

(D.4.1.4) Analysis of nautical tourism ports in Dubrovnik-Neretva County

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Executive Summary

Maritime and Multimodal Sustainable passenger transport solutions and services (MIMOSA) is a project within the cross-border cooperation Programme INTERREG Italy - Croatia, with an eligible area along the Italian and Croatian Adriatic coasts. The purpose of the project is to increase multimodality and improve services to enable accessibility, low-carbon and sustainable passenger mobility throughout the Programme area. To this purpose, the applicable goal of the project is to increase knowledge about passenger transport, to encourage changes in passenger behavior and to improve multimodal sustainable passenger connections in nautical tourism. Within the Work Package 4 (WP4), Dubrovnik - Neretva County implements the "Analysis of nautical tourism ports in Dubrovnik - Neretva County" with the main goal of valorization of the planned nautical tourism ports in the spatial planning documents of Dubrovnik - Neretva County. This document is in accordance with appropriate legal, environmental, economic, organizational, and technological and the technical level including intermodal analysis as a direct link to the use of other modes of transport, primarily bicycles.

The subject of the study are nautical tourism ports with their development possibilities and influences on the quantitative development of tourist offers of Dubrovnik-Neretva County with the ultimate goal of multidimensional analyzes of each planned nautical tourism ports individually in the spatial plan of Dubrovnik-Neretva County.

1. The context of nautical tourism in Croatia and Dubrovnik Neretva County

The Adriatic Sea is a bay of the Mediterranean Sea deeply indented in the European mainland in the direction southeast (SE) northwest (NW), 870 km long and with an average width of 159.3 km. The total length of the Croatian coast, including the coast of the island, is 6,175 km, and the air distance of the southernmost and northernmost point is 526 km. The ratio of these two numbers indicates a large coast indentation. Along the coast, there are 79 islands, 525 islets and 642 rocks with a total area of 3,259 km².

The Adriatic has a modified Mediterranean climate. The main features of the Adriatic climate are warm and dry summers and mild and wet winters. The transition period of autumn and spring is characterized by both summer and winter but less pronounced, the second part of spring and the first part of autumn are close to summer, and the first part of spring and the second part of autumn are somewhat closer to winter. The warm part of the year is thus longer and the cold part shorter. The average annual air temperature in the Adriatic ranges from 14° C in the northern part to 18° C

in the southern part. In summer July is the warmer month, with average air temperature between 22° and 26° C. The difference in air temperature between the northern and southern Adriatic is much smaller in summer than in winter. Maximum temperatures rarely reach 32 to 35 C, and the highest temperature is usually a few days.

Wind force with more than six Beauport's alongside coast are averagely 52 days, and more frequent during late autumn, winter and early spring.

Sea currents and tides are not significant and do not influence sailing.

The Croatian coast is administratively divided into seven counties (regional self-government unit).

Picture 1: Administrative division of the Croatian coast



Source: <https://www.kroatien-gastgeber.com/landkreise.html> 15.02.2021.

Comparing counties of the northern and central Adriatic with Dubrovnik-Neretva county in terms of distance, we may conclude that northern counties are physically closer to tourist emitting regions as

well as better road connected with A1 highway, then Dubrovnik – Neretva county. Road traffic participates in the arrival of boaters in the Republic of Croatia with about 60%. Rail traffic in passenger tourist traffic is negligible, while air traffic participates in the arrival of boaters with about 24%.

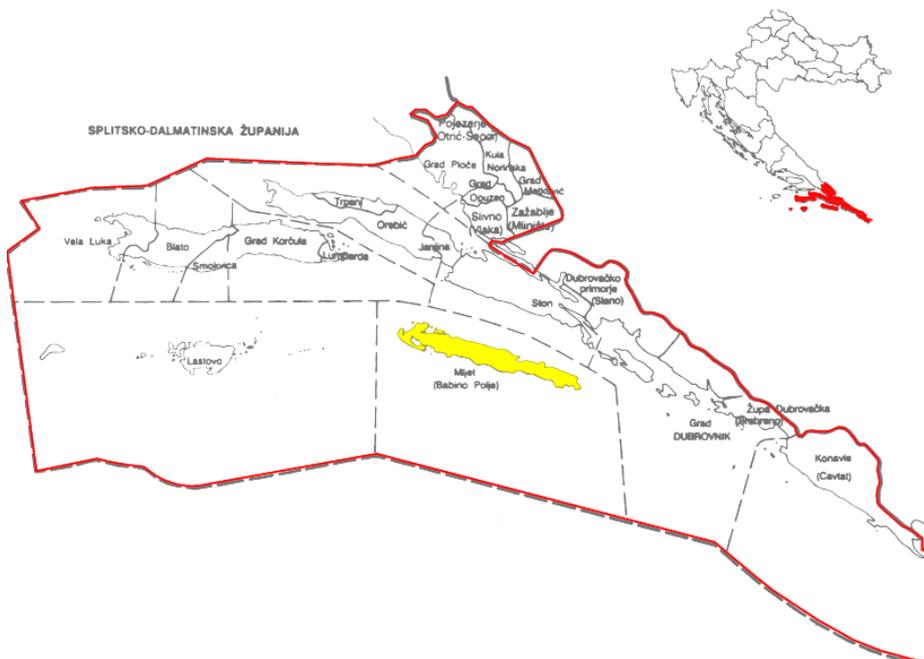
The legal framework of nautical tourism in the Republic of Croatia is defined by legal regulations and strategies in the field of tourism, maritime transport, environmental protection and spatial planning as well as other applicable regulations on management.

Geographical position and traffic connections, coastal morphology, climatic and oceanographic conditions as well as regulated legislation provide opportunities for the development of nautical tourism on the Croatian coast, while leaving the directions of development to the regional self-government units.

Dubrovnik-Neretva County is the southernmost and thus the furthest from the emitting tourist regions of all counties in Croatia. It covers 3.1% of the land territory and 24.1% of the sea area of Croatia.

Administratively is organized in 22 local self-government units, i.e. 5 cities (Dubrovnik, Korčula, Ploče, Metković and Opuzen) and 17 municipalities.

Picture 2: Dubrovnik - Neretva County - position in the Republic of Croatia and local government units



Source: Mljet municipality spatial plan

The coastal terrain of the County is similar to the majority of the rest of the Croatian coast with the same, Dinaridi's mountain direction of extension in the northwest southeast and a parallel islands, forming inland waterways. A more significant part of the coastline of Konavle, the southern coasts of Elafiti archipelago, Mljet and Lastovo are the so-called "high shores" made up of cliffs with a steep inclines.

The length of the coast of Dubrovnik Neretva County, including the islands, totals 1,024.63 km or about 19% of the total length of the Croatian coast with islands. The total length of the coastline of inhabited islands is 420.5 km or 11.76% of the length of the coast of all islands in Croatia.

According to the 2011 census, there were 122,568 inhabitants in Dubrovnik Neretva County with an average age of 41.5 years. Population of regional administrative center Dubrovnik is 42,615. The county includes six inhabited islands with 18,233 inhabitants. The most populated islands are Korčula, Mljet and Lastovo with 15,522, 1,088 and 792 inhabitants respectively.

Dubrovnik-Neretva County is connected to the rest of Croatia and Europe by road, rail, sea and air. The most important road connection is the highway A1 Zagreb - Ploče, continuing as the Adriatic tourist road (D8) to the border with Montenegro. The road passes through the Neum Corridor (BiH), where border crossings slowing down traffic, especially during the tourist season. The problem of the border crossing will be overcome by the completion of the construction of the Pelješac Bridge and the road route across Pelješac in 2022. The completion of the bridge will significantly improve the road connection to the Peljesac peninsula and the islands of Korcula, Mljet and Lastovo, providing an opportunity for their development, as well.

In town of Ploče, the county is connected to Central Europe by the railway for international transport of passengers and goods, but this transport route does not have a significant impact on passenger transport, due to poor railway infrastructure in Bosnia and Herzegovina.

County is via Dubrovnik - Čilipi airport connected with 26 states and 60 destinations on annual level. In maritime traffic, there are two international ports of state significance, Dubrovnik - Gruž passenger port with dominating cruise passengers, and Ploče mostly cargo port and ferry to Pelješac. In addition, there are eight other ports of county significance and 78 of local importance. Out of the total number of ports or separate port basins, 97 of them are open for public traffic.

High-speed boat seasonal connections with Split via island's ports and ferry connections with the Italian port of Bari characterize the maritime connection of the Dubrovnik-Neretva County with the rest of the Croatia and Europe.

The area of Dubrovnik - Neretva County has the characteristics of a Mediterranean climate. Summers are hot with periods of drought, and other seasons with rainfall that is more abundant and moderate temperatures. The highest annual temperatures are up to 34 ° C in July or August.

Frosts are very rare on the islands and southern mainland exposures, while in areas exposed to strong bura winds (NE wind) during January, the air temperature can drop to -7°C overnight.

The Dubrovnik area is located on the edge of a belt dominated by a subtropical type of annual precipitation. The highest amount of precipitation is at the transition from autumn to winter, due to cyclonic activity, causing heavy precipitation, an average of 200 mm in December. In summer, the dominant influence is a subtropical anticyclone with the lowest average rainfall of 35 mm. In the area of Dubrovnik, it is on average 313 days windy and 52 days quiet. On average, wind force six by Beauforts scale blows 88 days a year, mostly in December, and least in June and August. There are on average 10 stormy days with wind force more than eight Beaufort's scale, usually always during late autumn or winter.

Spatial plans, the county development strategy, and the Tourism Development Strategy cover the legal context of nautical tourism at Dubrovnik Neretva County.

Dubrovnik Neretva County has the lowest share of yachts berths in Croatia coastal counties, despite their increase in the past 10 years. The number of nautical tourism yachts on long-term berths lease has a declining trend with a simultaneously growing trend of vessels in transit and increase in their average length.

Dubrovnik Neretva County has favorable meteorological and oceanographic conditions, national and nature parks, numerous cultural value and world famous tourist brands Dubrovnik and Korčula as attractors of nautical tourism. Unfavorable factors in development of nautical tourism are primarily the distance from emitting markets compared to other coastal countries and poor transport connections, mainly oriented to air traffic, as well as steep cliffs on outer shoreline of the islands.

Long term development of nautical tourism ports has been considered in strategies related to tourism, maritime, spatial planning and environmental protection. According to Croatian legislation, the sea and shore are defined as maritime domain and possession for the purpose of exploitation can be granted only on concessions base. In Dubrovnik Neretva County, it is planned to have 38 different types of nautical tourism ports with maximum capacity of 80 – 400 berths and total capacity up to 7030 berths.

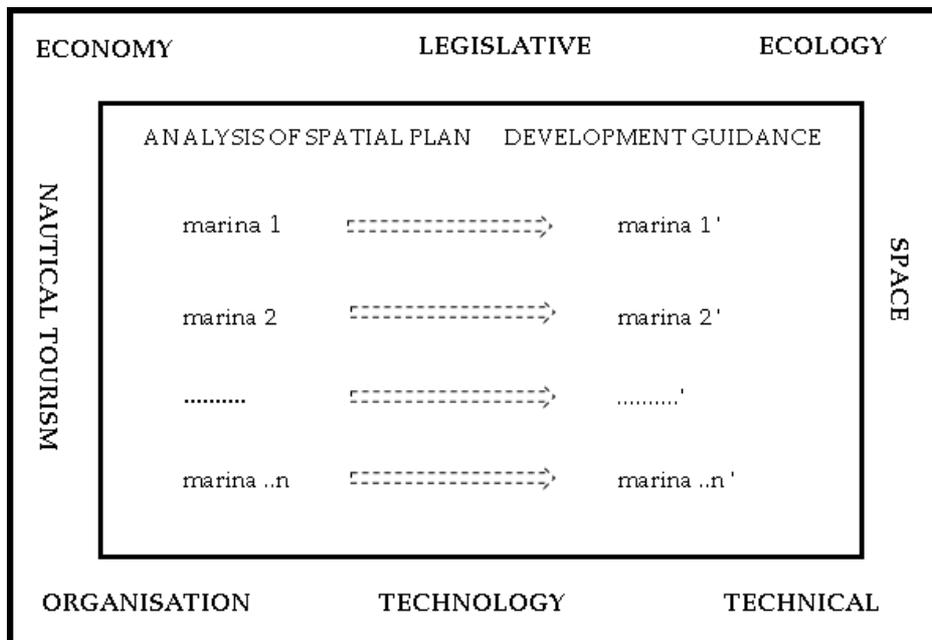
By 2019. in Dubrovnik Neretva - County there were built 5 marinas, 1 dry marina, 5 anchorage marinas and 2 moorings with 1173 berths total. Ordinance on categorization of nautical tourism ports divides ports on marinas and other facilities for the provision of services and accommodation of vessels.

2. The analysis performed within MIMOSA (methodological approach & sources)

Coastal and maritime tourism is significant part of tourist system and blue economy. One of the subsystems of coastal and maritime tourism is nautical tourism with a component of nautical tourism ports.

Law specify nautical tourism as “sailing and stay of tourists on vessels (yachts) for personal needs or economic activity such, as well as tourist stay in nautical tourism ports and public ports yachts terminal, owing to relaxation, recreation and sailing”. According to this definition, yachts use only ports exclusively intended for yachts as well as dedicated yacht’s berths at public ports. The main role of nautical tourism ports is providing berths and related services through their supply chain, but they also act as an important economy catalyst, influencing vertical activities such as shipbuilding, distribution and sales, and have market role to connect local suppliers with boaters regarding their needs such as repairs and maintenance. The methodology of the study is shown in the picture below.

Picture 3: Metodology of nautical tourism ports analisys



Source: Author

Nautical tourism ports in Dubrovnik-Neretva County are first analyzed in context of all business variables as whole region, and then each planned location individually within the same context. The

main sources of the study were various legal regulations related to the subject matter, data Croatian Bureau of Statistics, “Tomas nautika - Characteristics of nautical tourism” various years, Adriatic Yachting club data and Annual financial reports as well as other scientific and working documents and Internet pages.

3. Main outcomes of the analysis

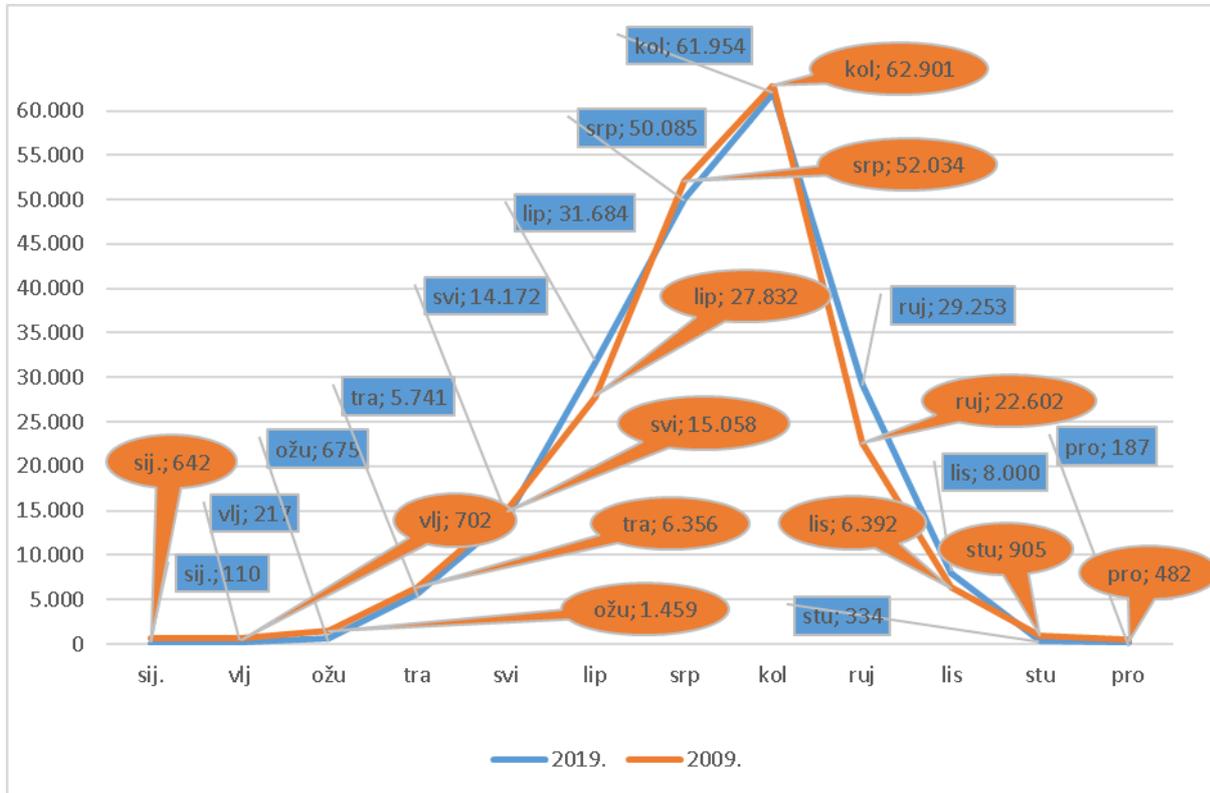
One of characteristic of nautical tourism in Croatia is significant share of nautical tourists already visited Croatia several times (70%), while more than half of them arrived based on previous experience or friends recommendations, almost twice as many as come with the application of modern internet marketing (38%).

The most significant emitting markets are Germany and Austria with a total share of 30% and an average stay of boaters twice as long as the average stay of other tourists. 2/3 of nautical tourists use charter boats for sailing and the sailing season correspond to the period from April to October with a peak in July and August.

Number of nautical ports in Croatia increased 8% in last 10 years but with significant increase in number of anchorages, not exploiting all economy potential of nautical tourism. The lack of realization of the goals of Nautical Tourism Strategy 2009. – 2019. (15.000 berths) can be attributed to a number of factors ranging from overestimating growing rate, non-stimulating tax system, demanding environmental protection legislative with long term to obtain environmental certificate or long lasting legal procedure for the realization of the nautical tourism ports.

One of the significant characteristics of nautical tourism is its seasonality, measured by the number of vessels in transit in the ten-year period 2009. – 2019. That characteristic has not changed significantly.

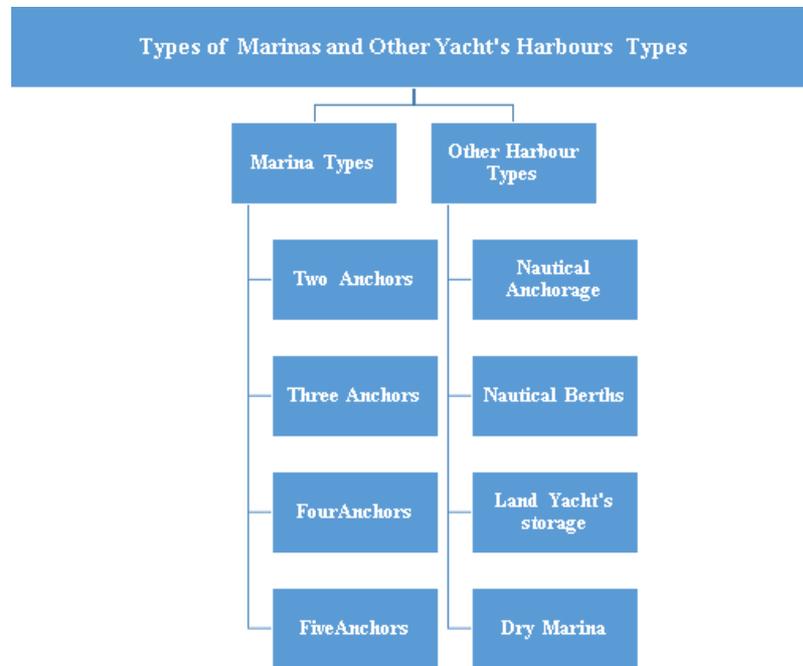
Graph 1: Number of vessels in transit in LNT comparison 2009 – 2019



Source: author according to Croatian Bureau of Statistics data 2009 - 2019

According to the Ordinance on the categorization of nautical tourism ports and the classification of other facilities for the provision of berth services and accommodation of vessels Official Gazette no. 120/2019. (Ministry of Tourism, 2019) minimum conditions are prescribed for all NT ports and marinas are classified in four categories marked with 2 - 5 anchors.

Picture 4: Types of Marinas and Other Yacht's Harbours Types



Source: Author according to the Ministry of Tourism

- Nautical tourism port and other facilities for providing berth services and accommodation of yachts (hereinafter: port and other facilities) are business functional units in which a legal or natural entity operates and provides tourist services in nautical tourism and other services for tourists (commercial , catering, etc.).
- The marina is part of a specially built and arranged sea or water area and the coast for the provision of mooring services, accommodation of tourists on vessels and other services for the needs of tourists. Drinks, beverages and meals are provided in the Marina.
- A nautical anchorage is a part of a sea or water area suitable for anchoring vessels equipped with devices for safe anchoring.
- Nautical mooring is a part of a specially built and arranged sea or water area and coast, for the provision of mooring services.
- The land yachts storage is a part of the fenced and arranged land area for the provision of services for the storage of vessels and the provision of transport, launching and lifting from the water services of the vessel. Tourist stay and the preparation of the vessel for sailing is not allowed in the land yacht's storage.

- The dry marina is a part of a fenced and arranged land area for the provision of services for the storage of yachts and transport, launching and lifting services of the yachts. Tourists can stay in the dry marina type and the vessel can be prepared for sailing. Drinks, beverages and meals can be provided at dry marina.

Ecological level of construction of nautical tourism ports is extremely important for the preservation and possible improvement of the location in visual and ecological sense. If the ecological level is neglected, nautical tourism port can be a source of numerous pollution caused by regular activities in the port or due to accidental situations, as well as weather impacts on biodiversity sites. Croatian strategic documents for environmental protection and spatial planning recommend the construction of a new nautical tourism port on locations with already disturbed natural values and reduction of the number of locations and port capacities in counties spatial plans.

According Croatian Bureau of Statistics data more than 75% revenues in nautical tourism ports are generated by revenue from long-term lease and transit berths, while the rest is generated from various services and other revenues. Over a 10-year period, revenues related with berths had a potential of growing up. The analysis of Financial data from Annual reports of Adriatic Croatia Club all marinas on islands shown below average revenues per berth except for those located in the immediate vicinity of well-known „tourist brands“ like Hvar or Korčula. ACI marinas in Dubrovnik Neretva County have negative growth trends for vessels in transit, while the number of long-term berths lease has increased after construction of marina in Slano, but not in proportion to the total capacity increase.

Additionally to nautical tourism ports in Dubrovnik Neretva County, ports open to public traffic along the quays and piers and at anchorage can accommodate at least another 900 yachts, which increases quality and diversity of the berth supply. The possibility of larger number of anchors and berth in public ports negatively influence economic results of marinas financed by private capital based or concessions, as well as motivations for new investments in marinas.

There are numerous stakeholders of nautical tourism in Dubrovnik Neretva County. By establishing a nautical tourism cluster with stakeholders from universities, public services and private entrepreneurs with the integration of modern ICT technology, knowledge about nautical tourism and its exchange can be expanded while contributing to the quality of services.

Modern ICT technology allows most of the classic port functions such as berth reservation, vessels monitoring or online service payment. Therefore, the inclusion of ICT system in technology of production of nautical tourism ports services is necessary to improve quality and streamline operations.

The analysis of individual planned nautical tourism ports includes their spatial, spatial-planning, meteorological, oceanographic, cadastral and legal factors of the property status of coastal

cadastral parcels. Numerous local self-government units of cities and municipalities in County have resulted in numerous planned nautical tourism ports. The most numerous planned ports are in 6 in Cities Dubrovnik and 4 in Municipality Orebić. A few ports are planned as anchorage.

For further development of projects of most nautical tourism ports, it is necessary to develop lower-level spatial plans with the definition of the port area. The inconsistency of ownership and title deeds in some planned ports with lengthy legal and registry procedures and lengthy preparation of lower-level spatial plans due to overlapping interests within the area or other reasons has a demotivating effect on investors for the development of nautical tourism ports.

Location of all nautical tourism ports, except smaller number of exceptions mainly planned within the hotel complexes, are planned within guidelines of the Spatial Development Strategy. Main obstacles are related to outstanding communal sewage infrastructure, especially on islands. Therefore, the most important thing is to resolve land sewage infrastructure utility as base of installations of sewage system collection plant from yachts. It is also necessary to solve the collection and disposal of waste on the islands in accordance with EU legislation and MARPOL 73/78 Convention.

Apart from ports that are being built as part of hotels resorts, all other ports except nautical port Ploče, are planned with minimal or no land area, limiting them towards the nautical berth or in rare cases towards the lower categorized marina. On this way ports are exclusively focused to transit nautical ports limiting concessionaire revenues exclusively on berths and basic port services (garbage and wastewater collection and supply of water and electricity), without other revenues generated by “full profile” nautical tourism ports. Those facts are demotivating to attract investments especially on the islands where interest for long-term berth lease is limited.

In accordance with the Dubrovnik - Neretva County spatial plans, the most number of nautical ports are defined with a capacity of up to 100 berths, 20 of them, of which 11 ports are planned on the islands. There are five ports up to 200 berths planned on the islands, while in the group of nautical tourism ports up to 400 berths, only one is planned on the island. The nautical ports built up to now are independent ports without link to hotel resorts. Only one nautical port have been built in front of an existing hotel within the same ownership (Vela Luka).

Except in Vela Luka, no new port of nautical tourism has been built on the islands in last 30 years, indicating the lack of interest of investors for their construction on the islands. The reasons for this should be sought in the traffic isolation of the islands causing low attraction for long-term berth lease and the duration of the intensive nautical season of yachts in transit limited to the period May - September.

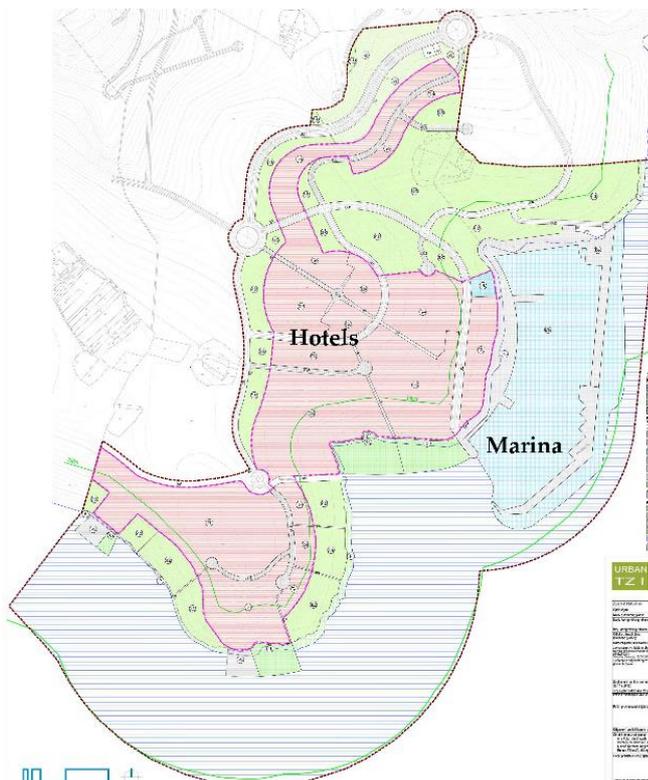
Part of the planned nautical tourism ports (up to 2,200 berths) is paired with the construction of hotel resorts jointly creating a synergy and it is the only way to cost-effective construction of

nautical tourism ports in that particular locations. The construction of a hotel and nautical tourism complex are classified into:

- a) Dominant hotel complex, and nautical tourism port is a supplement with added value for the hotel or
- b) Dominant nautical tourism ports and the hotel facility is in function of nautical tourism ports with added value for ports.

The first group indisputably includes the “Sestrice” project in the Municipality of Dubrovačko primorje, where nautical tourism ports create benefit to the quality of the hotel resort. In this and similar cases, when nautical tourism ports is planned in isolated locations, the construction of nautical tourism ports without the construction of a hotel resorts is not realistically expected.

Picture 5: Project Sestrice



Another case is the construction of hotels to complement the content of nautical tourism ports, due to lack no or insufficient capacity in existing hotels in the vicinity. Such an example is the planned

nautical tourism port Ploče. In this case, the construction of the hotel enables more profitable business to the nautical port and better service to the yachtsmen. It is not uncommon in the World that hotel and nautical tourism ports complement each another and in that case hotels are mostly B&B (4*) services with open facilities such as restaurants and bars, becoming cult gathering places for sea lovers. Usually in such cases, hotel chain and marina chain enter into strategic alliances, adding each of them contribution to the overall result.

Picture 6: Existing and planned condition of the marina Ploče

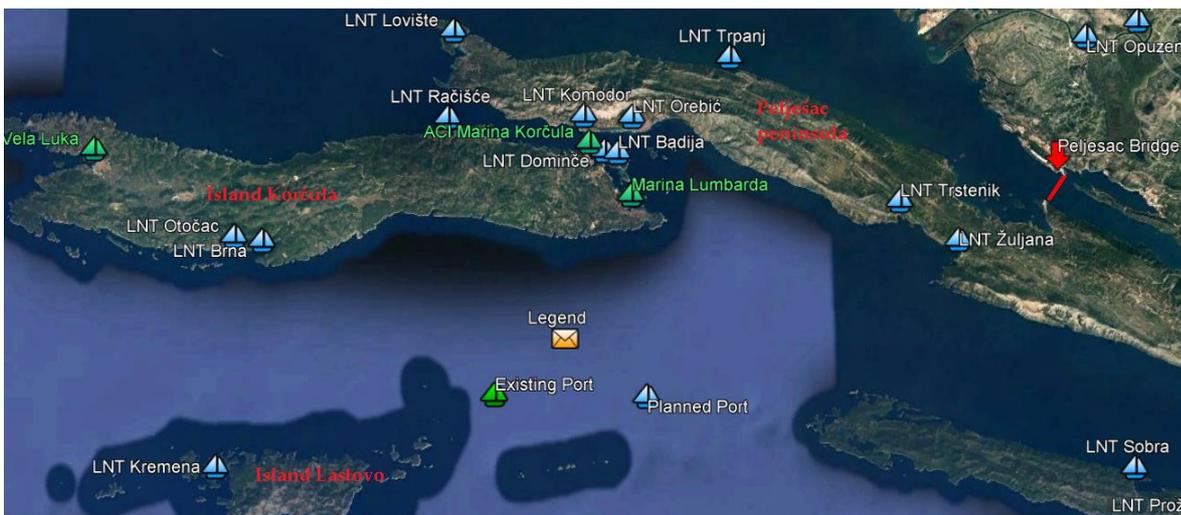




Source: <https://ispu.mqipu.hr/> and <http://www.rogotin.hr/2018/04/26/kako-bi-trebala-izgledati-marina-u-plocama/> 18.03.2021.

Completion of the construction of the Pelješac Bridge and ferry ports Perna and Korčula - Polačište will significantly contribute to improving road connections to the western part of the Pelješac peninsula and island of Korčula and Lastovo with possibility to increase interest for long-term berth lease in existing marinas on Korčula and planned marina Dominče and Orebić.

Picture 7: Pelješac Bridge under construction (red arrow) and existing and planned marinas on Pelješac peninsula and Korčula and Lastovo islands



Source: author on Google Earth pro

Some nautical tourism ports, such as the port at the locations of Luka - Kručica or Trstenik, compared with other planned or already built nautical tourism ports in the close vicinity, do not have realistic opportunities for implementation; therefore, they should be deleted from the spatial plans.

The Dubrovnik Neretva County spatial plan foresaw additional capacity building in public ports. Spatial plan of some municipalities and cities do not specify the planned capacity for nautical berth in public ports, except in the Municipality of Lastovo where 370 berths are planned in ports and on anchorages on the Lastovo Archipelago. The same is the case on the island of Mljet, where ten moorings location and five anchorages are planned without planned berth quantity. This form of competition at public ports built with public money, adversely affects the investment entrepreneurial climate, especially on islands where revenue is based mainly on transit seasonal nautical tourism.

Positive impact of the construction of nautical berths in public ports is the management of the use of the coast and anchorages in an environmentally acceptable manner and provision of services in ports for environmental protection. Therefore, this part of ports development should be focused on the arrangement of the quayside and anchorages at planned locations by installing anchor systems with buoys at anchorages and by granting concessions to the local population under strict supervision with use of modern ICT technologies. In parallel with the installation of anchorages, it is necessary to prohibit anchoring outside managed quayside and anchorage area.

Multimodal transport of nautical tourists can be divided into a part of the trip from and to the emitting region, with the predominant use of cars and airplanes, the biggest traffic polluters. The second part of multimodal transport takes place in the ports of nautical tourism where yachtsmen berth and use car rental, bicycles or wind or kite surfing for sightseeing or active holidays.

The construction of a modern railway through Bosnia and Herzegovina with modern passenger transport from important emitting regions (Czech Republic, Slovakia, Hungary, Austria ...) would contribute to faster and more comfortable travel to and from destination, and on environmental friendly mode of transport.

Analyzing individual locations of nautical tourism ports with the possibility of implementing environmentally friendly modes of multimodal transport in order to complete the tourist experience primarily cycling, on many island and mainland locations of ports is apparent. In the first place, this opportunity is provided at all mainland ports of the nautical tourism, where yachtsmen can cycle around the natural and cultural values of the landscape and get acquainted with ways of life of rural areas. On some islands, such as Mljet, recreational cycling has been developed with the possibility of renting a bicycle, while on others, such as Korčula and Lastovo, there is a lot of room for improvement. Implementing cycling into the nautical ports, their land parameters will be cognitively expanded adding new value to port.

The general conclusion regarding the further development of the port of nautical tourism in Dubrovnik Neretva County can be summarized under the definition of "LIMITED, SUSTAINABLE AND ECOLOGICALLY ACCEPTABLE GROWTH".

Picture 8: Existing and planned marinas in Dubrovnik Neretva County

