

MASTER PLAN

**FOR DEVELOPMENT OF PORTS OPEN TO
PUBLIC TRAFFIC OF COUNTY AND LOCAL
IMPORTANCE IN THE AREA OF THE**

PORT AUTHORITY OF SENJ

SUMMARY

Made within the FRAMESPORT project and the Interreg Italy-Croatia
Cross-border Cooperation Program 2014-2020



Rijeka, December 2021.

Name: MASTER PLAN FOR DEVELOPMENT OF PORTS OPEN TO
PUBLIC TRAFFIC OF COUNTY AND LOCAL IMPORTANCE IN
THE AREA OF THE PORT AUTHORITY OF SENJ

Client: PORT AUTHORITY SENJ
Obala Kralja Zvonimira 12
53270 Senj
Croatia

Contractor: MEDICOM L.t.d.
Meštrovićeva 16
51000 Rijeka
Croatia

dr. sc. Renato Oblak
dr. sc. Donald Schiozzi

Project Manager: Marin Mijolović, dipl. oec.

INTRODUCTION

The master plan for the development of ports open to public traffic of county and local importance in the area of the Port Authority of Senj was developed within the framework of the EU project FRAMESPORT (“FRAMEwork initiative fostering the sustainable development of Adriatic Small Ports”), which is implemented within the framework of the Cross-border Cooperation Programme Interreg Croatia - Italy. The general objective of the project is to improve the quality, safety and environmental sustainability of maritime and coastal traffic services and nodes by promoting multimodality throughout the Italian-Croatian Adriatic coastal area. The implementation of the FRAMESPORT project aims to support the homogeneous and integrated improvement of the sustainability, competitiveness and attractiveness of Adriatic ports through:

- creating a strategic framework that directs their future development in the long term,
- realisation of the ICT platform as a virtual space available to users and stakeholders, containing the results of the implementation of pilot actions, examples of good practices and proposals and ideas for the development and management of Adriatic ports and
- increasing competences for coordinated planning and management of ports, thus contributing to fostering their role as drivers of sustainable growth of coastal areas.

The master plan is a basic strategic document on the basis of which the sustainable development of ports in the area of Lika-Senj County can be planned. By analyzing the legislation, the current state of ports and their environment, and by elaborating the development opportunities and guidelines of each individual port, the basic prerequisites for the implementation of future port projects will be created, which will certainly contribute to the improvement of port infrastructure and supra-infrastructure, and which will undeniably positively affect the local economy and social life as a whole.

By clearly defining the level and needs of investments in ports under the management of the Port Authority of Senj, the master plan will create basic preconditions in a systematic approach to planning their efficient and sustainable development. Its full implementation will also ensure the necessary level of environmental and nature protection not only in port areas, but also in immediate port environments. Optimizing and rationalizing investments within the planned development port projects will contribute to a more even development of all ports in the area under the jurisdiction of the Port Authority of Senj in view of the identified potential of their possible development. Based on the collected and analyzed data, the facts on the status and possibilities of development of each individual port will be determined, which will create a quality platform for determining the required level of investments, but also for initiating activities in the preparation of the necessary documentation necessary for accession to future co-financing programs by the line Ministry and the European Union.

The structure of the master plan for the development of ports open to public traffic of county and local importance in the area of the Port Authority of Senj consists of nine interconnected units. The introductory part of the study explains the basic reasons that led to the need to develop a master plan for port development in the area of Lika-Senj County, as well as its basic structure. The second part provides basic information about the client of the study, i.e. basic information about the Port Authority

of Senj. The third part analyses the applicable legislation and strategic documents that directly or indirectly regulate the entities, as well as their mode of operation and management, as well as basic rights and obligations in the port area. In the fourth part, based on the conducted office and field research, an analysis and assessment of the current state of the ports was carried out. The geographical location of ports and port area, their area, content and activities available and performed in ports, technical and technological characteristics of port infrastructure and suprastructures, berth capacities, port equipment, existing and potential future port traffic, navigation and meteorological-oceanological conditions in ports, as well as the existence of adjacent port capacities and their direct or indirect impact on each port were analyzed. Based on the collected data, a summary qualitative and quantitative expert assessment of the condition of all ports is presented. The fifth part sets out the basic criteria for assessing onions. In the sixth part, a multi-criteria analysis of arc valuation was performed in accordance with the set criteria. The multicriteria analysis covered the transport-technological and socio-economic aspect of the existing state of ports. In the seventh part, the development criteria for evaluating port development plans are presented and the spatial-planning plans of ports are presented, which were developed in accordance with the conclusions reached on the basis of the conducted research. A multi-criteria analysis was conducted that included different categories of evaluation of individual development sub-criteria. In the eighth part, four possible basic development scenarios of ports were set up. The evaluation of each individual scenario using the multi-criteria decision-making method was analyzed and performed. In the last part of the study, the final conclusion of the conducted research was presented and the basic guidelines of efficient and sustainable development of ports under the management of the Port Authority of Senj are listed.

The Port Authority of Senj was established on the basis of the then applicable Article 31, paragraph 3 and Article 32 Of the Law on Seaports ("Official Gazette" no. 108/95), Article 12, paragraph 3 and Article 13 Of the Law on Institutions ("Official Gazette" no. 76/93) and Article 29 Of the Statute of the Lika-Senj County ("Županijski glasnik" no. 5/97 - consolidated text), and the decision on its establishment was adopted by the County Council of the Lika-Senj County at its session held on 29 January 1998 ("County Gazette" no. 1/98).

The Port Authority of Senj is registered as an institution in the Register of Commercial Courts in Rijeka under the registration number of the entity (MBS) 020027576, personal identification number (OIB) 43342467134 and is registered in the register of non-profit organizations on 6 August 2009 under RNO number 0002305. The seat of the Port Authority of Senj is located at Obala Kralja Zvonimira 12, 53270 Senj, Croatia.

In accordance with the program determinants based on the Law on Maritime domain and seaports ("Official Gazette" no. 158/03, 100/04, 141/06, 38/09, 123/11, 56/16 and 98/19), during the period in the area of Lika-Senj County, the Order on the classification of ports open to public traffic in the area of Lika-Senj County ("Official Gazette" no. 100/18) are classified as 20 ports open to public traffic of county and local importance. Out of the total number of ports listed, the Port Authority of Senj manages 5 ports open to public transport of county importance and 9 ports open to public transport of local importance.

The port area of ports managed by the Port Authority of Senj includes all port basins, anchorages and moorings within the boundaries of the port area. Under its jurisdiction there are ports open to public traffic of county importance: the port of Jablanac, the port of Karlobag, the port of Prizna, the port of Senj and the port of Stinica and ports open to public traffic of local importance: the port of Barić Draga, the port of Cesarica, the port of Donja Klada, the port of Karlobag - cargo port, the port of Krivača, the port of Lukovo, the port of Porat, the port of Starigrad and the port of Sveti Juraj.

Through the port of Prizna and the port of Stinica, the following national ferry lines take place:

- state ferry line no. 335 (Prizna - Žigljen) - maintained by the shipowner Jadrolinija and
- state ferry line no. 337 (Mišnjak - Stinica) - maintained by the shipowner Rabska plovidba.

The total surface area of the port area managed by the Port Authority of Senj is 611,730 m², of which the surface area of the marine aquatorium occupies 479,830 m², and the land part 131,900 m². The Port Authority in the area of the ports manages a total of 1,080 berths for ships and boats, of which 1,066 are communal berths and 14 nautical berths.

LEGAL FRAMEWORK AND STRATEGIC DOCUMENTS

Within the framework of the legal regulation governing port administrations and ports open to public traffic of county and local importance, all legal sources that directly or indirectly regulate entities and the manner of management and basic rights and obligations in the port area were analyzed, and included the following documents:

- 1) Maritime Code ("Official Gazette" no. 181/04, 76/07, 146/08, 61/11, 56/13, 26/15 and 17/19),
- 2) Law on Maritime domain and seaports ("Official Gazette" no. 158/03, 100/04, 141/06, 38/09, 123/11, 56/16 and 98/19),
- 3) Law on Transport in Liner and Occasional Coastal Maritime Transport ("Official Gazette" no. 33/06, 38/09, 87/09, 18/11, 80/13, 56/16 and 121/19),
- 4) Law on State Border Surveillance ("Official Gazette" no. 83/13 and 27/16),
- 5) Decree on the classification of ports open to public traffic and special purpose ports ("Official Gazette" no. 110/04 and 82/7),
- 6) Regulation on the conditions to be met by ports ("Official Gazette" no. 110/04),
- 7) The order on the classification of ports open to public traffic in the area of Lika-Senj County was issued on 29 October 2018 ("Official Gazette" no. 100/18),
- 8) Regulation on Environmental Impact Assessment ("Official Gazette" no. 61/14 and 3/17),
- 9) Regulation on standards and conditions to be met by border crossing points for the efficient and safe performance of border control ("Official Gazette" no. 57/14 and 16/18),
- 10) Rulebook on the criteria for determining the purpose of a particular part of a port open to public traffic of county and local importance, the method of payment of berths, conditions of use and determining the maximum amount of compensation and distribution of revenues ("Official Gazette" no. 94/07, 79/08, 114/12 and 47/13),
- 11) Ordinance on the conditions and manner of maintaining order in ports and other parts of the internal waters and territorial sea of the Republic of Croatia ("Official Gazette" no. 72/21),

- 12) Ordinance on the conditions and manner of placing fish and other marine organisms on the market ("Official Gazette" no. 154/08),
- 13) Decision on the list of landing places for fishing vessels engaged in commercial fishing at sea ("Official Gazette" no. 10/20, 145/20 and 112/21),
- 14) Decision on the establishment of the Port Authority of Senj and related amendments ("County Gazette of the Lika-Senj County" no. 1/98, 2/00, 19/04, 7/05 - consolidated text, 26/07, 21/09, 7/12, 14/13, 18/13, 8/14, 14/14 - consolidated text, 29/17 and 15/21) and
- 15) Decision on granting consent to the Decision on the establishment of the Port Authority of Senj.

Also, for the purposes of preparing the master plan of port development, valid spatial planning documentation was analyzed that directly affects the spatial planning and management of the coastal area of Lika-Senj County, where ports open to public traffic of county and local importance are located under the management of the Port Authority of Senj. Since spatial plans are mandatory documents that determine and direct interventions in the county for a certain period of time and can directly limit the efficient exploitation of seaports, the analysis of spatial planning documentation included the following documents:

- 1) Of the Physical Planning Act ("Official Gazette" no. 153/13, 65/17, 114/18, 39/19 and 98/19) and
- 2) Spatial plan of Lika-Senj County ("County Gazette of Lika-Senj County" no. 16/02, 17/02 - correction, 19/02 - correction, 24/02, 3/05, 3/06, 15/06 - consolidated text, 19/07, 13/10, 22/10 - consolidated text, 19/11, 4/15, 7/15 - consolidated text, 6/16, 15/16 - consolidated text, 5/17, 9/17 - consolidated text, 29/17 - correction and 20/20).

In accordance with Art. 16. Of the Spatial Plan of the Lika-Senj County defines buildings that are of great importance for the County, so it is stated that traffic structures with associated buildings and devices include maritime buildings, as follows:

- existing
 - ports open to public traffic of county importance: Senj, Prizna, Žigljen, Jablanac, Karlobag, Novalja and Drljanda,
 - ports open to public traffic of local importance: Sveti Juraj, Donja Klada, Starigrad, Lukovo, Stinica - Mala Stinica, Krivača, Karlobag - cargo port, Cesarica, Porat - Lukovo Šugarje, Barić Draga, Stara Novalja, Tovarnele and Metajna and
- planned
 - ports open to public transport of county importance: Stinica (Mala Stinica),
 - ports open to public transport of local importance: Zubovići,
 - nautical tourism ports: Senj, Karlobag, Stara Novalja, Tovarnele, Lukovo, Starigrad, Sveti Juraj, Stinica - Krivača bay, Lukovo Šugarje - Porat bay,
 - ports of nautical tourism of the anchorage and mooring type shall be determined by the plan of the narrower area,
 - sports ports: Senj, Sveti Juraj, Cesarica, Karlobag, Lukovo Šugarje - bay Porat, Barić Draga, Novalja, Stara Novalja, Tovarnele, Potočnica, Metajna, Kustići and Zubovići,
 - fishing ports: Senj, Sveti Juraj, Jablanac and Karlobag and

- industrial ports: Senj and Stinica.

In addition, the development of ports open to public transport of county and local importance is directly influenced by various strategic documents that can significantly affect the possible directions of their development, and therefore the following documentation has been analyzed:

- 1) Strategy for Maritime Development and Integral Maritime Policy of the Republic of Croatia for the period from 2014 to 2020 ("Official Gazette" no. 93/14),
- 2) Strategic Plan of the Ministry of Sea, Transport and Infrastructure for 2020 - 2022,
- 3) Transport Development Strategy of the Republic of Croatia for the period from 2014 to 2030,
- 4) Transport Development Strategy of the Republic of Croatia for the period from 2017 to 2030,
- 5) Strategy for the Development of Nautical Tourism of the Republic of Croatia for the period 2009 - 2019,
- 6) National Strategic Fisheries Development Plan of the Republic of Croatia,
- 7) National Island Development Plan 2021 - 2027,
- 8) County Development Strategy of Lika-Senj County 2011 - 2013,
- 9) Marine Environment and Coastal Management Strategy of the Republic of Croatia,
- 10) Marine Strategy Framework Directive 2008/56/EC and
- 11) EU funds in the financial period 2021 - 2027.

Based on the analysis of all important legal, spatial-planning and strategic documents, data were extracted that best describe and link the key conditions and goals stated in these documents, all with the aim of setting the best possible criteria for assessing the existing and planned situation in ports open to public transport of county and local importance, which are under the management of the Port Authority of Senj.

ANALYSIS AND ASSESSMENT OF THE CONDITION OF THE PORTS

The analysis and assessment of the state of the ports was carried out in order to assess the relevant development needs in the ports, but expert assessments were additionally given in terms of meeting the existing needs for port capacities in the relevant area, i.e. in terms of meeting qualitative standards in the port.

It should be emphasized that ports open to public traffic of county and local importance are processed in such a way that the assessment of development potentials is made on the basis of the current state of port infrastructure.

The current state of port infrastructure, as well as the analysis and assessment of this state, is presented in such a way that the following parameters are described and evaluated for each port area:

- geographical location of ports and port areas,
- the area of port areas and the ratio to the total area of other port areas,
- facilities and activities available and carried out in ports,
- technical and technological characteristics of operational shores and mooring points,

- mooring capacities for different types of vessels,
- equipment enabling the safe stay of vessels in ports,
- existing turnover and potential future demand,
- navigation and meteorological-oceanological conditions of the position of the ports and associated anchorages and
- the existence of adjacent port facilities and their impact on ports, if it exists.

Based on the description and analysis of the existing state of port infrastructure, its purpose and the current method of use, a summary qualitative and quantitative expert assessment of the state of each of the 14 port areas of ports open to public traffic of county and local importance is presented. The presented estimates indicate development needs, which are later explained in detail in the chapter that describes the directions of port development. In addition, the analysis carried out looked at areas in the immediate vicinity that have or may have an impact on port activity, regardless of whether they fall within the existing boundaries of the port area or not. This is due to the fact that consideration of the future development of ports must also take into account the immediate environment enabling such development.

The results of the conducted analysis indicate that the current situation in ports under the management of the Port Authority of Senj is not uniform, but that ports can be divided into several different categories. The first category includes ports that are the most ordered and have the best built port infrastructure and supra-infrastructure, and that provide a higher level of content to their users. The second category includes ports that have a medium level of regulation, i.e. whose port infrastructure and supra-infrastructure are satisfactorily constructed, while these ports provide a limited level of port services. The third category includes unregulated ports with insufficiently constructed or non-existent port infrastructure and supra-infrastructure, which only provide their users with basic facilities that each port must meet in order to be subject to the Minister's order. The first port category includes the ports of Senj, the second category includes the ports of Cesarica, Donja Klada, Jablanac, Karlobag, Karlobag - cargo port, Lukovo, Prizna, Starigrad, Stinica and Sveti Juraj, and the third category includes the ports of Barić Draga, Krivača and Porat.

PORT EVALUATION CRITERIA

In the elaboration of the criteria for evaluating ports open to public traffic of county and local importance, it is necessary to distinguish between the criteria for categorising ports and the criteria for evaluating its development opportunities. This stems from the very methodology applied for the purpose of a realistic and systematic analysis of the functionality of the port system of the county ports.

It is undoubtedly essential for the categorisation of the existing ports that the current traffic and technological conditions are key to achieving transport connectivity, mainly of islands and island places with the mainland. Another multifunctional feature of ports open to public traffic of county and local importance is their influence on the concentration of economic and social activities in urban centers of the county and the need for ambient protection of certain localities within which ports are located, in

addition to meeting traffic and technological conditions, it is necessary to include socio-economic criteria in the criteria for categorization.

However, in order to determine the development potential of these ports, it is necessary to rearrange these criteria and to qualitatively and quantitatively assess the potential of individual ports within the county maritime transport system. Therefore, in accordance with the methodology used, the position is taken to choose separate sets of criteria, which according to their basic characteristic are called classification criteria and development criteria. In the elaboration of these two sets of criteria, sub-criteria were used that were extracted from previously analyzed legal, strategic and other documents, which regulate the maritime and transport system, ports and port activity, coastal regular transport, nautical tourism, fisheries, but also other characteristics that are directly related to ports open to public traffic of county and local importance.

The criteria can be grouped into two basic groups that describe the general objectives and orientation of the development of ports open to public traffic of county and local importance, namely:

1. traffic-technical functionality and
2. social acceptability and sustainability.

The first group of criteria describes the existing capacities, the state of port facilities and the existing level of port services, i.e. the potential for increasing the quality of transport connections, the reception of vessels and passengers, and the general functionality of the port and the quality of the port service. The second group of criteria describes the safety and environmental aspects in the port and the specificities of spatial designation with regard to development opportunities and the required level of protection. In this group of development criteria, financial sustainability is included in order to assess the complexity and efficiency of possible investment projects.

The set of classification and development criteria are presented separately in the following tables and detailed in the master plan **Error! Reference source not found.** **Error! Reference source not found.** **Error! Reference source not found.**

Table 1 - Classification criteria

Classification criteria		
Group	Basic criteria	Sub-criteria
TRAFFIC-TECHNICAL FUNCTIONALITY	Traffic connections	Existence of a shipping line
		Existence of a seaplane line
		Existence of occasional passenger transport
		Connection to road infrastructure
		border crossing point
	Traffic capacity	Length of operational shore (m)
		Number of communal berths
		Number of fishing berths
	Availability of basic port infrastructure	Number of nautical berths
		Port aquatorium area (m ²)
Availability of utility infrastructure (water, electricity, hydrants, lighting, ...)		
	Existence of ro-ro connections	

Classification criteria		
Group	Basic criteria	Sub-criteria
		Accessibility for cruise ships and their tenders
		Acceptance of seaplanes
		Availability of stretching/crane for vessels
		Availability of the vessel's fuel supply
	Quality of basic port infrastructure	Technical condition of mooring devices
		Functional state of the infrastructure
		Available space for movement of persons and vehicles along the coast
		Approach quality for vehicles
	Additional port facilities capacity	Area of the land part of the port area (m ²)
		Availability of parking in the port area
		Availability of space for vessel maintenance
		Availability of service facilities in the port area
SAFETY AND SECURITY OF THE PORT AREA	Safety and security of the port area	Degree of protection of the port
		Navigation safety in the port
		Vessel safety at berths
		Depth of the sea in the port
ECOLOGICAL EQUIPMENT OF THE PORT	Ecological equipment of the port	Port facilities and equipment for receiving waste from vessels
		Port equipment and means for environmental incidents
		Pollution risk level
LOCATION OF THE PORT	Location of the port	Proximity to urban and economic centers of the county
		Attractiveness of geographic accommodation
		Proximity to shipyards and vessel services
		Port area within the protected urban unit or under conservation protection
		Conflicts in space due to use for other purposes

Table 2- Development criteria

Development criteria			
Group	Basic criteria	Sub-criteria	
TRAFFIC-TECHNICAL FUNCTIONALITY	Increase/improve the capacity of the operational part of the port	Possibility/need to increase the capacity of the operational part of the port	
		Capacity increase/improvement models	
		Conversion of existing shores	
		Setting up the floating jetty	
		Construction/reconstruction of shores/piers	
		Remediation/reconstruction of existing devices and equipment	
		Installation of new devices and equipment	
		Remediation/reconstruction of existing facilities	
		Construction of new facilities	
	Increase/improvement of the capacity of the communal part of the port	Increase/improvement of the capacity of the communal part of the port	Possibility/need of increasing the capacity of the communal part of the port
			Capacity increase/improvement models
			Conversion of existing shores
			Setting up the floating jetty
			Construction/reconstruction of shores/piers
Remediation/reconstruction of existing devices and equipment			

Development criteria			
Group	Basic criteria	Sub-criteria	
		Installation of new devices and equipment	
		Remediation/reconstruction of existing facilities	
		Construction of new facilities	
		Arrangement of access roads and spaces for vehicles	
		Increase/improve the capacity of the fishing part of the port	Possibility/need to increase the capacity of the fishing part of the port
			Capacity increase/improvement models
			Conversion of existing shores
			Setting up the floating jetty
			Construction/reconstruction of shores/piers
			Remediation/reconstruction of existing devices and equipment
			Installation of new devices and equipment
			Remediation/reconstruction of existing facilities
			Construction of new facilities
			Arrangement of access roads and spaces for vehicles
		Increase/improve the capacity of the nautical part of the port	Possibility/need of increasing the capacity of the nautical part of the port
			Capacity increase/improvement models
			Conversion of existing shores
			Setting up the floating jetty
			Construction/reconstruction of shores/piers
			Remediation/reconstruction of existing devices and equipment
			Installation of new devices and equipment
			Remediation/reconstruction of existing facilities
			Construction of new facilities
			Arrangement of access roads and spaces for vehicles
		Improving transport connectivity	Traffic demand for regular shipping of passengers (classic and high-speed)
			Traffic demand for ro-ro transport
			Traffic demand for occasional passenger transport (tourist ships)
			Transport demand for seaplanes
		Traffic demand for freight transport	
	Improvement of protection against negative natural impacts and restrictions on the location of the port	Meteorological-oceanological conditions	
		Protection against the negative effects of winds	
		Protection against negative impacts of sea waves	
		Protection against the negative effects of tides	
		Protection against negative impacts of sea currents	
		Protection against negative fog influences	
		Navigation conditions	
		Reconstruction of the existing protective breakwater	
		Construction of a new protective breakwater	
		Deepening of the port area	
		Remediation/reconstruction of existing navigation port equipment	
		Installation of new navigation port equipment	
		Geographical conditions	

Development criteria		
Group	Basic criteria	Sub-criteria
SOCIAL ACCEPTABILITY AND SUSTAINABILITY	Improving the quality of port service	Potential for improving the port's equipment with basic facilities
		Potential for improving the port's equipment with additional facilities
		Potential for the development of value-added services in the port area
	Improving environmental protection, safety and energy efficiency	Provision of infrastructure, facilities and equipment for receiving waste from vessels
		Provision of specialized equipment and protective equipment in case of environmental incidents
		Mitigation of the risk of sudden events
		Improving energy efficiency
	Potential for the development of the gravitational area of the port	Impact on the development of gravity space - potential for attracting economic activities
	Improving the protection of the natural, cultural-historical and ambient values of port	The need for a certain level of protection of the port area in relation to basic port services
	Assessment of the level of investment and technical complexity of the planned requirements	Technical complexity of the requirements
Size of the required investment		

VALUATION RESULTS AND CLASSIFICATION OF PORTS ACCORDING TO THE EXISTING STATE

For the classification of ports according to the established classification criteria, i.e. according to the existing state, the PROMETHEE method of multi-criteria decision-making was used. (*Preference Ranking Organization Methods for Evaluation*). The basis of this method is the function of preference $P(a,b)$ which gives an expert assessment of the preference of port A over port B. For each pair (a,b) , a preference index is defined and so for each criterion. On the basis of the preference index, the so-called positive (output) and negative (input) flows are determined, which represent the sum of the respective multi-criteria preference indices. The higher the positive flow, the more dominant a particular location is compared to other locations. On the basis of the positive and negative flow, the ranking of the arc is determined by calculating *the so-called net flow according to the expression*:

The net values of the Phi variable range from 1 to -1, where when determining the value of the Phi+ port closer to the number 1 they represent a more acceptable or optimal choice, and by analogy, the ports closer to the value -1 represent a less optimal choice. Accordingly, a port that has a higher net stream is better ranked compared to a port with a lower net stream.

Metric determinants of multi-criteria decision-making are systematically presented, i.e. the values obtained by multi-criteria analysis aim to rank ports according to predefined and reasoned criteria and scenarios.

Weighting points are attached to all groups of criteria depending on the level of evaluation of each sub-criterion. In the total number of possible points, traffic-technical criteria are represented with 54%, while social criteria are represented with 46%.

Based on the criteria thus set, 14 ports were evaluated according to the existing state, where each classification sub-criterion is associated with an appropriate rating based on the evaluation criteria previously established. The results obtained are shown in Table 3.

Table 3- Rating of ports according to the set classification criteria

CLASSIFICATION CRITERIA	RATING OF PORTS ACCORDING TO THE SET CLASSIFICATION CRITERIA													
	Barić Draga	Cesarica	Donja Klada	Jablanac	Karlobag	Karlobag - cargo port	Krivača	Lukovo	Porat	Prizna	Senj	Starigrad	Stinica	Sveti Juraj
A) Traffic connections														
A.1.	1	1	1	1	1	1	1	1	1	2	1	1	2	1
A.2.	1	1	1	1	1	1	1	1	1	1	1	1	1	1
A.3.	1	1	2	2	2	2	1	2	1	1	3	2	1	2
A.4.	5	5	4	4	5	5	5	4	5	5	5	4	5	5
A.5.	1	1	1	1	1	1	1	1	1	1	1	1	1	1
B) Traffic capacity														
B.1.	1	1	1	2	2	1	1	1	3	3	5	1	4	2
B.2.	1	2	3	2	2	2	3	2	1	1	5	2	1	2
B.3.	1	1	1	1	1	1	1	1	1	1	1	1	1	1
B.4.	1	1	1	1	2	1	1	1	1	1	2	1	1	1
C) Availability of basic port infrastructure														
C.1.	1	2	2	2	2	2	2	1	5	1	3	1	3	2
C.2.	2	2	2	2	2	2	2	2	2	3	4	2	3	3
C.3.	1	1	1	4	2	1	1	1	3	3	1	1	4	2
C.4.	1	1	1	2	2	2	1	2	2	2	3	2	2	2
C.5.	1	1	1	1	1	1	1	1	1	1	1	1	1	1
C.6.	2	2	2	2	2	1	2	2	2	3	3	3	2	2
C.7.	1	1	1	1	1	1	1	1	1	2	1	1	2	1
D) Quality of basic port infrastructure														
D.1.	1	1	2	2	2	1	2	2	2	2	2	2	3	2
D.2.	2	2	2	3	3	1	3	3	3	4	4	3	5	4
D.3.	2	1	2	3	3	1	2	3	2	3	3	3	3	3
D.4.	2	3	3	4	5	2	2	4	3	5	5	3	5	4

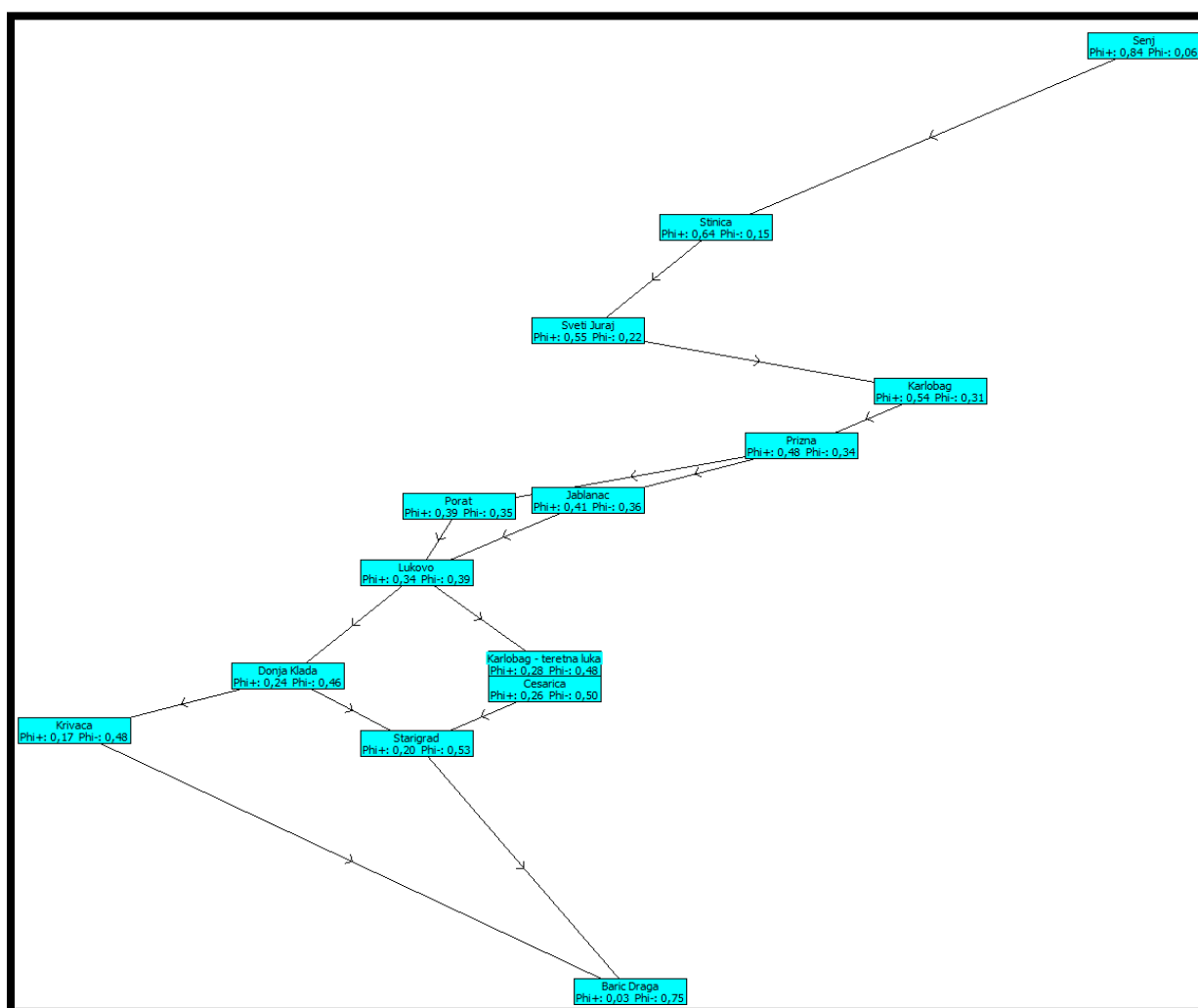
CLASSIFICATION CRITERIA	RATING OF PORTS ACCORDING TO THE SET CLASSIFICATION CRITERIA													
	Barić Draga	Cesarica	Donja Klada	Jablanac	Karlobag	Karlobag - cargo port	Krivača	Lukovo	Porat	Prizna	Senj	Starigrad	Stinica	Sveti Juraj
E) Additional port facilities capacity														
E.1.	1	2	1	1	2	2	1	1	5	1	3	1	4	1
E.2.	2	2	2	3	3	2	2	2	2	3	3	2	3	3
E.3.	1	1	1	1	1	1	1	1	1	2	1	1	2	2
E.4.	1	1	1	2	3	1	1	2	1	2	3	1	3	3
F) Safety and security of the port area														
F.1.	3	3	3	4	3	3	3	3	4	3	3	3	3	3
F.2.	3	3	3	3	2	2	3	3	2	3	3	3	3	3
F.3.	2	2	2	3	1	2	2	2	2	2	2	2	2	2
F.4.	2	2	2	3	2	3	3	3	2	3	3	2	3	3
G) Ecological equipment of the port														
G.1.	1	3	2	2	2	1	1	2	3	2	3	1	2	2
G.2.	1	1	1	1	1	1	1	1	1	1	1	1	2	1
G.3.	3	3	3	2	2	3	3	3	2	1	2	3	1	2
H) Location of the port														
H.1.	1	2	1	1	5	5	1	1	1	1	5	1	1	1
H.2.	3	4	4	4	5	5	2	4	2	2	5	4	2	5
H.3.	1	1	1	1	1	1	1	1	1	1	1	1	1	1
H.4.	1	1	1	1	1	1	1	1	1	1	1	1	1	1
H.5.	3	3	4	3	4	5	5	4	5	5	4	4	5	4
TOTAL	58	65	66	76	80	68	65	70	76	78	97	67	88	79

Using a multi-criteria analysis on the results of arc assessment according to classification criteria, i.e. according to the existing condition from Table 3, uniformly distributed weight coefficients were used. The results of the conducted analysis are shown in Table 4 and Graph 1.

Table 4 - Port ranking and net flows according to the results of multi-criteria analysis performed on the basis of evenly distributed weighting coefficients

Rank	action		Phi	Phi+	Phi-
1	Senj	<input type="checkbox"/>	0,7788	0,8365	0,0577
2	Stinica	<input type="checkbox"/>	0,4904	0,6442	0,1538
3	Sveti Juraj	<input type="checkbox"/>	0,3269	0,5481	0,2212
4	Karlobag	<input type="checkbox"/>	0,2308	0,5385	0,3077
5	Prizna	<input type="checkbox"/>	0,1442	0,4808	0,3365
6	Jablanac	<input type="checkbox"/>	0,0577	0,4135	0,3558
7	Porat	<input type="checkbox"/>	0,0481	0,3942	0,3462
8	Lukovo	<input type="checkbox"/>	-0,0577	0,3365	0,3942
9	Karlobag - teretna luka	<input type="checkbox"/>	-0,2019	0,2788	0,4808
10	Donja Klada	<input type="checkbox"/>	-0,2212	0,2404	0,4615
11	Cesarica	<input type="checkbox"/>	-0,2404	0,2596	0,5000
12	Krivaca	<input type="checkbox"/>	-0,3077	0,1731	0,4808
13	Starigrad	<input type="checkbox"/>	-0,3269	0,2019	0,5288
14	Baric Draga	<input type="checkbox"/>	-0,7212	0,0288	0,7500

Graph 1 - Port ranking according to the results of a multi-criteria analysis carried out on the basis of evenly distributed weighting coefficients



Based on the results obtained in Table 4 and Graph 1, it can be concluded that aggregate values have been obtained that cover several different characteristics of the current state of the ports, and can therefore be interpreted and understood in a number of ways. However, they have in common that they have greater value, that is, a positive flow, ports that are better connected by traffic, they have greater traffic capacity, greater availability of port infrastructure, higher quality basic port infrastructure, greater port facilities capacity, safer and more protected port area, better eco-equipment and/or more attractive location. The ports of Senj, Stinica, Sveti Juraj, Karlobag, Prizna, Jablanac and Porat belong to the category of positive-flow ports based on the obtained results from Table 4 and Graph 1. Opposite them are ports that have a negative flow, i.e. whose existing state is not entirely satisfactory. Consequently, ports with a total negative flow need special attention in order to clearly define their basic task on the one hand, and to improve the existing port infrastructure and supra-infrastructure and their overall characteristics on the other. The negative-flow ports include the ports of Baric Draga, Stangrad, Krivača, Cesarica, Donja Klada, Karlobag - cargo port and Lukovo.

At the same time, these data can serve as guidance in which direction improvements should be made in order to make each port more ranked in the total port system of ports open to public traffic of county and local importance, which are under the management of the Port Authority of Senj.

In addition, for the purpose of better analysis and more accurate interpretation of the characteristics of the existing state of ports, additional multicriteria analyses were conducted in the master plan based on classification criteria where greater emphasis was always placed on one of the eight basic criteria. The results of the evaluations of the ports according to the mentioned multi-criteria analyses are elaborated in detail in the master plan.

DEVELOPMENT CRITERIA AND GUIDELINES FOR PORT PLANNING

The development of ports and port systems, and in particular the development of ports open to public traffic of county and local importance, is based on the view of their developmental role in the overall economic and social life of the region and the local community. Such an approach to looking at the development direction through the role of the port in the totality of economic development requires planning the development of the port in accordance with the planned economic development of the environment, i.e. the port gravity zone of each port.

The functional approach to the development of the port is based on the concept of the multiplier effect of the port, which is manifested in the way that the port is a generator of socio-economic development of the surrounding area, i.e. economic and non-economic activities in the environment.

The basic functional development directions of ports open to public traffic of county and local importance, i.e. the main directions of port development in order to improve the development of the local and wider regional community, are as follows:

- port in the function of public long-distance regular transport, including air transport,
- port in the function of communal needs (communal berths),
- port in the function of fisheries (fishing berths),
- port in the function of nautical tourism (nautical berths),
- port as a key point (link) on the traffic route,
- port as the center of an urban place (cultural and historical heritage) and
- port in industrial function.

Based on the previously conducted research and for the purpose of preparing the master plan for the development of ports open to public traffic of county and local importance, which are under the management of the Port Authority of Senj, an analysis of the spatial and functional characteristics of ports was performed from the point of view of:

- accommodation of the port in the construction area,
- traffic connection of the port with the hinterland,
- the structure and circumferential contents with which the port borders, with particular emphasis on possible conflicts in space and

- public facilities in the function of the port.

In addition, for each port, the port area itself, i.e. its spatial and functional characteristics within the port area itself, was analyzed, in particular:

- boundaries and areas of the port area,
- structure of the port area by purpose,
- valorisation of the land and sea part of the port,
- characteristics of the port infrastructure and supra-infrastructure,
- the scope of the accompanying content in the function of the basic port activities and
- the degree of assurance of the prescribed standards.

In addition, an analysis of the Spatial Plan of the Lika-Senj County was carried out, as well as the spatial plans of the Town of Senj and the Municipality of Karlobag. For the purposes of this brief summary, only the proposal of possible guidelines for the development of the port of Senj is presented below, while for all other ports under the management of the Port Authority of Senj, the development guidelines are shown in the master plan.

PORT OF SENJ

The port area of the port of Senj is proposed to be arranged in accordance with the determined demand for port services, legal obligations, but also the requirements from the spatial planning documentation, i.e. the necessary capacities in certain parts of the port.

The proposed structure of the port area is presented according to the basic purpose of each part of the port, as well as according to the planned activities that will be able to be performed within each part of the port area (Figure 1).

Figure 1 - Structure proposal for the port area of the port of Senj



In order to protect the port area, it is proposed to build two protective breakwaters according to Figure 1, which will achieve better and safer maritime conditions in the entire port area, but also provide additional port capacities for operational needs and mooring of nautical yachts/boats.

In the communal part of the port, it is necessary to build new communal piers in order to provide additional port facilities for mooring communal boats in the most protected part of the port area. In the realization of the planned activities, it is necessary to build and equip the port with the following facilities:

- three new communal piers,
- a new boat landing site and the transfer of the port crane to a new location and
- installation of equipment and devices for safe mooring of communal boats.

Within the port area, it is planned to convert a part of the port from a communal to a nautical purpose, i.e. the part of the coast that has been foreseen for mooring nautical yachts/boats so far will be further expanded. It is also planned to build three new nautical piers and a southern protective breakwater within which additional port facilities will be provided for mooring nautical yachts/boats on its inside. In the realization of the planned activities, it is necessary to build and equip the port with the following facilities:

- three new nautical piers,
- power and water connections,
- reception and supervision facility,
- sanitary fixture with washing and drying machines and
- installation of equipment and devices for safe mooring of nautical yachts/boats.

The following port infrastructure must be built in order to carry out the basic activity in the operational part of the port:

- a new protective northern breakwater to be used on the inside for operational purposes, i.e. as a fishing landing site,
- extend the existing operating pier of St. Nicholas,
- a new ro-ro ramp at the bottom of the northern part of the port area and
- equipping and arranging a fishing landing site with accompanying facilities.

This will provide the basic infrastructure for ferry traffic on the relation Senj (mainland) - Baška (island Krk), additional port capacities for the needs of tourist-tour ships, but also an operational space for the needs of fish transshipment.

Additional port facilities such as a landscaped plateau for the repair and washing of yachts/boats with a wastewater purifier and a landscaped plateau for the winter resort of boats are planned outside the existing harbour area in the economic zone of the city of Senj due to the exceptional social and urban value of the harbour area itself located in the very center of the city.

VALUATION RESULTS AND CLASSIFICATION OF PORTS ACCORDING TO DEVELOPMENT CRITERIA

For the evaluation and classification of ports according to the established development criteria, the PROMETHEE method of multi-criteria decision-making was also used, as well as for classification criteria. However, for developmental criteria, the weighting points assigned to individual groups of criteria are assigned in a different ratio. In the total number of possible points, traffic-technical criteria are represented in the range of 67 to a maximum of 77%, while social criteria are represented in the range of 23 to a maximum of 33%.

Based on the criteria thus set, 14 ports were evaluated according to the projected state, i.e. according to the presented spatial-planning planning of the ports, where each development sub-criterion is associated with an appropriate assessment based on the evaluation criteria previously determined. The results obtained are shown in Table 5.

Table 5 - Evaluation of ports according to the set development criteria based on the proposed development projects

DEVELOPMENT CRITERIA	EVALUATION OF PORTS ACCORDING TO THE SET DEVELOPMENT CRITERIA BASED ON THE PROPOSED DEVELOPMENT PROJECTS													
	Barić Draga	Cesarica	Donja Klada	Jablanac	Karlobag	Karlobag - cargo port	Krivača	Lukovo	Porat	Prizna	Senj	Starigrad	Stinica	Sveti Juraj
A) Increase/improve the capacity of the operational part of the port														
A.1.	1	1	2	1	1	2	1	2	1	2	4	2	1	1
A.2.	0	0	3	0	0	3	0	4	0	2	6	2	0	1
B) Increase/improvement of the capacity of the communal part of the port														
B.1.	3	3	3	2	3	3	1	2	1	3	3	2	3	3
B.2.	5	5	7	3	2	5	2	4	3	3	5	4	2	5
C) Increase/improve the capacity of the fishing part of the port														
C.1.	1	1	1	2	1	1	1	1	1	1	4	1	1	1
C.2.	0	0	0	3	0	0	0	0	0	0	4	0	0	0
D) Increase/improve the capacity of the nautical part of the port														
D.1.	3	3	3	2	4	1	4	3	3	2	4	3	3	3
D.2.	5	5	5	3	5	0	6	4	6	2	5	4	5	6
E) Improving transport connectivity														
E.1.	1	1	1	1	1	1	1	1	1	1	4	1	1	1
E.2.	1	1	1	1	1	1	1	1	1	1	5	1	1	1
E.3.	1	1	3	4	4	1	1	3	1	1	4	3	1	3
E.4.	1	1	1	1	1	1	1	1	1	1	1	1	1	1
E.5.	1	1	1	1	1	2	1	1	1	1	1	1	1	1
F) Improvement of protection against negative natural impacts and restrictions on the location of the port														
F.1.	2	2	2	0	3	0	0	2	0	2	2	2	2	2
F.2.	2	2	2	0	5	1	1	4	2	2	3	2	2	2
F.3.	2	4	3	1	1	4	4	3	4	1	5	3	4	3

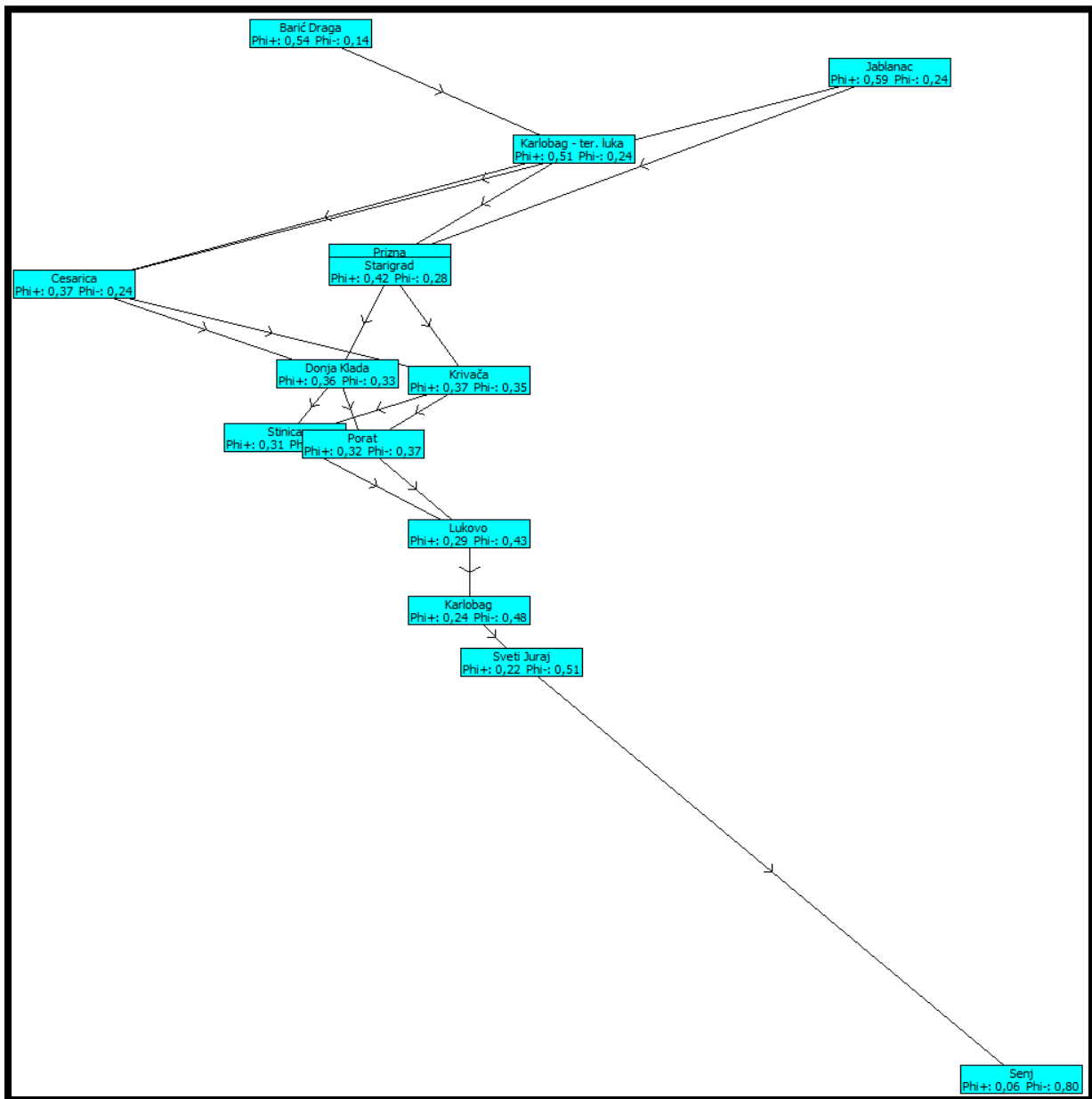
DEVELOPMENT CRITERIA	EVALUATION OF PORTS ACCORDING TO THE SET DEVELOPMENT CRITERIA BASED ON THE PROPOSED DEVELOPMENT PROJECTS													
	Barić Draga	Cesarica	Donja Klada	Jablanac	Karlobag	Karlobag - cargo port	Krivača	Lukovo	Porat	Prizna	Senj	Starigrad	Stinica	Sveti Juraj
G) Improving the quality of port service														
G.1.	3	3	3	2	4	3	4	3	4	3	5	3	3	4
G.2.	3	3	3	2	4	3	4	3	4	3	5	3	3	4
G.3.	2	3	3	2	4	2	3	3	3	3	5	3	3	3
H) Improving environmental protection, safety and energy efficiency														
H.1.	1	1	1	2	2	1	2	1	2	2	3	1	2	2
H.2.	1	1	1	1	1	1	1	1	1	3	2	1	3	2
H.3.	1	1	1	1	1	1	1	1	1	2	2	1	2	1
H.4.	1	1	1	1	1	1	1	1	1	1	1	1	1	1
I) Potential for the development of the gravitational area of the port														
I.1.	1	2	2	2	3	2	4	3	3	2	4	2	3	3
J) Improving the protection of the natural, cultural-historical and ambient values of port														
J.1.	4	5	4	4	4	5	5	5	5	5	4	4	5	4
K) Assessment of the level of investment and technical complexity of the planned requirements														
K.1.	3	3	3	2	5	2	3	4	5	3	5	4	4	5
K.2.	3	3	3	2	5	2	3	4	5	3	5	4	4	5
TOTAL	52	57	63	46	67	49	56	65	60	55	101	59	61	68

Using multi-criteria analysis on the results of ports assessment according to development criteria, i.e. according to the projected state from Table 5, uniformly distributed weight coefficients were used. The results of the conducted analysis are shown in Table 6 and Graph 2.

Table 6 - Port ranking and net flows according to the results of multi-criteria analysis performed on the basis of evenly distributed weighting coefficients

Rank	action		Phi	Phi+	Phi-
1	Barić Draga	<input type="checkbox"/>	0,3986	0,5385	0,1399
2	Jablanac	<input type="checkbox"/>	0,3566	0,5944	0,2378
3	Karlobag - ter. luka	<input type="checkbox"/>	0,2727	0,5105	0,2378
4	Prizna	<input type="checkbox"/>	0,1538	0,4266	0,2727
5	Starigrad	<input type="checkbox"/>	0,1399	0,4196	0,2797
6	Cesarica	<input type="checkbox"/>	0,1259	0,3706	0,2448
7	Donja Klada	<input type="checkbox"/>	0,0280	0,3566	0,3287
8	Krivača	<input type="checkbox"/>	0,0210	0,3706	0,3497
9	Stinica	<input type="checkbox"/>	-0,0420	0,3147	0,3566
10	Porat	<input type="checkbox"/>	-0,0490	0,3217	0,3706
11	Lukovo	<input type="checkbox"/>	-0,1469	0,2867	0,4336
12	Karlobag	<input type="checkbox"/>	-0,2308	0,2448	0,4755
13	Sveti Juraj	<input type="checkbox"/>	-0,2867	0,2238	0,5105
14	Senj	<input type="checkbox"/>	-0,7413	0,0629	0,8042

Graph 2 - Port ranking according to the results of a multi-criteria analysis carried out on the basis of evenly distributed weight coefficients



Based on the results obtained in Table 6 and Graph 2, it can be concluded that aggregate values were obtained that cover several different characteristics of the planned state of the ports, and can therefore be interpreted and understood in a number of ways. However, they have in common that ports that require a lower level of investment in port infrastructure and supra-infrastructure, which is primarily related to the limited potential in increasing port capacity, but also to the limitations in the possibilities of improving the quality of port services. The category of ports with positive flow based on the obtained results from Table 6 and Graph 2 includes the ports Baric Draga, Jablanac, Karlobag - cargo port, Prizna, Starigrad, Cesarica, Donja Klada and Krivača. Opposite them are ports that have a negative flow, i.e. whose planned state provides greater development opportunities in terms of improving port infrastructure and supra-infrastructure, but also increasing the quality of port services. However, such scenarios also require a higher level of investment, which will undeniably positively affect the satisfaction

of port users. Port of Senj, Sveti Juraj, Karlobag, Lukovo, Porat and Stinica belong to the category of ports with negative flow.

The results obtained from the multicriteria analysis carried out on the basis of the development criteria can serve as initial guidance to the Port Authority in the prioritisation of investment project planning. Similarly, the selection of an investment can predict benefits for the Port Authority, but also for the targeted port users.

In addition, in order to better analyze and more accurately interpret the development criteria in the spatial-planning of ports, additional multicriteria analyses were conducted in the master plan, based on placing greater emphasis on one of the eleven defined development criteria. The results of the evaluations of the ports according to the mentioned multi-criteria analyses are elaborated in detail in the master plan.

ANALYSIS AND EVALUATION OF DEVELOPMENT SCENARIOS OF PORTS

The development of ports open to public traffic of county and local importance is based on their basic role and function within the Croatian port system. The natural location and economic environment largely defines their basic direction of sustainable development, however, the implementation of socially justified investments in port infrastructure and supra-infrastructure can significantly contribute to the improvement of the economic and social life of the region and the local community where these ports are located. It is therefore of utmost importance to look at the basic functional directions towards which ports can develop.

The basic functional development directions of ports open to public traffic of county and local importance are aimed at fulfilling one basic goal, which is to improve the development of the local and wider regional community. In doing so, ports may perform one or more of the basic port functions such as enabling public long-distance regular transport, providing communal, fishing and/or nautical berths, allowing occasional coastal transport to take place, ensuring cargo transshipment, but also social and economic activities to take place. However, all port functions need to be sublimated in several basic development directions according to which they can be developed, so to this end, four basic development scenarios are specified, as follows:

Scenario 1 - development of ports aimed at ensuring transport connectivity and public regular passenger transport, including air transport,

Scenario 2 - development of ports focused on tourism activities and ensuring access for nautical tourism vessels,

Scenario 3 - development of ports focused on traditional communal activities and ensuring a higher quality of services for the local population and

Scenario 4 - development of port that is in the function of protecting natural, cultural-historical and ambient values.

Different development scenarios are directed towards different groups of end-users of port services, therefore the main groups of end-users are listed below depending on the particular development scenario, as follows:

Scenario 1 - targeted port users are passengers, i.e. users of public long-distance regular transport services (local residents, businessmen, tourists, etc.),

Scenario 2 - targeted port users are tourists, i.e. users of nautical berths, users of occasional coastal transport (tourist ships, cruise ships, etc.),

Scenario 3 - targeted port users are local residents, fishermen and other small and medium-sized enterprises in traditional activities related to the communal use of the port area and

Scenario 4 - target port users are local residents of local self-government units.

Considering the above basic development roles and functional orientation of ports open to public traffic of county and local importance and with regard to the four basic development scenarios, and for the totality of evaluation and implementation of comparative analysis of development potentials and services of each port, it is necessary to unambiguously and generally applicable to determine the basic parameters for their evaluation, which also represent key development characteristics in economic and non-economic terms. For this reason, the already set development criteria of ports from the previous chapters were taken into account, which assigned the following weight values in relation to each development scenario of ports:

- 1 (low weight value),
- 2 (mean weight value) and
- 3 (high weight value).

In accordance with the set different levels of weight values and different guidelines of each development scenario, Table 7 shows the assigned weight values to each individual development criterion.

Table 7 - Assigned weight values according to four set scenarios

DEVELOPMENT CRITERIA	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Increase/improve the capacity of the operational part of the port	3	3	1	1
Increase/improvement of the capacity of the communal part of the port	1	1	3	2
Increase/improve the capacity of the fishing part of the port	1	1	3	2
Increase/improve the capacity of the nautical part of the port	1	3	1	2
Improving transport connectivity	3	2	1	1
Improvement of protection against negative natural impacts and restrictions on the location of the port	3	2	3	1
Improving the quality of port service	1	3	1	3
Improving environmental protection, safety and energy efficiency	2	2	2	3
Potential for the development of the gravitational area of the port	3	3	1	2

DEVELOPMENT CRITERIA	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Improving the protection of the natural, cultural-historical and ambient values of port	1	2	2	3
Assessment of the level of investment and technical complexity of the planned requirements	3	3	1	1

Each individual development scenario is directed towards different functional goals, i.e. towards different users of port services, and therefore the weight values of the evaluation of development criteria according to Table 7 are distributed differently. Based on the criteria thus set, a multi-criteria evaluation of each individual scenario was performed.

For the purposes of multi-criteria evaluation of development scenarios of ports, the PROMETHEE method was also used, as in previous multi-criteria analyses of classification and development criteria. However, for the purposes of evaluating the development scenarios of ports, four basic scenarios were used which assign different weight values to the development criteria.

The results of the evaluation in accordance with the set criteria are shown below for each individual scenario.

1) Scenario 1 - development of transport connectivity of ports

According to scenario 1, the development of ports is aimed at ensuring transport connectivity and public regular passenger transport, which includes air transport. The target users of port services are passengers in public long-distance regular transport.

In accordance with the obtained results, the positive flow is shown by ports that have the possibility of improving the level of their transport connectivity, i.e. increasing their operational capacities. The positive-flow ports include the ports of Senj, Karlobag, Sveti Juraj, Lukovo, Stinica and Porat. The negative flow is expressed by ports that do not have reasonable opportunities to improve their transport connectivity, i.e. they do not have the possibility to increase their operational capacities. The negative-flow ports include the ports of Barić Draga, Jablanac, Karlobag - cargo port, Cesarica, Prizna, Krivača, Starigrad and Donja Klada.

2) Scenario 2 - development of port tourism activities

According to scenario 2, the development of ports is aimed at developing tourism activities and ensuring access for nautical tourism vessels. Targeted users of port services are tourists and boaters.

In accordance with the results obtained, ports with the possibility of improving their port services focused on tourism activities, but also on ensuring better access for nautical tourism vessels, show a positive flow. The positive-flow ports include the ports of Senj, Sveti Juraj, Karlobag, Lukovo, Porat, Krivača and Stinica. The negative flow is expressed by ports that have a limited opportunity to improve their tourist attractiveness, or that do not have the possibility to significantly increase their nautical capacities. The negative-flow ports include the ports of Barić Draga, Jablanac, Karlobag - cargo port, Prizna, Cesarica, Starigrad and Donja Klada.

3) Scenario 3 - development of port utilities

According to scenario 3, the development of ports is aimed at developing traditional communal activities and ensuring a higher quality of services for the local population. The target users of port services are local residents and fishermen.

In accordance with the obtained positive flow, ports that have the ability to improve their port capacities in the communal parts of the port, but also to provide better quality port services for communal users. The positive-flow ports include the ports of Senj, Sveti Juraj, Lukovo, Karlobag, Stinica, Donja Klada and Cesarica. The negative flow is reflected in ports that have a limited possibility to improve their services in the communal parts of the ports, or that do not have the possibility to significantly increase their communal capacities. Ports Jablanac, Barić Draga, Karlobag - cargo port, Krivača, Prizna and Porat are in the category of ports with negative flow.

4) Scenario 4 - development of protection of cultural-historical and ambient values of ports

According to scenario 4, the development of ports is aimed at the protection of the natural, cultural-historical and ambient values of the ports. The target users of port services are the local population of local self-government units.

In accordance with the obtained positive flow are the ports that have a significant need to protect the natural, cultural-historical and ambient values of the ports. The positive-flow ports include the ports of Senj, Sveti Juraj, Karlobag, Krivača, Porat, Stinica and Lukovo. The negative flow is expressed by ports that have a small or moderate need to protect the natural, cultural-historical and ambient values of the ports. The negative-flow ports include the ports of Barić Draga, Jablanac, Karlobag - cargo port, Starigrad, Donja Klada, Cesarica and Prizna.

CONCLUSION

Sustainable development of ports open to public traffic of county and local importance is of utmost importance for every county, its economy, but also for its inhabitants. The port authorities that manage their development assume an important social, economic and social responsibility. Therefore, their long-term planning is a fundamental foundation in the strategic achievement of the objectives of ensuring adequate port capacity and core port functions.

To this end, the Port Authority of Senj has commissioned the development of a master plan for the development of ports open to public traffic of county and local importance under its administration. The Port Authority of Senj manages 14 ports, of which 5 ports are open to public traffic of county importance: the port of Jablanac, the port of Karlobag, the port of Prizna, the port of Senj and the port of Stinica, and 9 ports open to public traffic of local importance: the port of Barić Draga, the port of Cesarica, the port of Donja Klada, the port of Karlobag - cargo port, the port of Krivača, the port of Lukovo, the port of Porat, the port of Starigrad and the port of Sveti Juraj.

Existing port capacities generally meet the minimum needs of port users, but there is a greater or lesser need to increase port capacities in almost all ports. Increasing port capacity is most necessary

in terms of communal and nautical berths, which are deficient in almost all ports, and berths in a large number of ports do not meet the standards of mooring from the point of view of maritime safety and additional services that should be available to all vessels. It can generally be concluded that mooring standards can be rated as average.

In addition, the existing port infrastructure and supra-infrastructure is predominantly characterized by individual construction and dysfunctional exploitation of the port area. Also, most ports do not have adequate protection of the port area, so they are more or less open to the influence of wind and waves.

For the purpose of developing this Master plan for the development of ports under the management of the Port Authority of Senj, field and office research was conducted on all major factors that may affect their development. The valid legal regulations, strategic documents and spatial planning documentation were analyzed. A detailed analysis of all ports was made and their current state was assessed.

In order to set relevant criteria for evaluating ports open to public traffic of county and local importance, two basic criteria have been established which describe in more detail the general objectives and orientation of port development, namely: traffic-technical functionality and social acceptability and sustainability. These two basic criteria define and explain sub-criteria that define basic criteria in more detail. On the basis of the set criteria, the PROMETHEE method of multi-criteria analysis was performed and on the basis of the obtained results, the classification of all ports was performed. The results of the conducted analysis indicate that ports with a negative overall flow should be given special attention in order to clearly define their basic task on the one hand, and to ensure their full functionality in relation to the set task on the other hand.

As part of the spatial planning of ports under the management of the Port Authority of Senj, drafts of port areas with planned functions were prepared. This took into account the guidelines from the available spatial planning documentation, as well as the conclusions that were based on the collected data on the required needs for the provision of port service by individual ports.

For the purpose of establishing the criteria for planning the development guidelines of ports open to public traffic of county and local importance, the main development directions aimed at improving the local and regional community have been established, as follows:

- port in the function of public long-distance regular transport, including air transport,
- port in the function of communal needs (communal berths),
- port in the function of fisheries (fishing berths),
- port in the function of nautical tourism (nautical berths),
- port as a key point (link) on the traffic route,
- port as the center of an urban place (cultural and historical heritage) and
- port in industrial function.

However, for the purposes of evaluating individual criteria, four possible scenarios of port development were set up, namely:

- the development of ports aimed at ensuring transport connectivity and public regular passenger transport, including air transport,
- development of ports aimed at tourism activities and ensuring access for nautical tourism vessels,
- development of ports aimed at traditional communal activities and ensuring a higher quality of services for local residents and
- development of the port, which is in the function of protecting natural, cultural-historical and ambient values.

To evaluate each of the four previously established development directions or scenarios, development criteria were set in eleven sub-criteria, which were assigned different weight values in accordance with the basic guidelines of each individual scenario. The evaluation of the set development scenarios was performed using the preference function using the multi-criteria decision-making method. The results of the analysis indicate that the most likely development guidelines for the development of ports in the function of traffic connection according to scenario 1 for the ports of Senj, Karlobag and Sveti Juraj, for the development of ports in the function of nautical tourism according to scenario 2 for the ports of Senj, Sveti Juraj and Karlobag, for the development of ports in the function of communal activities according to scenario 3 for the ports of Senj, Sveti Juraj and Lukovo and for the development of ports in the function of protecting natural, cultural-historical and environmental values for the ports of Senj, Sveti Juraj and Karlobag.

Development scenarios may be different from those proposed in this master plan, but in any case they must take into account the spatial-planning constraints and functional requirements presented in this study.

The results of the research presented in this Master plan for the development of ports open to public traffic of county and local importance of the Port Authority of Senj will create the basic foundations for the future development of all ports under its administration. It will also enable quality preparation of the necessary project documentation necessary for the implementation of the proposed infrastructure and supra-infrastructure projects. The implementation and implementation of the proposed projects will improve all port areas to the satisfaction of the local population, users of port services, as well as Lika-Senj County.