiences which shall be target groups for various communication activities. Therefore, the structured identification and start of interaction with key stakeholders of the target groups will be a major part of the work of the network

8.4.15.1 Implementation measures

8.4.15.1.1 Create functional and active association for port networking

Following the creation of the Danube Ports Network, a quick move from plans to action will be needed in order to face the new challenges. Members of the network will have to turn their attention to the development of joint projects and joint activities. This is the network getting down to daily business and marks a significant transition from a focus on network building to project and activity development and implementation.

Major next steps in this phase should include[58]:

[58] Group of authors (2018), *Financing model and Business plan of the Danube Ports Network*, Daphne project, WP6, Deliverable 6.2.3

- Initiate and implement projects of common interest for the DPN partners
- Identify available financial resources (EU funding, national sources etc.)
- Set-up of port statistics services (data collection, and production) in cooperation with network partners (through the setting -up of dedicated Working Group) and via donau (Danube Ports platform).

Proposed responsible organisation(s):	Port operators, port authorities, ministries of transport, DPN
Proposed duration:	36 months (for full establishment, later continuous)
Proposed time frame:	Month 1 – Month 36

8.4.16 Objective 16: Optimize port development and capacity through pricing

Many ports in the world, or at least those with flexible administration systems, are using pricing systems to optimize their capacity or utilization. In certain cases, dynamic pricing systems are convenient to solve the problem of congestion, when diverting part of the traffic to adjacent ports cannot do any long-term damage to port's business. In other cases, when utilization degree of the port's facilities is very low and capacity is unused, dynamic pricing system can be used to attract additional traffic to port. Many ports are using the pricing schemes which are based on cost recovery principles or on marginal cost pricing. Unfortunately, the level of pricing innovation take-up in the Danube-based IWT in the region is very low and the entire industry has been very inert for decades. For this reason, it is necessary to investigate further the applicability of alternative pricing systems in in inland ports on the Danube. For example, dynamic and cost recovery pricing systems can be applied both in those fees charged by the public sector (port authorities and similar organisations), which usually refer to the infrastructure fees, and in those fees charged by the private sector (port/terminal operators, etc.) which include fees for most of the commercial services provided by operators. Last, but not least, in an attempt to apply the "same river, same rules" principle in port pricing should be investigated for the reasons of better and smoother planning of transport and supply chains.

8.4.16.1 Implementation measures

8.4.16.1.1 Investigate and assess the impact of different pricing systems as tools for port and hinterland development and capacity optimisation

First, a detailed overview of pricing principles and schemes, with the focus on their application to infrastructure and commercial services needs to be elaborated. For this purpose, a thorough review of relevant academic and professional literature will be made. Second, an inventory of existing costing and pricing practices in Danube Region ports should be prepared, accompanied with the questionnaires for port authorities, port operators and port users on the flexibility and adequacy of currently applied pricing schemes and their opinion on any alternative pricing schemes. Questionnaires should be accompanied with active involvement of port stakeholders (authorities, operators, users, etc.) through stakeholders' meetings. Third, the impact of alternative (user-pays, cost based, dynamic, marginal cost, etc.) pricing schemes should be assessed and checked for applicability in Danube ports, as a tool for port

and hinterland development and increase of the overall efficiency. Finally, a possibility of an application of a uniform pricing system in the Danube region will be investigated using the bottom up approach.

Proposed responsible organisation(s):	Port authorities, port operators, ministries of transport
Proposed duration:	36 months
Proposed time frame:	Month 1 – Month 36

8.4.17 Objective 17: Rehabilitation of port facilities in order to lower the logistic costs and keep the industries in or near ports

This objective refers mostly to the rehabilitation of the outdated quay walls. Operational quay walls (those used for ship-to-shore cargo handling) in many ports are not always vertical. In port operations technology, vertical quays are often seen as a preferred way of quay wall layout for inland ports, in spite of the higher costs of their construction when compared to the old fashioned sloped (inclined) quay walls. Although relatively cheaper to construct, sloped (inclined) quay walls operations are very dependent on water levels. The lower the water level, the longer the reach of a crane loading/unloading a vessel. This flaw is especially important for portal or jib cranes as their lifting capacity decreases with the reach. This significantly slows down the operation of loading/unloading. On the contrary, vessels berthed along the vertical quay are always at the same distance from the crane vertical axis thus making the loading/unloading easier when the water levels are low. Based on these facts, it can be reasonably stated that the ports with longer length of vertical quays are technologically more advanced than those ports still using the sloped quay walls and that their logistic costs can be lower. Figure 14 demonstrates the share of vertical quay length in total quay length in all ports under analysis in Daphne project. For this reason, the rehabilitation/reconstruction of sloped quay walls into vertical quay walls is an objective for all Danube ports not having 100% of their operational quays constructed as vertical.

Moreover, port areas in many ports reach deep inland, unlike those which are stretched along the river bank. Ports having sufficient land surface behind the operational areas (handling yards just behind the quay walls) should consider facilitating the so called “second row” land for industrial and/or logistic use, in order to optimize the land use in ports.

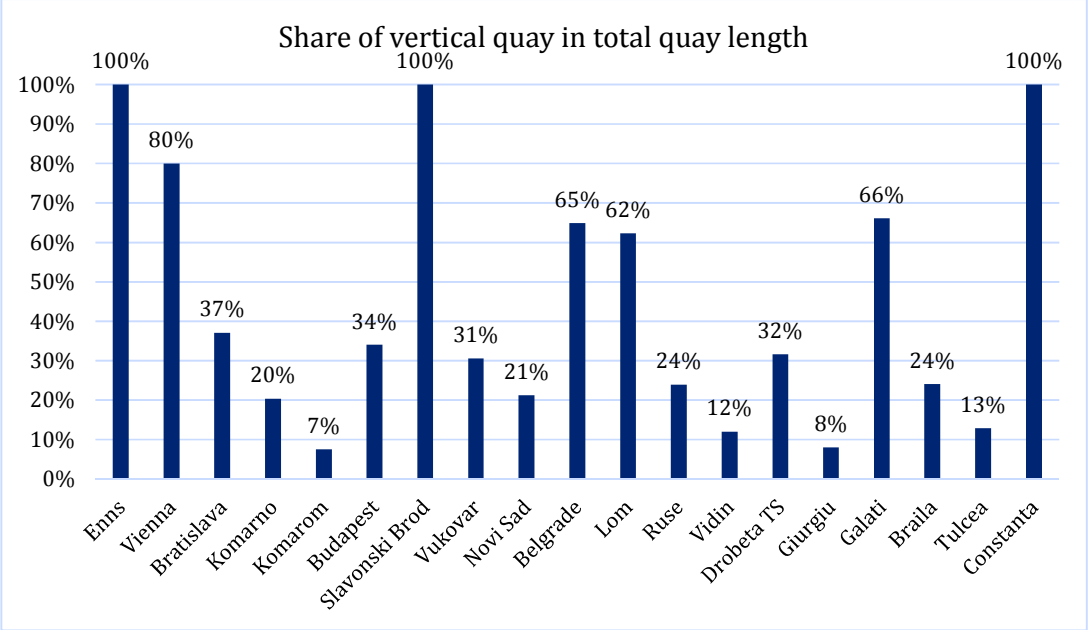

Figure 14: Percentage of vertical quay length in total quay length

(Source: iC consulenten, based on inputs from project partners)

8.4.17.1 Implementation measures

8.4.17.1.1 Reconstruct sloped quay walls into vertical ones

Ports wishing to participate in the rehabilitation/reconstruction activities should prepare the infrastructure projects in such way they are mature enough (ready for the works phase) and having a substantial impact on the economy and society. Thus prepared projects should be submitted for co-financing from relevant EU funds and/or through appropriate PPP schemes.

Proposed responsible organisation(s):	Port authorities, port operators, ministries of transport, ministries of finance
Proposed duration:	48 months
Proposed time frame:	Month 13 – Month 60

8.4.17.1.2 Facilitate of unused "second row" land for industrial and/or logistic use

Land use planning in ports should be adapted in such way to facilitate (from the legal and financial point of view) the so called "second row" land (usually the land slots more than 30-50 meters behind the quay wall and handling yards) for value added logistics and industrial (manufacturing) use. This measure could be implemented in close cooperation with the measures related with the creation of hybrid logistic zones in ports.

The parameter of optimised utilization of "second row" land can be the annual or monthly quantity of goods stored, warehoused, distributed, customs cleared, produced, packed,

labelled, logistically processed, etc. per each square meter of land used for such purposes. The higher the utilization, the more optimized land use of port areas. Nevertheless, great care should be exerted here, since too high utilization can cause problems related to internal traffic and cargo handling which, in turn, could cause congestion and inefficiencies.

Proposed responsible organisation(s):	Port authorities, spatial planning authorities, logistic operators, rail operators, rail infrastructure companies
Proposed duration:	48 months
Proposed time frame:	Month 37 – Month 84

8.4.18 Objective 18: Matching the demand and development plans and seek for realistic investment options

Overview of the relatively recent port master plans and development plans demonstrated that the national/regional economic development plans, and sometimes even spatial plans, did not include the port development plans or expansion needs, as well as the logistic and industrial bases for port activities. On the other hand, many port development plans did not take into account the national/regional economic development plans sufficiently or at all. As a consequence, an important gaps an occur in such cases. In the first place, this can cause inefficiencies in port operations, sub-optimal use of port lands and hinterland connection, sometimes even congestion. Second, national/regional economic development plans which do not properly include the port and transport development plans are virtually stripped off of important aspects facilitating sustainable growth. These gaps between the port and transport development plans on the one hand, and national/regional economic development plans on the other, also represent windows of opportunities for optimized growth and development on both sides of the port fence. This is why this "matchmaking" is necessary.

8.4.18.1 Implementation measures

8.4.18.1.1 Match the port planning with transport infrastructure and regional economic plans

Matching port planning with transport infrastructure and with Regional Economic Development Plans will deliver recommendations for their adaptations in line with sector priorities. National or regional economic development strategies, policies, programmes and plan will be analysed and compared with existing port planning documents. Overlapping and gaps should be identified and accompanied by relevant recommendations for matching.

Proposed responsible organisation(s):	Port authorities, port operators, DPN, spatial planning authorities, regional/local development departments, chambers of commerce, rail infrastructure companies, rail operators, road transport authorities
Proposed duration:	36 months
Proposed time frame:	Month 1 – Month 36

8.4.18.1.2 Facilitate private involvement in port financing

Facilitation of private involvement in port financing refers mostly to the legal facilitation of various public-private partnership (PPP) agreements. This measure involves the following sub-measures, as defined by participating countries[59]:

- Port authorities should be corporatized so as to be allowed to work under company law, thus simplifying the B2B contracting procedures.
- Port authorities should be allowed more autonomy in decision making on PPP processes.
- PPP processes should be as simple as possible and flexible, and to include non-discriminatory features, public announcement, public procurement.
- PPP should be regulated by a clear, comprehensive, precise but not too excessive laws.
- For PPP projects, the time reserved for preparation of operational programmes should be sufficiently long.
- PPP projects should be accompanied by comprehensive information system on PPP funding opportunities.
- Individual PPPs should have a specific way of determining payments
- Land should be excepted from priority investment property.
- PPP "success stories" and its knowledge sharing should be boosted from the top level.
- PPP schemes, including legislation and/or contracts must specify or set clear instructions on how the fees are paid, who pays what and who charges what from users.
- Property rights (from Grantor to concessionaire, and vice-versa) should be flexible and transfer of (temporary) ownership should be made possible.
- Termination conditions, including early termination, of PPP contracts should be set well in advance.
- Concessions on demand should be clearly regulated and facilitated in the legislation.
- Concession agreements should be made more flexible, allowing the easier respond to market dynamics.
- PPP agreements should last long enough so as to enable return of investment and reasonable profit.
- Land ownership issues, spatial planning issues, port area delimitation and property issues should be solved before entering any PPP venture or before the preparation of Concession act, where applicable.
- Concession fees and all other chargeable types of fees should be clearly specified in the legislation and/or concession contracts, transparent, non-discriminatory and fair.

[59] Most of the sub-measures may involve legal interventions and changes of laws. Even though the study team is of the opinion that no legal obstacle is really an obstacle if the will to change exists, it needs to be noted that these measures depend on the possibility to perform the legal interventions in different countries.

- PPP schemes should be accompanied with guidelines on financial modelling and risk matrices.
- Training should be provided for PPP.
- A regional institution for tracking and assisting PPP should be created.
- Transparency on PPP agreements and procedures should be maximized and compulsory.
- Port governing bodies (port authorities and similar) should be entitled to determine the concession fees and port charges and to collect revenues from concession fees and other fees payable to the port authority. In addition, port authorities should be directly involved (if not leading it) in the concession process from the very beginning.
- Concession contracts must be fully in line with the existing regulation and control mechanisms should be made for that purpose.
- Concessionaires should be stimulated to renew and maintain all assets granted for operation.
- Concessions or any other PPP schemes should have control and monitoring mechanisms, such as performance metrics, so as to allow proper and timely reaction in case of problems.
- When new ports or terminals are constructed under BOT concessions, the Grantor can consider giving the operator the exclusivity right for up to 5 years.
- PPP agreements should always involve lenders, so as to increase the quality of the agreement.

Proposed responsible organisation(s):	Port authorities, port operators, financing institutions / lenders, ministries of transport, ministries of economy, ministries of finance, development agencies, spatial planning authorities
Proposed duration:	36 months (for studies and legal preparation, thereafter continuous)
Proposed time frame:	Month 13 – Month 48

8.4.19 Objective 19: Increase awareness of port importance and attract new skilled workforce

Ports are needed to create economic value and to facilitate trade, which is the main blood line of any economy. The question is, how many people outside the port industry are really aware of this fact? If ordinary people think about ports at all, do they see ports as engines of economic growth or simply as dirty industrial sites, often muddy, where old and rusty ships and barges load and unload dirty, dusty, noisy and polluting cargoes, ruining the landscape of the riverside or downtown image? In order to avoid the latter view, ports need to act and improve their image or keep it as positive as possible. In addition, the positive image of ports will be helpful in operating the ports and especially in cases when ports need to develop and expand. The public support of ports that are seen positively by the wider society of host cities and towns is likely to be stronger and thus more helpful in achieving ports' goals. Moreover, since the skilled workforce is always in deficit, apart from creating new generations of port

managers and port operators, Danube port need to pay utmost attention to the health, safety, satisfaction and well-being of the employees in port authorities and port operators.

8.4.19.1 Implementation measures

8.4.19.1.1 Ensure wider social acceptance and awareness of ports

Apart from the compulsory involvement of public (through public consultations on capital projects), the best way to ensure wide social acceptance and awareness of ports' importance is to involve the general public of the host cities and towns in the everyday life of ports. This can be done in multiple ways: from actively interacting with the wider audience through social networks, making short documentaries on ports' life and importance of ports (keeping the boring statistics and commercial issues out of main focus), to organising events in, and visits to ports. Social networks represent easily accessible platform where current or planned port activities can be discussed. They are a convenient tool to emphasize the openness, accessibility, importance and sustainability of ports. Using this tool, port authorities and port operators can strongly influence the public opinion on certain issues in and around ports, as well as create positive image and reputation. Furthermore, people should be brought back to ports in order to physically experience the port life and port operations and thus understand what a port is all about. Bringing people back to ports involves thematic visits, open port days, organisation of various events in ports, no matter how small ports may be.

Although it was written for much larger and historically much older seaports, European Seaport Organisation's (ESPO) Code of Practice on Societal Integration of Ports[60] can be a useful guideline for inland ports. In fact, the Danube Ports Network as a new association of Danube ports could adapt such code for the use in inland ports and make it a textbook for societal integration of Danube ports.

Proposed responsible organisation(s):	Port authorities, DPN, local authorities, municipal/regional authorities, port operators
Proposed duration:	18 months
Proposed time frame:	Month 21 – Month 39

8.4.19.1.2 Provide favourable working conditions in ports

Ports should have an impact on the supply side of the workforce market in order to attract more educated workers to ports. This means that ports should find a way to connect ports to educational institutes, as already elaborated in measures for Objective 8. While having an impact to education is one thing, attracting and keeping qualified workforce in ports is another and requires due attention. This has been partly tackled in the report titled "Guidelines on Human Capacity Building in Ports"[61], elaborated within the Daphne project, where various recommendations are given. In addition to this, ports should be more proactive in attracting skilled workforce through attractive remuneration schemes, additional benefits,

[60] https://www.espo.be/media/espopublications/ESPOCodeofPracticeonSocietalIntegrationofPorts2010.pdf
[61] Group of authors (2019), *Guidelines on Human Capacity Building in Ports*, Daphne project, WP4, Output 4.3, Part 2.

additional life and medical insurance, kindergartens for the children of employees, flexible working hours where possible, and other benefits that could clearly distinguish ports as work places more attractive than others.

Proposed responsible organisation(s):	Port authorities, port operators, municipalities
Proposed duration:	84 months
Proposed time frame:	Month 13 – Month 96

8.4.20 Objective 20: Improve and maintain the treatment of ports as public goods of strategic importance

Ports have been treated as public goods (a.k.a. goods of common interest), or public domain, for almost 2000 years, and for a good reason. First systematized regulations on ports as public goods date back to 6th century AD[62], where Justinian wrote that "all rivers and ports are public good" (lat.: *flumina autem omnia et portus publica sunt*). Many other Roman emperors dealt with ports as public goods[63]. Treatment of ports as public goods remains widely applied throughout the middle ages[64], as well as in the 19th century monarchs[65], all the way to the modern days. With the exception of just a few countries in the world (e.g. United Kingdom), ports are rightly treated as public or common good. Contemporary legal systems usually allocate strategic importance to ports (in addition to giving them the status of public goods) either explicitly or implicitly. This means that the construction and exploitation of ports receive maximum attention from the public authorities (state, regions, municipalities, etc.). In addition to this, the treatment of ports as public goods protects ports from badly performed privatisations. Serbian legal system, for example, recognizes ports as goods of common interest (similar to public good) and gives the works on construction and maintenance of ports the status of the "state importance".

8.4.20.1 Implementation measures

8.4.20.1.1 Promote ports as strategic objects of national transport infrastructure

Public goods in ports are those that are fundamentally non-divisible and non-consumable, such as port safety, security, and a healthy environment on the one hand, and port land, lighthouses, buoys, coastal and river bank protection works, including quay walls, approach channels and other hydro-technical objects necessary to create ports and port basins on the other hand. Significant share of the value of public goods cannot be recovered through services of private companies, and for this reason private companies have no or very little

[62] Birks, P, and McLeod, G. (Tr.) (1987), *Justinian's Institutions*, Cornell University Press, New York.
[63] Jovanović, S. (2019), *Public goods and public interest in ports*, Lectures given at the World Maritime University, Malmö.
[64] "Las Partidas" (Spanish medieval codes, XI – XIII century), treat coastal areas, ports and even road as common goods: "Rivers, ports, and public roads belong to all men together…" – Ley 6, título XXVIII, 3ª Partida. In: Jovanović (2019).
[65] Austrian Civil Code of 1811, Art. 287: "No one's things are those which all citizens can posses. Those things, however, which they are entitled only to use, such as, roads, big and small rivers, ports and sea shores, are called public good". In: Jovanović (2019).

incentive to produce them. The use of public goods, in addition, creates positive externalities. Moreover, the social benefits generated by public goods and their use are much higher than the charges a private operator might collect in return of producing such public goods. Therefore, taking into account all the positive externalities and socio-economic benefits created by ports, it is well justified that ports have been treated as public goods since ancient history to modern days.

In this view, regardless of their governance (public service port, tool port, landlord port) and operational mode (concessions, leases, management/operation outsourcing, operational licenses, corporatized ports, etc.) ports should receive rightful attention in the legislation of riparian countries and be treated as national transport infrastructure objects of highest strategic importance, especially in the landlocked countries.

Proposed responsible organisation(s):	Port authorities, ministries of transport, ministries of finance, ministries of economy, municipal authorities, DPN
Proposed duration:	96 months (and continues)
Proposed time frame:	Month 1 – Month 96

8.4.20.1.2 Protect public interest and public domain in ports

There is a strong public interest in ensuring that ports operate efficiently and safely, that fair and competitive services are provided, and that ports support and foster economic development locally and nationally. The public interest in ports stems from the vital role that ports play as gateways of economic trade and commerce for most nations. For example, over 90% of European external trade relies on ports. More than 43% of intra-European trade in determined areas relies on inland waterway ports. There are ca. 1500 seaports and ca. 1000 ports on some 40.000 km of inland waterways in Europe. Waterborne transport pollutes 13 times less than road transport in terms of carbon-dioxide and 19 times less in hydrocarbon emission. Ports provide means for loading/unloading of ships having the carrying capacity from 40 to 4000 times bigger than an average truck of 25 tons capacity meaning that each ship or convoy (on IWW) replaces 40 to 4000 trucks thus alleviating congestion and reducing pollution. Ports and port-related companies generate added value of over 20 billion EUR. More than 1 million people are employed in ports and port-related industry in Europe.

Port activities of public interest are activities of interest for wider community and activities beneficial for every single member of a community or for a part of community, while harming no one.

Taking into account the above facts, the following aspects of public interest in ports can be identified:

- Market access and fair competition
- Nautical-technical safety
- Port planning
- Effective port land management

- Quality and continuity of port authorities
- Positive modal shift and environment

Market access and fair competition. The public interest in this segment of port industry is focused on facilitation of market access to port services under the equal rules for everyone. This means that the public sector and the lawmakers should instate the legal framework for adequate inter-port and intra-port competition, level playing field for port operators and mechanisms for price dumping control and prevention.

When *nautical-technical safety* is concerned the public interest in this segment is centred around the safe and secure functioning of the vessel traffic in the port zones and its approaches. Therefore, adequate laws should be adopted to deal with traffic control, vessel traffic management systems, towing and pilotage (where applicable).

Port planning is another segment of port industry where the public interest needs to be protected. Here, the wider public is interested in proper planning of new ports, re-development of old ports, coordination of various interests and stakeholders, transparency of port financing issues, economic multiplier effects, job creation capability and economic development. For this reason, it is necessary that the adequate legal framework exists in order to protect these interests.

Effective port land management is also a public interest as it deals with the rational use of available space which is a finite and irreplaceable resource. In this view, the transparency of land lease and/or concession procedures should be well safeguarded in the applicable regulation.

Quality and continuity of port authorities is important for the public interest as port authorities (in whichever form they exist) are responsible for maintaining and enhancing the competitiveness of the whole port system, as well as to monitor the efficiency of concessions, operating authorizations, land leases and secure efficient use of public money.

Positive modal shift and environment is obviously a public interest in terms of both positive and negative environmental effects ports can cause. Therefore, with the maximal assistance of the regulatory bodies in the riparian states, ports should facilitate the use of waterborne transport as the most environmentally friendly mode of transport. In addition, ports should have a regulatory basis for the “greening” of ports and port operations.

Proposed responsible organisation(s):	Port authorities, ministries of transport, ministries of finance, ministries of economy, municipal authorities, spatial planning authorities
Proposed duration:	96 months (and continues)
Proposed time frame:	Month 1 – Month 96

9 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 also 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 (“Belt Road Initiative”), 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 substantial 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,

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 run.

All inland ports have (or aim to have) a triple function in the transportation chain and in the overall transportation network. First of all, ports are (or at least they should be) efficient transshipment nodes where cargo is transhipped from inland waterways (IWW) to land modes of transport (road and rail) and vice-versa, as well as stored between two different legs of transport, or stored as stock. Second function of inland ports is of wider scope and involves its nodal function both in the transport network and in the local/regional economy. Due to the fact that cargo and ships require and attract not only basic port services but also value added services, the ports can easily become a desirable location for settlement of port-related industries, logistic industries and even manufacturing industries who want to be directly on the most efficient inland waterway transport corridors and in or near ports as most important nodes of the entire transportation network. Last, but not least, the third function of an interface between long distance transport and the urban last mile, is, unfortunately, not sufficiently developed in the Danube region. Nevertheless, thanks to their location, ports can bring the urban freight within the port cities or near them, restricting the road transport to the “last mile”, and thus reducing the road transport congestion.

One of the most important roles of inland ports is their role in the multimodal transport chain due to their location close to logistic centres, industrial or agricultural areas and large consumer markets such as large cities. Taking into account the fact that ports are nodal points for at least two, and in the most cases three transport modes (IWW, road and rail), ports are attractive not only for their core transport modes (IWT or maritime transport), but also for rail and road transport companies because ports are important generators of their cargo flows and businesses.

Increasing the efficiency of management and operations of ports (governance, transshipment, storage, handling and value added services) as well as modernization of ports’ infrastructure, suprastructure and hinterland connections would enable a win-win situations for all port stakeholders, while doing absolutely no harm to anyone whatsoever. This is why the position of ports is unique and represents an opportunity that should be taken immediately, for the benefit of all actors in the transport and supply chains including maritime and inland waterway transport. Nevertheless, all these enhancements require funds, which tend to be scarce if only public sources are considered. In this view, an increased level of public-private partnerships (PPP) is needed in order to optimize investments not only on demand basis, but also on business generating capabilities of ports and their operators. Apart from funding, port development requires multidisciplinary approach: engineering, management, education and training (human resources and skilled workforce) and efficient planning and land use. This is

why strategic development objectives include all this aspects and measures needed to reach such objectives.

In order to be sustainable, port development needs to reduce its environmental footprint. In this view, "greening" of port operations not only a must, but also within reach, thanks to the new technologies (alternative fuels, energy use from renewable sources, shore-side electricity supply, etc.). Objectives involving "greening" of ports are also included in the list of strategic development objectives.

Danube ports have for long been "in the rear" in the battle for modernisation, in terms of infrastructure, technology, governance, management, organisation, intermodality, social acceptance, integration into transport and supply chains and, last but not least, funding from both national and supranational funds. Suppressed by various geopolitical events in the last century, many ports, especially those on the middle and lower Danube, have been largely neglected and suffered in many ways: lack of investments, maintenance, subject to political economics rather than economic policy, no or negligible share in the overall transport strategies of their host countries, inability of governments to understand the importance of ports as public goods, inability to clearly protect the public interest in ports, failure to separate the governance and operational roles (e.g. port authorities and port operators) in ports, hasty privatisation of ports in some countries forgetting the almost two millennia old rule that "*flumina autem omnia et portus publica sunt*" (all rivers and ports are public good[66]), lack of practical growth policies and actions, and many others.

Fortunately, the time for changes has come and the Danube region ports have the opportunity to live their "finest hour" in the forthcoming period. The world has gone forward, the trade patterns have changed, new trade routes are emerging, logistic industry is becoming more and more important as an irreplaceable part of the process starting with production and ending with consumption in the widest possible sense. On the way from its origin to its destination, logistic industry adds value to any cargo and that same logistic industry, being an integral part of the supply chain, needs ports as their nodal points where cargo is being loaded, unloaded, reloaded and, more importantly, processed. This cargo "processing" is what adds further value to the goods transiting ports and this "processing" is what determines the success of a port. This cargo "processing" is a value adding process, and the scope and quality of value added services offered in a port situates that port "upper" or "lower" on the "ladder" of logistic chains. Furthermore, the services offered not just within the port boundaries, but beyond them as well, determine the level of integration of ports into overall supply chains. Taking all this into account, opportunities for growth and success of ports are numerous, but they require action, will, knowledge and funds. The knowledge itself is available in the region, in and outside of the ports, actions require will and the will is up to port authorities and relevant governmental organisations. Clearly, funds are the necessary precondition, but not the self-sufficient one. On the one hand, some ports need first to catch up in terms of rehabilitation and modernization of their basic infrastructure, some of them need to solve the issues of land ownership, jurisdiction of port authorities, concession management, corporatization,

[66] Birks, P, and McLeod, G. (Tr.) (1987), *Justinian's Institutions*, Cornell University Press, New York.

technological enhancement. On the other hand, all of them need to stand together and work on the common challenges for the common good and interest.

This document provides the fundamental starting point for the development strategies of the Danube ports, aimed to facilitate the above discussed preconditions for success and to face the challenges. An inventory of objectives and needs of the national port industries and the port industry of the entire Danube region are presented, analysed and accompanied by the measures needed to be implemented in order to achieve these objectives and needs. Ports can "grab out of the bucket" and use them according to their own needs. The "arsenal" of 87 objectives and 172 measures (Table 29) represents an admirable source of ideas and the "holy grail" of knowledge sharing, benefits from co-opetition and a standing together for a common cause.

Table 29: Summary results of objectives and measures

Country	#Objectives	#Measures
Austria	8	16
Slovakia	8	11
Hungary	15	25
Croatia	6	19
Serbia	7	21
Romania	14	22
Bulgaria	9	17
Total national	67	132
Common	20	41
Overall total	87	172

(Source: iC)

Ports have the potential not to simply serve the economy, but to lead and boost the economy, to act as engines of growth in their host cities and regions. In order to reach this stage, Danube ports need to understand their role and impose it to the logistic industry in the region, through high quality infrastructure, efficient and flexible operations, customer orientation, value added services, stakeholder involvement, flexible planning and less rigid regulatory barriers and obstacles for creation of real logistic and industrial zones, or clusters, in or near port areas.

References

1. Alderton, P. (2008), *Port Management and Operations*, 3rd Edition, Informa, London.
2. Alexandru, B. (2017), "The Black Sea region has become the world's first grain exporter, with 20% of global production", *Capital*, 26 September 2017
3. Bernardi, B. (2019), "Making implementation happen", presentation given at the Danube Ports Network conference *Danube Ports in the digital age: challenges & opportunities*, Vienna
4. Bichou, K and Gray, R. (2004) "A Logistics and Supply Chain Management Approach to Port Performance Measurement", *Maritime Policy and Management*, Vol.31, No.1, pp.47-67
5. Birks, P, and McLeod, G. (Tr.) (1987), *Justinian's Institutions*, Cornell University Press, New York.
6. Ciobotaru, T. (2018), *The law that hinders Danube navigation*, România liberă, 18 January 2018
7. EC (2005), Directive 2005/44/EC of the European Parliament and of the Council of 7 September 2005 on harmonised river information services (RIS) on inland waterways in the Community
8. EC (2007), Communication on a European Ports Policy {SEC(2007)1339} {SEC(2007)1340} /* COM/2007/0616 final */
9. EC (2010), Directive 2010/65/EU of the European Parliament and of the Council of 20 October 2010 on reporting formalities for ships arriving in and/or departing from ports of the Member States and repealing Directive 2002/6/EC
10. EC (2010a), 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
11. EC (2011), Directive of the European Parliament and of the Council on the award of concession contracts, COM(2011)897
12. EC (2013) Communication from the Commission, "Ports: an engine for growth" /* COM/2013/0295 final */
13. EC (2013a), Regulation (EU) No 1315/2013 of the European Parliament and of the Council of 11 December 2013 on Union guidelines for the development of the trans-European transport network and repealing Decision No 661/2010/EU
14. EC (2013b), Regulation (EU) No 1316/2013 of the European Parliament and of the Council of 11 December 2013 establishing the Connecting Europe Facility, amending Regulation (EU) No 913/2010 and repealing Regulations (EC) No 680/2007 and (EC) No 67/2010
15. EC (2013c), Communication from the Commission to the European Parliament, the Council, The European Economic and Social Committee of the Regions "Towards quality inland waterway transport NAIADES II" /* COM/2013/0623 final */
16. EC (2013d), Regulation (EU) No 1315/2013 of the European Parliament and of the Council of 11 December 2013 on Union guidelines for the development of the trans-European transport network and repealing Decision No 661/2010/EU

17. EC (2013e), Regulation (EU) No 1315/2013 of the European Parliament and of the Council of 11 December 2013 on Union guidelines for the development of the trans-European transport network and repealing Decision No 661/2010/EU
18. EC (2014), Directive 2014/94/EU of the European Parliament and of the Council of 22 October 2014 on the deployment of alternative fuels infrastructure
19. EC (2014a), Directive 2014/94/EU of the European Parliament and of the Council of 22 October 2014 on the deployment of alternative fuels infrastructure
20. EC (2016), Commission Notice on the notion of State aid as referred to in Article 107(1) of the Treaty on the Functioning of the European Union (2016/C 262/01)
21. EC (2017), Commission Regulation (EU) 2017/1084 of 14 June 2017 amending Regulation (EU) No 651/2014 as regards aid for port and airport infrastructure, notification thresholds for aid for culture and heritage conservation and for aid for sport and multifunctional recreational infrastructures, and regional operating aid schemes for outermost regions and amending Regulation (EU) No 702/2014 as regards the calculation of eligible costs
22. Flynn, M., Lee, P., Notteboom, T., (2011) "The next step on the port generations ladder: customer-centric and community ports", in: Notteboom, T., *Current Issues in Shipping, Ports and Logistics*, University Press Antwerp, Brussels 2011, p. 503
23. Garcés de los Fayos, F. (2013), *The EU's Black Sea policy: Where do we stand?* – Directorate General for External Policies, Policy Department, September 2013.
24. Group of authors (2012), *Report on Strategic Planning*, Word Bank, New York
25. Group of authors (2012), *Strategy for the development of the transport system of the republic of Bulgaria until 2020*, Sophia
26. Group of authors (2013), *Feasibility Study for Fuel Terminal in Constanta*, prepared by Stopford for Vadeco SRL, 2/05/2013
27. Group of authors (2014), *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)
28. Group of authors (2015), *Grain Terminal at berth no. 80 in Constantza South Port* - documentation for obtaining the environmental agreement, IPTANA SA, January 2015, *http://apmct.anpm.ro*
29. Group of authors (2016), *General Transport Master Plan for Romania* – GD no. 666/2016
30. Group of authors (2016), *Master Plan Port of Constanta,* Final report, Ernst & Young SRL - INROS LACKNER SE
31. Group of authors (2018), *Danube ports SWOT analysis*, Daphne project, WP6, Deliverable D.6.1.1
32. Group of authors (2018), *Financing model and Business plan of the Danube Ports Network*, Daphne project, WP6, Deliverable 6.2.3
33. Group of authors (2018), *Good practices report on port management models*, Daphne project, WP4, Deliverable D. 4.2.4
34. Group of authors (2018), *Guidelines for Industrial Development in Ports*, Daphne project, WP5, Deliverable D.5.1.3
35. Group of authors (2018), *List of objectives and necessary development measures*, Daphne project, WP6, Deliverable D.6.1.2

36. Group of authors (2019), *Green Port Policy Guidelines*, Daphne project, WP 4, Output 4.3, Part 1
37. Group of authors (2019), *Guidelines on Human Capacity Building in Ports*, Daphne project, WP4, Output 4.3, Part 2.
38. Jovanović, S. (2019), *Public goods and public interest in ports*, Lectures given at the World Maritime University, Malmö.
39. Lee, P., Lam, J. (2016), "Developing the Fifth Generation Ports Model", in: *Dynamic Shipping and Port Development in the Globalized Economy*, ed. P. Lee, K. Cullinane, Palgrave Macmillan, London, p. 188
40. Morash, E.A. and Clinton, S.R. (1997) "The role of transportation capabilities in international supply chain management", *Transportation Journal*, Vol.36, No.3, pp.5-17
41. National strategy for development of concessions in the Republic of Bulgaria 2018-2027
42. *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
43. Robinson, R (2002) "Ports as elements in value-driven chain systems: The new paradigm", *Maritime Policy and Management*, Vol.29, No.3, pp.241-255
44. *South-West Oltenia Region Development Plan 2014-2020*, *www.adroltenia.ro* (in Romanian language)
45. Taneja, P. (2013), *The Flexible Port*, PhD Thesis, Delft University, The Netherlands
46. *The Mayor of Giurgiu activity report*, 2016, *www.primariagiurgiu.ro* (in Romanian)
47. UNCTAD (1994) The trading port - the prospects of the ports of the third generation, New York.
48. Vernon, J. (Tr.) (1912), "The Four Oxen and a Lion", in: *Aesop's Fables*, William Heinemann, London

Internet sources:

1. http://tfig.unece.org/contents/unece-uncefact-recommendations.htm
2. http://tfig.unece.org/pdf_files/A9R149C.pdf
3. http://www.epcsa.eu/
4. http://www.imo.org/en/About/Conventions/StatusOfConventions/Documents/StatusOfTreaties.pdf
5. http://www.imo.org/en/OurWork/Facilitation/ConventionsCodesGuidelines/Pages/Default.aspx
6. http://www.imo.org/en/Pages/Default.aspx
7. http://www.intermodal-cosmos.eu/content/intermodal-transport-in-south-east-europe/intermodal-basics/intermodal-terminals/index_eng.html
8. http://www.interreg-danube.eu/approved-projects/dante
9. http://www.interreg-danube.eu/approved-projects/energy-barge
10. http://www.interreg-danube.eu/uploads/media/approved_project_public/0001/30/0bd26f9facbaeb21cedc9721892a3c7d2388d16c.pdf
11. http://www.lngmasterplan.eu
12. http://www.optransport.bg/upload/docs/OPTTI_ENG_17112014_verision_1.pdf

13. https://ec.europa.eu/inea/en/connecting-europe-facility/cef-transport/projects-by-country/romania/2014-ro-tmc-0313-w
14. https://ec.europa.eu/transport/modes/maritime/digital-services/e-maritime_en
15. https://ec.europa.eu/transport/modes/maritime/ports/ports_en
16. https://ec.europa.eu/transport/sites/transport/files/2018-military_mobility_action_plan.pdf
17. https://ec.europa.eu/transport/sites/transport/files/modes/maritime/studies/doc/2013-07-ia-port-services.pdf
18. https://ec.europa.eu/transport/themes/infrastructure/ten-t-guidelines/corridors/corridor-studies
19. https://ec.europa.eu/transport/themes/infrastructure/ten-t-guidelines/project-funding_en
20. https://ipcsa.international/pcs
21. https://ipcsa.international/pcs
22. https://unctad.org/en/PublicationsLibrary/tdc4ac7_d14_en.pdf
23. https://www.danube-region.eu/about/our-targets
24. https://www.designingbuildings.co.uk/wiki/Integrated_transport_system
25. https://www.ecoports.com
26. https://www.espo.be/media/espopublications/ESPOCodeofPracticeonSocietalIntegrationofPorts2010.pdf
27. https://www.merics.org/en/papers-on-china/chinese-fdi-in-europe-2018
28. https://www.publics.bg/bg/news/17594/
29. https://www.satamatieto.fi/portensys
30. www.apdf.ro
31. www.constantza-port.ro
32. www.danube-euroaccess.eu
33. www.economica.net
34. www.interreg-danube.eu/about-dtp/eu-strategy-for-the-danube-region
35. www.nkr.government.bg
36. www.zlg.ro

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	• 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
						• 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 principle of partnership at the Port Community level	
Weaknesses	• Low capacity utilization • Capital intensity • Business models	• Long transport times in water transport low transport capacities of an existing fleet	• Road and rail links are cumbersome in most cases • The amount of loadable goods	• All of the Inland Ports (Including Vukovar and Slavonski Brod) are defined as of State	• Port infrastructure • Old equipment • Lack of equipment for waterside handling of	• The lack of a port community-integrated IT system which would allow for the fast and	• Unsatisfactory condition of the port infrastructure and the connecting infrastructure;

	AT	SK	HU	HR	RS	RO	BG
	• 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	• Weak awareness of the possibilities of use of water transport by logistics operators in Slovakia need for multiple transhipment	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	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	containers and heavy weight cargo. • Lack of storage space for agricultural products (silo) • Focused mostly on agricultural products or certain industry in the hinterland	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	• 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;

	AT	SK	HU	HR	RS	RO	BG
				needs a redefinition of activities		• Insufficient connections to hinterland • 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	• 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	• 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

	AT	SK	HU	HR	RS	RO	BG
	• New industrial clusters		• Taking advantage of free loading capacity • Improving shipping conditions (Danube waterway)				granted on concession; • 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	• 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	• 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
	• International (global) economy • Overcapacity • Rail bottlenecks					• 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	waste treatment facilities. • Insufficient investment in port infrastructure and new handling technologies • Lack of resources for maintenance and repair.

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Annex II: Proposed timeline for the common strategic objectives and development measures