

Regional report on small ports phenomenon in the Split-Dalmatia County

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1. Introduction

FRAMESPORT will build on existing knowledge and capitalize on the outcomes of pilot initiatives by incorporating them into a new strategic framework aimed at improving the performance of small-scale maritime nodes along the Adriatic coasts. The FRAMESPORT project aims to create a coordinated initiative to support the long-term development of small ports in the Adriatic basin from a strategic standpoint. As a result, the goal is to transform small ports into proactive drivers of the socio-economic development of this coastal area.

This strategic goal necessitates a multifaceted and interdisciplinary approach that includes the implementation of concrete pilot projects as well as the identification of priority themes to be promoted as part of the overall strategy. These actions will be implemented from the ground up, with local and national stakeholders involved from the start of the project. Furthermore, the project partners have been chosen to ensure broad geographic coverage. Their mission is to address issues such as planning and management, business model implementation, training and competency enhancement, and the development of Information and Communication Technologies (ICT) tools and services. The project also intends to develop an ICT platform that collects and organizes key data on small ports, intending to use this information to drive sustainable development. The portal will connect the Italian and Croatian sides of the Adriatic basin. This allows for the creation of a more consistent and cohesive network of small ports, businesses, and institutions, as well as the promotion of their long-term performance, infrastructure, and policies to promote their development and growth.

This document begins with an explanation of the significance of this report, followed by a brief description of the Split-Dalmatia region based on a questionnaire compiled by partner IUAV, as well as information on port conditions and what they offer to tourists gathered from interviews with port authorities.

The following chapters were based on listing all of the port areas under the management of county port authorities, as well as the current state of the art, which was illustrated through tables and figures, showing how Split-Dalmatia county ports compare to other regions on a percentage basis. The main takeaway was to provide the reader with statistical data presenting the levels of adoption of specific trends, port infrastructure and superstructure, and an overall offer port has.

Following that, a SWOT analysis was performed to simplify the external and internal elements that ports in the Split-Dalmatia county region must deal with. Despite its status as a rising competitor in

the Mediterranean, the Split-Dalmatia region faces a plethora of opportunities to further develop this sector of business and tourism. Nonetheless, there are some threats, so all of the elements must be considered during the decision-making process.

1.1. Purpose of the document

This region-based document aims to depict an overall picture of the current state of the ports and harbours within Split-Dalmatia county territory by presenting relevant information on existing facilities and single port characteristics and services based on data collected through the WP5 questionnaire. Each document is regionally based, so each region receives adequate attention when describing its initial status.

The content of this regional report has been extracted and fragmented so that the partner can provide a document containing a complete set of data on ports and harbours managed by county port authorities within a region.

Information gathered in previous steps, will then be used to complete the detailed picture of the Adriatic Sea's two coastlines, as well as serve as a first source of information for eventually filling the FRAMESPORT platform.

It is also worth mentioning that the statistics in this report do not include privately owned marinas (e.g. ACI Marinas), only ports of regional and local significance under the scope of port authorities.

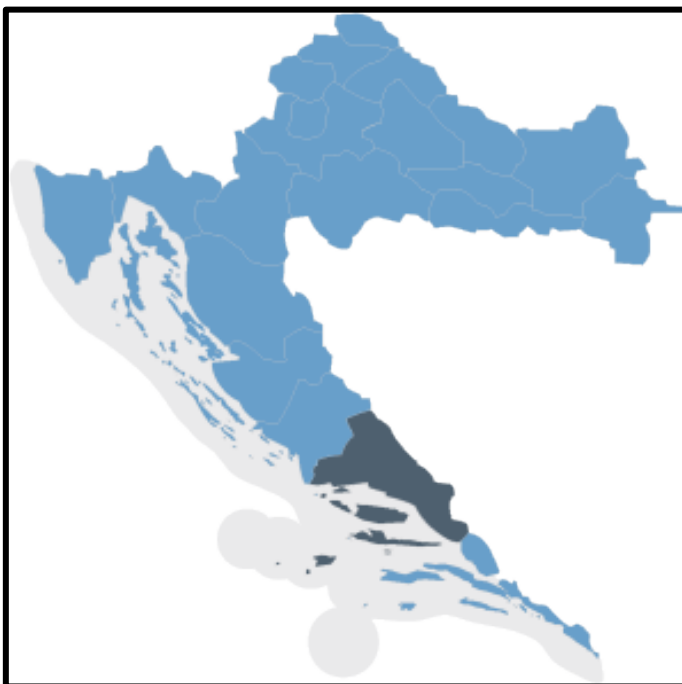
2. The region in a nutshell

2.1. Geographical context and socio-economic description of the region/county

Split-Dalmatia County is Croatia's largest county located in the central part of the country's south and, as such, has an appealing geographical position, climate, historical significance, and a significant impact on the overall development of both neighbouring areas and the entire gravitational area. Split-Dalmatia county stretches from Vrlika in the north to Palagruža in the south, and from Marina in the west to Vrgorac in the east.

The combined surface of the mainland and the island is 4.523,64 km² (8% of the Republic of Croatia's surface), and the sea surface is 9.576,40 km² (30.8% of the sea surface of the Republic of Croatia). The coast takes up the majority of the land area (59,88%), while islands take up the smallest portion of the land area (19%).

Figure 1: Split-Dalmatia County location in Croatia





Split-Dalmatia County shares borders with the Republic of Bosnia and Herzegovina in the north, the Dubrovnik-Neretva County in the east, and the Republic of Croatia's territorial sea in the south.

The county is divided into three geographical subunits:

- hinterland
- coastal area
- islands

Mountains that run parallel to the coast cut through the hinterland in the county's continental part. The region is sparsely populated and economically deprived.

Table 1: Split-Dalmatia County statistical data as per census 2011

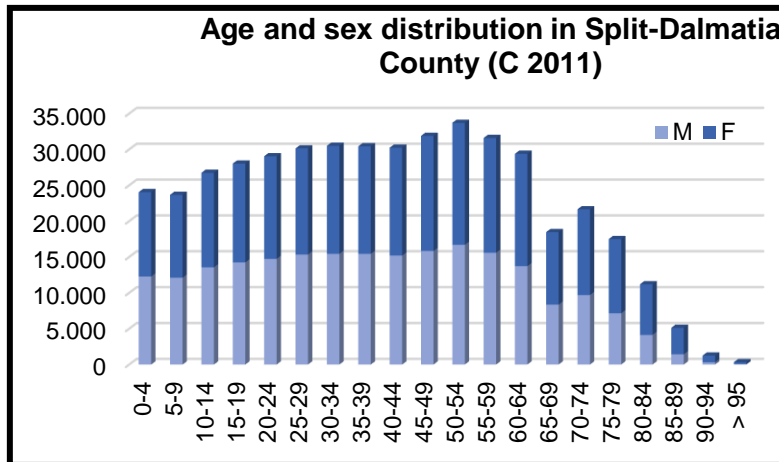
Split – Dalmatia County as per census 2011	
Symbols (flag and coat of arms)	 
Area	14.106,40 km ²
County seat	Split
Settlements	16 towns and 39 municipalities
Population	455.242
Population density (per km²)	100,2

Between mountain ranges and the sea, the coast forms a narrow belt. In comparison to the hinterland, this area is highly urbanized and economically developed. Between mountain ranges and the sea, the coast forms a narrow belt. In comparison to the hinterland, this area is highly urbanized and economically developed. The islands are sparsely populated and more developed economically than the coast, but due to a variety of factors, they have a permanent emigration of inhabitants.

The County's island area consists of 74 islands and 57 cliffs and reefs. In terms of size and population, five islands stand out: Čiovo, Šolta, Brač, Hvar, and Vis. Veli Drvenik, Mali Drvenik, Sv. Klement, Šćedro, Biševo, and Sv. Andrew are six more islands that are inhabited.

According to the 2001 census, 463,676 people lived in the area of Split-Dalmatia County of 4,523 km² (approximately 8% of the area of Croatia), representing 10.68% of the Croatian population, of which approximately 18% are employed. According to the 2001 census, the working population totalled 296,386 people (63.9%) of the total population, which is comparable to the Croatian average. Education indicators, i.e. the level of education, show that production opportunities have increased significantly in terms of the quality of human labour.

Figure 2: Gender / age diagram for Split-Dalmatia County as per c2011



The gender and age split largely mirrors the Croatian trend, in which the population is ageing rapidly, implying that a large number of young and work-capable people are leaving the country in general and moving to western European countries, and inflow rates are virtually non-existent. After the Croatian War of Independence, the rapidly ageing of the population took a downward turn. A variety of social and psychological factors are said to be influencing the current situation. Migration within the County had a greater impact on population distribution than immigration into the County, with 22.5% of the population moving to their current location from another city or municipality within the County. They primarily relocated to Split or coastal areas, whereas on the islands, particularly in Zagora, the proportion of the population residing in the municipality of birth is significantly higher.

The characteristics of economic development and the attractiveness of Split and the coast have conditioned the extremely unequal distribution of the population, with coastal cities and municipalities housing 69% of the County's inhabitants (including Split). The mechanical movement has been the primary source of population growth in the county in the past. The natural increase trend paints a complete picture of the favourable demographic situation, but it is the result of previous immigration processes. In the long run, the county has significantly higher natural growth rates than the Croatian average, and it is the only county that has never recorded a negative rate. It should be noted, however, that Croatia has completed the demographic transition process and has entered the phase of negative natural population growth.

In 2011, the average age of the County's population was 40,8 years, while the Croatian average was 41,7 years 2011 (men 39,9, women 43,4), making it one of Europe's oldest nations. The average age

has risen by nearly ten years in the last 50 years (from 32,5 in 1961 to 41,7 in 2011), owing to a long-term decline in fertility rates.

Different migration characteristics in the 1990s conditioned that Zagora, despite exhaustion and a very small population, has a more biologically vital structure and higher rates of natural increase, whereas the islands exhibit the structure of an extremely old population.

Employed people make up 19% of the county's population. Approximately 74% of employees work in the economy, with the remaining 26% working in other industries. The County's share of the total number of employees in Croatia is 8,5%. The indented coastline, rich watercourses and lake reservoirs, and karst fields provide a natural foundation for the development of maritime, shipbuilding, fishing, trade, Mediterranean climate-specific agricultural production, and especially tourism.

Total revenue structure by activity

- Trade 40,1%
- Manufacturing 24,1%
- Construction 18,2%
- Business Services 6,1%
- Other activities 11,5%

For many years, trade has been the most represented activity in the Split-Dalmatia County in terms of the number of companies (21,1% in 2016) and total revenues (36,2 % in 2016), and businesses in this activity employ the most people (23,5 % in 2016) Significant changes have occurred in the retail network in recent years, with capacity increasing and structure changing. The main trend in consumer goods retail trade is an increase in the market share of discount stores, supermarkets, and hypermarkets and a decrease in the market share of traditional retail.

Manufacturing in Split-Dalmatia County contributes significantly to Croatia's overall financial and economic performance. The following are the most important representatives of the Split-Dalmatia County's manufacturing industry in terms of activities:

- Shipbuilding: Shipyards can construct all types of ships, including tankers, product carriers, bulk carriers, container ships, refrigerated cargo ships, passenger ships, docks, and other ships and crafts. However, shipbuilding in Croatia is done on an individual basis rather than in a series. It focuses on more demanding, higher-quality, complex, and sophisticated new construction projects.

In the design of each new ship, world-class knowledge and achievements are used in addition to domestic knowledge.

- Mechanical engineering/metal processing industry: The most powerful and high-quality mechanical engineering capabilities are aimed at shipbuilding and nautical programs, design, construction, manufacture, installation, and testing of electrical appliances, electronic equipment, solar cells, and devices.
- Chemical industry - manufactures plastic parts for the automotive industry, plastic packaging for the food, cosmetics, and pharmaceutical industries, various types of plastic pipes, telecommunications system equipment, panels, tanks, boats, covers, and skylights, and interiors for railway vehicles using polyester processing technology as the primary raw material.
- Building material industry - The production of cement and architectural building stone is particularly important in the building material industry.

Stone is the most important mineral raw material in Split-Dalmatia County. As a result, stone quarrying and processing (architectural-building and technical stone) is a significant economic activity in the County with a long history. It is a stone that is recognized and valued beyond the borders of Croatia, and it has been used to construct many famous buildings around the world as well as many monuments of local cultural heritage. The Stonemason School in Pučišća, Brač (www.klesarskaskola.hr), the only such school in Croatia and one of the few in Europe with a high reputation among domestic and foreign experts, plays an important role in preserving this tradition. The stonemason school in Pučišća has become a tourist attraction.

The sea coast and beaches, historical and cultural heritage and various festivals and events serve as the foundation for the city of Split's tourism development. In recent years, the city has transitioned from a transportation hub to a popular tourist destination. The increase in tourist arrivals is being accompanied by an increase in the number of overnight stays. Split, as a tourist destination, is on many lists of the world's most appealing destinations. The city of Split was named the most successful Croatian tourism destination and city break destination in 2017 by the Ministry of Tourism, the Croatian National Tourist Board, and the Croatian Chamber of Commerce.

Tourism is one of the most important economic activities in Split County, owing to its popularity primarily to the high quality and diversity of the tourist resource base, but also the area's long tourist tradition. As a result, tourism has great potential for stimulating economic growth and development in the county as well as raising the standard of living of the local population, both through the

implementation of certain infrastructure projects that are equally useful to tourists and locals (airports, nautical tourism ports, roads, traffic at rest, arranged public areas, and so on), as well as through the implementation of certain infrastructure projects that are equally useful to tourists and locals (airports, nautical tourism ports, roads, traffic at rest, arranged public areas, etc.

The Gross domestic product of Split-Dalmatia county for 2018 is € 4.278.336,00 or 6% of Croatia's total gross domestic product. The GDP per capita is €9.636.

2.2. Regional transport and mobility overview and main features

The transportation sector is an important component of the economy and a common tool for development due to its extensive use of infrastructure. This is especially true in today's global economy, where economic opportunities are increasingly linked to the mobility of people and goods, as well as information and communication technologies.

Transport infrastructure is a critical component of economic development at all income levels. It promotes personal well-being as well as economic growth. Infrastructure indirectly contributes to economic development through a variety of channels, including the facilitation of productive private investment, the creation of new activities (supply chains), and the reshaping of economic geography.

Transport infrastructure is a required input in the production of transportation services, which are required to allow for the market exchange of final goods and inputs (including labour) – or for broader welfare benefits (e.g., travel time savings). Because of its critical economic role, transportation infrastructure is frequently referred to as the "backbone" of a modern economy.

Several infrastructure investments have been initiated or are in the planning stages. The county's largest investments are in transportation infrastructure, so it has new and modernized roads, a renovated and expanded airport and port infrastructure, and the preconditions for solving railway infrastructure have been created. Projects involving energy and communal infrastructure are also important.

Road traffic

The A1 motorway, the state road D8 Trogir-Solin-Split-Omiš, and the network of main city roads on both the mainland and the islands form the foundation of the road traffic route.

Thanks in large part to the A1 motorway, since 2005 the City of Split has been connected with the capital Zagreb, other cities on the Adriatic coast and Central European cities. In the section Split-Omiš, the permeability of the state road D8 (Adriatic Highway) is below the need.

According to the Croatian Bureau of Statistics, Split-Dalmatia County has 2,625 kilometres of roads, of which 756 km are state roads, 830 km are county roads, and 902 km are local roads. The network's road density is 578 meters per square kilometre.

The Zagreb-Split-Dubrovnik motorway is part of the road route connecting Croatia's continental part and the Dalmatian region, out of which. So far, a total of 137 kilometres of highway pass through Split-Dalmatia County. On the section through SDZ, 9 hubs have been built so far: Prgomet, Vučevica, Dugopolje, Bisko, Blato na Cetini, Šestanovac, Zagvozd, Ravča, and Vrgorac.

Maritime transport

Ports in Split-Dalmatia offer both national and international connectivity and both by ferries and high-speed passenger crafts (HSC, mainly catamarans).

Given the county's location and the number of islands that make up its territory, it is critical for the island population's daily lives to maintain communication to Split, the county capital. The islands of Brač, Hvar, Šolta, and Čiovo surround the Split peninsula. Ferries and/or high-speed passenger crafts (HSC) connect them to the mainland. Port of Split is connected with islands as well as Italy via international connections which run through the entire year and additional lines which run seasonally.

The city of Split's seaport and airport provided additional good transportation connections. Domestic traffic accounts for roughly 90% of passenger traffic at Split's City Port, with more than 5.5 million passengers and 827,000 vehicles passing through in 2019¹.

A ferry connects Split and Ancona, Italy. The ferry line Split - Supetar has the most passengers and vehicles, followed by the fast ferry lines Korčula - Prigradica - Hvar - Split. Except for the international line Split - Ancona, all ferry lines saw an increase in the number of passengers from 2006 to 2019. In contrast, all high-speed passenger craft lines experience a decrease in passenger numbers during the same time.

¹ [Split Ferry Port Records 5.6 Million Passengers in 2019 \(total-croatia-news.com\)](https://total-croatia-news.com) (visited 20/09/2021)

According to Hrvatske Ceste estimates, passenger cars account for the majority of traffic (ranging from 63.71% of the PGDP line Split - Vis to 81% PLDP on the line Split - Supetar), with a distinct seasonality. The average annual daily traffic is two to three times less than the average daily traffic during the summer.

Rail-road traffic

The number of passengers arriving in Split by train is limited, and according to the Croatian Bureau of Statistics, it fell from 160,686 in 2011 to 112,480 in 2017. During the same period, freight rail traffic was reduced (from 269,030 t to 136,817 t).

A city railway line connects Split to Kaštel Stari in Split-Dalmatia county. The second line between Split and Kopilica functioned until the end of 2019 when it was decommissioned.

Air traffic

Split International Airport (IATA: SPU) handled 3.301.930 passengers in 2020 (a 6% increase over 2018), and the number of passengers increased by 88% between 2014 and 2019. Traffic at the Split Airport is extremely seasonal, with 81% of the passenger traffic occurring between the beginning of May and the end of September which also coincides with the Croatian summer season.

Split Airport's new passenger terminal was inaugurated in the summer of 2019. From August through the end of November of 2019, the airport had more passengers than the country's busiest airport, Zagreb, for the first time in its history. July and August account for more than 40% of all annual traffic. During the four summer months, the country's main airport in Zagreb, which is located in the capital, has the largest passenger traffic.

Split Airport is not the only airport in the county; there are a few smaller airports as well, such as the Brač Airport (AITA: BWK) on the island of Brač, which had passenger traffic of 25.190 in 2017, indicating a high seasonal traffic prevalence similar to Split, where 85% of all passengers travelled through the airport between June and September.

2.3. Overall governance and transport planning references

Split-Dalmatia County is the largest Croatian county in terms of area, and it is located in the south of the country. On the mainland and the islands, the county is made up of 15 cities and 38 municipalities. Split serves as the county seat.

The County Assembly, a body of residents that adopts acts that pertain to the county's rights and responsibility as a regional self-government organisation, is presided by the County Prefect. Members of the County's assembly are called 'the councillors' and are elected every four years. The county's Prefect is the holder of the executive power as president of the assembly.

There are 55 regional and municipal ports in the county. Apart from Split, County is home to 54 other ports of regional and local significance. Split is the largest port in the county and is a port of special - international economic interest for the Republic of Croatia. The county is home to the international airports of Split and Brač (on the island of Brač), which handles the majority of passengers and freight during the summer. The island of Hvar also has a tiny airport that caters to tourist traffic and smaller planes.

The county is connected to the rest of Croatia via highway A1 – running from Zagreb to Ploče (in future Dubrovnik) and via railway running from Zagreb to Split.

3. Analysis of regional ports phenomenon

This analysis of the regional small port phenomenon is the result of research done based on a questionnaire developed by International University Venice (IUAV) and filled using the EU survey platform in WP3), and this data is critical for completing the database that will feed the portal that is being developed and for providing a picture of the state of the territory's small ports, which will be one of the portal's features.

3.1. Overall description of available infrastructures (position, visualisation, berth details and capacities, hinterland connection)

The Port Authority of Split was founded by Decree of the Government of the Republic of Croatia on the establishment of the Port Authority of Split („Official Gazette“ no. 45/97, 155/98, 72/11, 114/14) with the aim of managing, building, and utilising the Port of Split.

The Maritime Domain and Seaports Act governs the establishment, organization, and activities of the Port Authority, which is a non-profit legal entity.

According to its mission, the Port of Split is a port accessible to worldwide public traffic, and it is listed as a port of particular (international) economic interest for the Republic of Croatia due to its size and importance.

Split is Croatia's busiest passenger port and the third busiest passenger seaport in the Mediterranean. The Port of Split Authority manages the port, and Trajektna Luka Split and Luka d.d. Split, as well as 11 secondary concessionaires, have been granted concessions to utilize the port's facilities and provide services.

Locations under the Split Port Authority:

- City port basin
- Vranjic – Solin basin (the North Port)
- Kaštela Basin B
- Kaštela basin C
- Kaštela Basin D (Resnik)
- Kaštela Fishing port

3.2. Split-Dalmatia County port authority

The Split-Dalmatia County Port Authority was established on March 1, 1999, to administer, construct, and operating public-traffic ports of the county and municipal significance

The Port Authority of Split-Dalmatia is responsible for:

- the development, maintenance, management, protection, and improvement of marine assets that represent the port region.
- development and maintenance of port substructure, which is funded by the port administration's founders' budget,
- expert supervision of the port's construction, maintenance, management, and security (port substructures and superstructures),
- assuring the continuous and uninterrupted performance of port traffic, technical-technological unity, and navigational safety,
- ensuring the supply of services of general interest or for which other economic entities have no commercial interest,
- harmonization and oversight of the work of concession holders who undertake economic activity in the port area,
- decision on the establishment and management of a free zone in the port area in line with the legislation regulating free zones, and other functions as stipulated by the law.

The port authority handles a total of 54 ports and harbours in Split-Dalmatia County, making it one of the port authorities in charge of most ports of all port authorities. Split-Dalmatia County port authority has ports on both mainland and the county's archipelago's islands: Drvenik Veli and Drvenik Mali, Šolta Brač, Hvar, and Vis.

Figure 3: Ports and harbours under Split-Dalmatia County Port Authority management



Ports under Split-Dalmatia County Port Authority include:

1. Arbanija – 76 berths
2. Baška Voda – 19 berths
3. Bobovišća – 84 berths
4. Bol – 150 berths
5. Brela – Soline – 88 berths
6. Drvenik – 42 berths
7. Drvenik Mali – 89 berths
8. Drvenik Veli – 60 berths
9. Gradac – 86 berths
10. Hvar – 50 berths
11. Igrane – 32 berths
12. Jelsa – 186 berths
13. Kaštel Gomilica – 27 berths
14. Kaštel Kambelovac – 18 berths
15. Kaštel Lukšić – 78 berths
16. Kaštel Stari – 20 berths
17. Kaštel Sućurac – 33 berths
18. Komiža – 32 berths
19. Krilo Jesenice – 83 berths
20. Makarska – 62 berths

21. Marina – 112 berths
22. Maslinica – 59 berths
23. Milna – 187 berths
24. Mimice – 24 berths
25. Mirca – 15 berths
26. Nečujam – 30 berths
27. Omiš – 169 berths
28. Pisak – 24 berths
29. Podgora – 3 berths
30. Postira – 105 berths
31. Povelja – 76 berths
32. Pučišća – 134 berths
33. Rogač – 40 berths
34. Seget Donji – 22 berths
35. Slatine – 100 berths
36. Split Spinut – 890 berths
37. Split Zenta – 898 berths
38. Splitska – 36 berths
39. Stari Grad Hvar – 462 berths
40. Stobreč – 4 berths
41. Stomorska – 142 berths
42. Sućuraj – 86 berths
43. Sumartin – 98 berths
44. Supetar – 237 berths
45. Sutivan – 92 berths
46. Trogir – 194 berths
47. Trogir – Banj – 250 berths
48. Vinišće – 4 berths
49. Vira – 6 berths
50. Vis – 160 berths
51. Vranjic – 128 berths
52. Vrboska – 95 berths
53. Zaostrog – 37 berths
54. Živogošće – 52 berths

As seen in the chart below, the ports under the port authority's administration vary in size, so we can easily categorize them into three groups: small, medium, and large.

Table 2: Split-Dalmatia Port County Authority - general information

Port / Harbour	Max. Vessel length (m)	Minimal seabed depth (m)	Port entrance width (m)	Total port area (incl. Service activities) (m)
Arbanija	1	0,5	10	1.512
Baška voda	2,5	1	48	6.570
Bobovišća	2	1	100	8.715
Bol	5	1,5	200	110.722
Brela - Soline	2,5	1	25	11.309
Drvenik	2	1	50	61.237
Drvenik Mali	1	1	50	15.184
Drvenik Veli	2	0,5	50	27.899
Gradac	2,5	1	50	20.777
Hvar	6	1,5	200	281.688
Igrane	1,5	0,5	50	5.068
Jelsa	5,5	1,5	200	53.990
Kaštel Gomilica	2,5	1	50	5.919
Kaštel Kambelovac	2,5	1	50	102.851
Kaštel Lukšić	2,5	1	50	75.552
Kaštel Stari	2,5	1	50	61.834
Kaštel Sućurac	2,5	1	50	145.679
Komiža	5,5	2	200	63.150
Kriko Jesenice	5,5	2	100	111.790
Makarska	6	2	200	102.018
Marina	2,5	1	100	18.764
Maslinica	3	1	50	26.697
Milna	4	1,5	200	46.985
Mimice	1,5	0,5	50	11.085
Mirca	1,5	0,5	50	11.190
Nečujam	2	0,5	100	29.770
Omiš	3,5	1,5	200	60.240
Pisak	1,5	0,5	50	9.512
Podgora	3,5	1,5	200	69.377
Postira	2,5	1,5	100	69.565
Povlja	2	1	150	58.690
Pučišća	3,5	1,5	200	46.534
Rogač	3,5	1,5	200	40.865
Seget Donji	1,5	1	200	38.728
Slatine	3	3	50	22.142
Split - Spinut	3,5	1	50	

Split - Zenta	3,5	1	100	
Splitska	2,5	1	75	8.504
Stari Grad Hvar	6	1	150	189.202
Stobreč	3,5	1,5	50	31.562
Stomorska	3,5	1	100	33.060
Sućuraj	5,5	2	200	56.030
Sumartin	5,5	1,5	100	32.250
Supetar	5,5	1,5	200	86.315
Sutivan	3,5	1	50	16.270
Trogir	5,5	1	400	164.885
Trogir - Banj	3	1	50	
Vinišće	3,5	1,5	100	226.874
Vira	3,5	1,5	50	22.428
Vis	6,5	1,5	200	8.815
Vranjic	2,5	1	50	14.259
Vrboska	3,5	1	100	39.190
Zaostrog	3	1	50	14.060
Živogošće	2	0,5	50	13.824

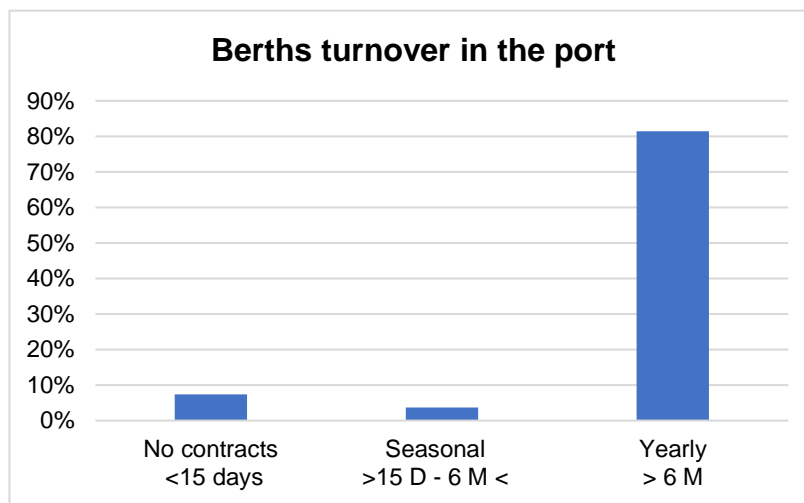
Ports size is related to their location (island or mainland), proximity to larger cities or smaller towns, as well as the size of the population that gravitates to it, which is related to the development of the area around the port, services offered both to locals and tourists who stop there to spend the night or take advantage of services such as restaurants and boat services.

The infrastructure varies widely from port to port. Some berthing constructions are solid (permanent), while others appear to be temporary to accommodate growth and accommodate all interested tourists (yachters/boaters). The majority of ports have a breakwater that protects the port and the boats that are berthed from possible inclement weather. Depending on location and prevailing winds, as well as potential inclement weather throughout specific seasons. One thing to keep in mind is that the Port Authority is constantly monitoring and working to construct better ports for all interested parties.

The port typology covered in this inquiry is reflected in berth turnover. According to Croatian law, port authorities do not handle special purpose ports – marinas because they are under the concession (as are other business facilities on the maritime demesne), hence they are not part of this study.

More than 80% of berths are occupied all year round and covered by the annual contract - these are typically communal berths where smaller boats are moored all year. Except for Makarska, Podgora, and Stobreč, less than 10% of ports and harbours have a higher share of berths booked for 15 days or less. These are primarily island ports: Bol, Hvar, Komiža, Jelsa, and Vis, where there is prevailing a tendency of high seasonality, as in the rest of the coastal city towns, where at various times in summer, towns have several times the number of people due to the tourist season.

Figure 4: Berth turnover in the Split-Dalmatia county ports



All ports managed by this port authority can handle vessels with sails and self-propelled vessels, albeit some ports care smaller and some are larger due to berth size constraints in the port.

3.3. Overall description of available services for users (technical services, nautical services, waste collection, touristic services)

Marine services are port-related activities that are carried out to ensure the safe and efficient flow of vessel traffic in port approaches and harbours, as well as a safe stay at berth when moored or at anchor. Safe port conditions ensure that vessels using the port, the port environment, and the marine environment are safe.

Port location has a significant impact on the availability of port services; ports located closer to cities or with bigger gravitational populations generally provide more services to their customers, whereas ports located on an island and not close to larger towns may only provide basic services. The situation with port services is also affected by seasonality, where we see trends where certain

services are available during seasons to better cater to guests. During research and data collection, the author notices that different groups of services have different providers, i.e. some are centralized and provided by the port authority, while others may be provided under concession.

Data was collected based on questions posed by a partner IUAV, and findings will be presented in the upcoming chapter for 54 ports under the Split-Dalmatia county port authority.

3.3.1. Nautical technical services

The Port services are the provision activities required to ensure the Port's operation, to enable maritime traffic operations to be carried out in conditions of safety, efficiency, regularity, continuity, and non-discrimination.

Mooring and unmooring services function are to pick up a vessel's mooring lines, take them, and attach them to the elements arranged on the docks or moorings for this purpose, in the mooring sector designated by the Port Authority, and in the order and layout convenient for docking, unmooring, and undocking operations.

The function of unmooring a vessel's mooring lines from the fixing elements to which it is moored, under the sequence and instructions provided by the captain and without affecting the conditions of the vessels moored next to it. Mooring services are provided by port authority employees and are available at all ports in Split – Dalmatia County (100% coverage). In the ports managed by the Split-Dalmatia County Port Authority, two people are employed on average throughout the year, with at least another two employed during the tourist season; however, the number of people performing mooring in ports varies between one and ten.

All (100%) of the county's ports offer round-the-clock (0-24h) mooring service 365 days a year, and all (100%) of the county's ports offer emergency mooring.

Presence of the basic services in the port:

Table 3: Statistical representation of basic services in the ports

Lifting and lowering the vessel into the sea - 16,7%	Vessel storage space 5,6%
Hull washing - 5,6%	Trailer for moving the vessel - 11,1%

Temporary storage space - 7,4%	Cranes (self-propelled, land) - 7,4%
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Table 3 demonstrates that services offered in county ports such as lifting and lowering into the sea, place vessel storage and/or crane, and so on are scarce in the county's ports, owing primarily to the fact that such services necessitate certain space to install such infrastructure and superstructure and to perform services of the sort, and it also demonstrates that the vast majority of the county's ports lack hence the very low percentage of ports offer this kind of services.

For a specific service to provide engine maintenance and repair services, marine engine manufacturers require extensive training programs that lead to the certification which must be verified and constantly upgrade its knowledge to provide a high level of service. Because the port must ensure a large enough area for vessel manipulations with all the necessary infrastructures and superstructure elements, the availability of boat repairing service/overhaul shipyard falls under the segment of the high-end port level of equipment.

Table 4: Statistical representation of bot services/maintenance offer in Split-Dalmatia county ports

Sales of technical products for vessels in shops and/or warehouses – 2%	Electrical services – 0%
Hull repair – 0%	Supervisor – 0%
Manufacture and repair of sails and awnings – 2%	Dry dock/Slipway – 13.2%
Sales of technical products for vessels (custom) – 2%	Electronic services – 3.7%
Upholstery services – 0%	Warehouse – 0%
Rope fitting and adjustment services – 2%	Plasticization of vessels / glass plastic – 0%
Marine engine service – 43%	Ship joinery – 2%

Based on the data in Table 4, it is straightforward to conclude that the overall size and relatively small area on which the ports are built are fairly constricting factors, confirms what was previously stated that ports in the county only offer very basic services mainly due to space restriction. In the case of ports under the management of Split Dalmatia county port authority, port areas are limited, resulting in certain services being provided not within the port area but in the surrounding areas or

if possible at berth. A good example of this is vessel engine services, which are provided 'on-call,' meaning that they do not have a designated area like a shop, but rather arrive in the port based on a request from the customer. That also signals the need for expansion.

It can be concluded that the overall size and relatively small area on which the ports are built are fairly constrictive in terms of the ports' developmental possibilities; thus, port expansion could be a solution, and the authors learned from discussions with port authorities that this is being considered. The aforementioned services (not all of which are available in all ports) are available in approximately 5 of the 54 ports. Percentages are discouraging, but they are not surprising given that most of these ports are improvised and were built to provide a haven for vessels while not spending too much money on anything other than basic needs.

Technical diver services include underwater maintenance and repair work on ships, yachts, and boats, as well as underwater inspections and inspections, towing, lifting ships and structures from the seabed, drilling, and cutting. Although 46% of ports provide technical diver services, it is possible that these services could be provided in more ports in the event of an emergency. Furthermore, there are no technical divers on-site; they are provided by third-party vendors.

Fire protection at the docks is not available in Split-Dalmatia county ports; instead, some ports have connections to water from fire hydrants located throughout the ports.

Only 20% of ports provide radio service to boaters, and all ports that do provide this service do so 24 hours a day, seven days a week.

3.3.2. Environmental aspect

When selecting a destination, tourists usually consider the environment. Tourists usually notice the state of the environment by comparing the current situation to that of previous destinations visited. It is, therefore, necessary to consider the state of the sea, the cleanliness and comfort of beaches, bays, harbors, and other natural attractions available to them. It is undeniable that natural resources contribute significantly to the development of small ports and serve as the foundation of its allure, but with its growing popularity, there are both positive and negative aspects to this type of tourism.

Fuel and other sorts of garbage, such as litter, sewage tank leakages, toxic antifouling paints, and grey waters from boats, are the most serious environmental impacts of small ports, according to boaters. There are now few facilities to empty septic tanks, or tanks are out of service, increasing

the possibility of boaters emptying tanks into the sea, despite laws and regulations safeguarding the environment and outlawing such actions. As a result of increased environmental consciousness and the expansion of eco-friendly initiatives, ports recognized such trends and began a quest to improve their offer and overall company. Ports should decrease the use of single-use products and may make use of recyclable materials.

One of the concepts suggests that ports could use recyclable and environmentally friendly products and even provide suggestions on how boaters could be more environmentally conscious.

The overall ecological impact could be reduced in a variety of ways:

- Establishing or improving a waste management system through the provision of infrastructure that would engage (emptying containers regularly, locating them near ports, and enabling waste sorting),
- Improving the upkeep of shore gas and pump-out stations (checking and repairing them on a regular basis, providing proper instructions on how to use them, and ensuring a sufficient number of safe and easy-to-use shore pump-out stations),
- Increasing boaters' environmental awareness
- Improving the marking of visitors' berths to make them easier to find for boaters; and
- Incentivizing boaters to use such facilities with lower fees.

Table 5 depicts the state of environmental aspects in Split-Dalmatia country ports. There are no desalination plants or wastewater monitoring systems. The lack of environmental management system certification also leads to the obvious - that there is no environmental education and activities for employees, offering something ports can work on as more and more boaters visiting ports are aware of the environmental impact of boating.

Table 5 Statistical representation of ecological aspect in ports and harbours

Presence of a port wastewater monitoring system – 0%	Presence of desalination plants – 0%
Presence of a separate waste collection system in the port – 30%	Presence of air purification system in the shipyard (within the port) – 0%
Presence of a sewage treatment plant in the port – 7%	Presence of water purification plant inside the shipyard – 0%

Presence of ecological tanks for collecting waste oils and wastewater – 100%	Level of environmental education and activities promoted for users and staff – 0%
Presence of a proper battery disposal service – 3.8%	Level of promotion of sustainable modes of transport – 15%
Existence of Environmental Management System Certification (renewable annually) – 0%	Fuel distribution centres/Pump out stations – 6%

There is a very low level of **promotion of sustainable modes of transportation** present at only **15%** of the ports, which would not exist if the European Union's greener agenda and state commitment to running greener transportation in accordance with European policies did not exist.

It is encouraging to see that all ports (**100%**) have **ecological tanks for the collection of waste oils and oily waters**; however, there is one area that can be improved, and that is the availability of waste separation systems in only 30% of ports.

3.3.3. Touristic services

The size and characteristics of the islands, their relative position, a short distance from the mainland, the coastline, and the totality of ecosystems combine to make the Split-Dalmatia county's coastal area truly unique and suitable for nautical tourism as an integral part. An extremely favourable climate, oceanographic, civilizational, historical, and environmental features, as well as many other relevant features, including land part, to these attributes. All of these factors serve as the foundation for the symbiosis of small ports and tourism in the area. Nautical tourism is a multifunctional tourist activity with a strong maritime component that is included in nautical tourism as a tourist phenomenon, with sea vessels and ports serving as their havens.

Touristic services are defined as an overall offer to port users that goes beyond basic needs. Tourist services encompass a wide range of fields in which customers seek individual satisfaction, which affects the overall perception of the ports.

Welcoming tourists in their native language conveys a sense of respect and hospitality. Dalmatia region has long been influenced by the Italian (Venetian) culture visible in the art, culture and architecture, resulting in an above-average presence of Italian-speaking locals.

Employees of Split-Dalmatia county welcome tourists to their ports in fluent **English** in all ports (**100%**) followed by **Italian** in **80%** of ports and **German** in **60%** of ports - Italy and Germany are also Croatia's prime tourist markets, with the largest numbers of tourists arriving from these countries.

The availability of port facilities for people with limited mobility is a significant benefit in general because it offers social inclusion which allows people from visiting ports and harbours. Unfortunately, such infrastructure is not readily available to port visitors hence visitors depend on the geospatial configuration of the ports.

Tourists are increasingly travelling with their pets, and while such an offer was not included in this study, it is one of the branches that should be investigated in order to round out the tourist offer.

Sporting fields and facilities also contribute significantly to the enhancement of the tourist offer. Split-Dalmatia county cities are fairly developed in terms of cultural events and infrastructure needs thanks to high dependency on tourism, especially during summer when most visitors visit ports in the county however some ports are still slightly "under-equipped." By no means does this imply that those ports are struggling to find customers; on the contrary, more and more people are fleeing from crowded areas to areas such to those that are a little more secluded such as Vis or secluded parts of the island offering more peace and tranquillity.

In the category of sports activities (windsurfing, sports clubs, sailing schools, and diving schools), 29 of the 54 ports in the county offer such activities, implying that only 44% of ports have no additional content related to sea-related sports activities. Other sports and wellness facilities are distributed similarly. There is no clear distinction between 'bigger' and 'smaller' ports, as some smaller ports on the Island of Brač provide more sport activities and facilities than some larger ports in the vicinity of Split, for example.

9% of ports offer windsurf courses, 33% of ports have sailing courses and 44% of ports have diving schools as part of activities offered. Other sports offered are kayaking, zip lines, tennis (11%), soccer (17%), 15% swimming pool and 15% gym.

With the ever-increasing demand for various types of SPA and beauty centres, wellness facilities are an essential accessory in today's world. 76% of Split-Dalmatia county ports have at least one type of wellness facility (SPA centre, health resort, medical centre, beauty centre, hair salon, or barbershop) in their immediate vicinity. Same as sports facilities, they are usually located at town and or hotels in the port vicinity, not in the ports themselves.

Table 5: Average distance (Split-Dalmatia county ports – transport and facilities)

Train station	16,5 km
Airport	34 km
Bus station	0,7 km
Highway	23 km
Police station / Fire department	7,8 km
Hospital / Quick medical service	4,6 km

Mobility is high on the agendas of government institutions, particularly in tourist-oriented ports that provide cheap and quick mobility during the tourist-heavy summer months.

Various modes of vehicles for rent are available throughout ports and harbours to facilitate movement on land. Quad vehicles are available in nearly 26% of ports, cars in 67%, bikes in 52% and motorbikes and electric scooters in 54% of ports.

4. SWOT analysis on small ports phenomenon

A research tool known as SWOT analysis was used to analyze the development of small ports and nautical tourism in Split-Dalmatia County. SWOT analysis, also known as situational analysis, is an intuitive method of examining and evaluating the internal (strengths and weaknesses) and external (opportunities and threats) of the environment or factors in the function of observing the state and potential development of a specific phenomenon, in this case, the small port phenomenon.

Table 6: Split-Dalmatia County ports SWOT analysis

<p>Strengths</p> <ul style="list-style-type: none"> • Location • Mediterranean mild climate • Great sights (history) • Proximity to emissive markets (easily reachable by car) • Natural beauty and richness • Accessibility (car, plane) • Great transport infrastructure (e.g. roads) • Good tourism infrastructure (hotels, hostels, camps, apartments) • Safe location • People speak foreign languages well • Mobility • Good tourist offer (both beach and active holidays offered) 	<p>Weaknesses</p> <ul style="list-style-type: none"> • Space constraints in ports • Insufficient berths availability • Bureaucracy • Non-existing standardisation of nautical ports • Tourism season seasonality results in crowded locations • Additional services offered to nautical tourists • Level of expertise in ports • Missing • Missing environmental standards across the country (waste management etc) • Missing a tourism strategy that would round out the offer (nautical tourists)
<p>Opportunities</p> <ul style="list-style-type: none"> • Active tourism potential still unused • Hospitality staff education can still be improved • New markets potential • Foreign investments could lead to improvement in standards • Using the film industry potential (promotion) • Possibility to extend the season to the year long months instead 4-5 max 	<p>Threats</p> <ul style="list-style-type: none"> • Mass tourism • Ecological disasters (pollutions) • Financial crisis • Global epidemics • Paving the coast, which detracts from its natural attractiveness • Lack of regulations for monitoring and protecting the coast • General lack of regulations

<ul style="list-style-type: none"> • Extending the offer of services to the boaters • Further improvement of transport infrastructure (train fx) 	
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The SWOT analysis is a matrix of questions and answers about factors that could affect the overall performance of small ports. This type of analysis is carried out in collaboration with a group of nautical tourism experts and managers, as well as coordinators and moderators. SWOT analysis is a tool that helps detect and identify key development factors, development potentials, and development constraints. As such, it is a critical step from analyzing the current situation to considering the future, desired and possible, and determining the development vision, strategic goals, measures, and projects.

Nautical tourism ports continue to fall short of the required level of structure and quality of offer that boaters expect, especially when compared to the natural ambient characteristics and benefits that Croatia and Split-Dalmatia County are endowed with. Due to a lack of additional content, ranging from port accommodations and sports fields to restaurants, nautical equipment shops, supermarkets, boat services, cranes, slipways, and so on, the ports' income is significantly lower than what is possible, and their structure is unfavourable.

The most significant advantages are favourable natural characteristics, such as a high degree of indentation of the coast, connectivity and complementarity of the island and coastal belt, existing tourist infrastructure and capacities from other activities, and the benefits of locations for the construction of various types of tourist ports and other nautical - tourist capacities. However, in addition to the benefits mentioned above, nautical tourism has some drawbacks that must be addressed to compete successfully in the global nautical market.

Some negative factors, respectively the shortcomings of nautical tourism and the limiting factors of its development are seasonal character activities in nautical tourism, occupation of the sea and the coast, usurpation of the coast, sea pollution with oil and its derivatives, bacteriological pollution of the sea by wastewater and substances, the devastation of biological resources of the sea, pollution of the sea with various wastes and impurities and the destruction of fish and water resources.

Seasonal character activities in nautical tourism, occupation of the sea and the coast, usurpation of the coast, sea pollution with oil and its derivatives, pollution of the sea by wastewater and substances, the devastation of biological resources of the sea, pollution of the sea with various

wastes and impurities, and destruction of fish and water resources are the negative factors, respectively the shortcomings of nautical tourism and the limiting factors of its development.

5. Summary and conclusions

The goal of this regional report was to provide an overview of the current state of the Split-Dalmatia county ports Port Authorities and port areas under their management through the processing of data collected through the project partner IUAV's questionnaire and obtained through interviews with county port authorities.

Even though Split Dalmatia County ports have one of the best chances for success due to their favourable location in the Mediterranean and proximity to neighbouring countries with similar views on the sector, even development is out of reach. The majority of the small Adriatic ports are classified as "satellite ports," which means they serve a purpose as a temporary hideaway, as some of the berths are improvised with homemade equipment. Some of them are illegally constructed and artificially prolonged, resulting in no structural cohesion between berthing piers.

As stated throughout the report, limitations due to space constraints and centralization appear to be the most significant impediment that is unlikely to be overcome anytime soon, as the majority of the content and tourist offer is concentrated in larger cities (and ports). When levels of overcapacity hit in larger ports, the natural flow of development would have to be in the form of an outflow. This was proven to be correct in the years preceding the COVID-19 pandemic. Ports began to reach peak docking and passenger numbers, and at that point, every available space that remotely resembled a berth began to attract nautical clients.