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# Croatian ports of international economic interest with a focus on the tourism development perspective of the Port of Zadar

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## ABSTRACT

The Croatian coastline, as well as various natural and man-made attractions in the Croatian hinterland, provide for a fairly well-developed tourism sector. National marine ports play an increasingly important role in promoting and developing the tourism sector. Zadar is the second largest domestic and international passenger port in the country and the third largest cruise port. In addition, the port serves several anchor clients in the dry bulk, liquid bulk and general cargo sectors. After analyzing Croatian ports of international economic interest in general, trends and developments in the port sector, and the destination states of Croatian ports, the authors in this paper focus on the segments of the Port of Zadar that are important for the development of tourism. The paper provides an overview of the current state, recommended targets and status of the Port of Zadar. Further, the paper predicts targets for passenger traffic (domestic, international and cruise) by 2030.

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## 1 Introduction

Croatia is a Mediterranean country with indented coastline and islands by which it is known internationally. The Republic of Croatia is located on the east coast of the Adriatic Sea. It is a maritime country with a long history and tradition of maritime and tourism (Development strategy of nautical tourism of the Republic of Croatia, 2008:3).

Countries that have a coastline are considered to be connected to the whole world, thanks to infrastructure and legislation as a fundamental aspect of marine and maritime affairs (Luković et al., 2015). Tourism begins and ends with travel. Transportation directly influences tourism through the movement of people. The communication elements of the tourist offer are the entire transport infrastructure towards the emitting market – the destination – and different types of transport. Among them, the passenger ships of sea lines occupy a special place (Vidučić et al., 2008).

Tourist service is closely connected with transport services. Without transport service there is no tourist service,

because transport service always precedes tourist service. Transportation and tourism are important because they enhance people's well-being. They are promoters of the Croatian economy and should be accepted as such, with all the necessary investments. Both activities have a positive impact on the economic performance of other activities (Klarić, 2002).

So far, several authors have analyzed the interconnectedness of passenger transport and tourism in Croatia. It is pointed out that Croatia has never paid enough attention to transport and tourism (Dundović, 2003). However, regular passenger transport, alone or in cooperation with other forms of transport should play a particularly important role in the development of coastal tourism (Hitrec, 2002). Liner passenger transport is a prerequisite for the development of island tourism (Jurčević and Budor, 1999). It is assumed that transition countries will have to make significant efforts to build adequate transport, tourism and economic infrastructure in order to strengthen their competitiveness as much as possible, focusing on raising the level of transport and tourism services (Jurković et al., 1999; Vidučić et al., 2008).

Sea passenger ports are one of the most important preconditions for the development of transport, tourism and economic activities in the function of tourist offer and satisfying the transport needs of passengers. The optimal development of the passenger port system can only be achieved through a well-managed port policy in accordance with the goals and measures of the general economic policy. The peculiarity of ports is that they are not an end in themselves, but are in the function of service users, so everyone who benefits from ports should be interested in their business and development (Jugović et al., 2007).

According to Glavan (1992), passenger shipping is a special type of maritime shipping that continuously carries out maritime transportation of passengers using special ships. Considering technological, as well as organizational and economic criteria, one of the most important types of maritime shipping is passenger shipping, which can be further divided into liner shipping and tourist shipping. Cruises are counted as part of tourist passenger shipping.

Looking at the overall organization of ferry transport in Croatia, a complex structure of ferry lines can be identified in terms of routes, but also in terms of their function (Opačić, 2022). Liner passenger transport, alone or in cooperation with other modes of transport, should play a particularly prominent role in the development of coastal tourism (Hitrec, 2002).

## 2 Trends and developments in the ports sector

This section presents a summary of the most relevant trends and developments that are currently ongoing in the ports and maritime sector. The port and maritime transport are influenced by many trends and drivers which are wide ranging topics from policy to economics issues and from technology to environmental issues. Key is the sustainability with respect to the developments. Many of the developments are outside the control of the Port Authority but the developments trigger opportunities and treats on which proactive management by the Port Authorities is re-

quired. The trends and drivers are discussed around the following sectors (Figure 1).

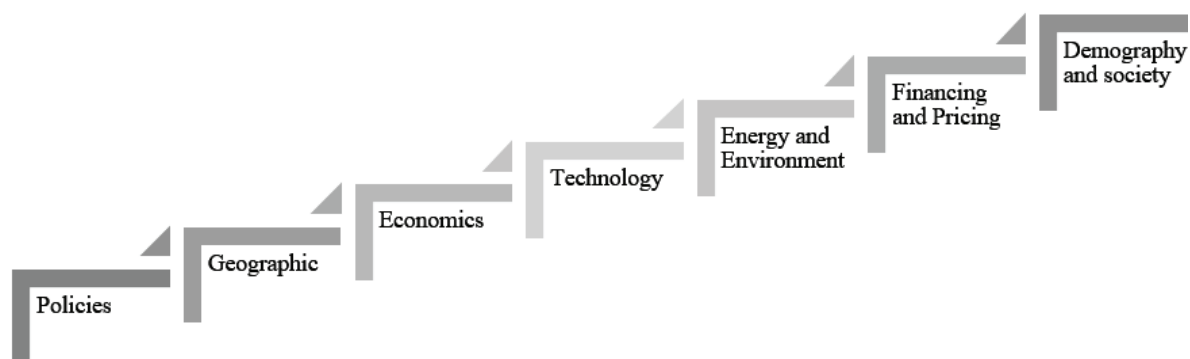
Considering policies, national and international laws and regulations influence the daily management of the Port Authority. Most importantly are the regulations by the IMO, SOLAS and the EU next to the national legislations such as the maritime domain act and the cabotage law which will cease by end 31<sup>st</sup> December 2016.

Croatian ports have the benefits of natural sheltered waters from the geographihic point of wiew. The Croatian ports Rijeka and Ploče are well positioned for a gateway and transit port for Central and East Europe. The port of Zadar has a flat hinterland and is well positioned for RoRo and spacious project cargoes. The ports of Šibenik and Split are cargo ports which also attracts cruise vessels. Dubrovnik is regarded as Croatian first ranked cruise destination and hold opportunities to develop as home port for cruise.

Economics drive the transport chain. Commodities would always flow along low cost solutions where service and efficiencies are at acceptable levels. Global economic trends relate to: Globalization of trades, China's Maritime Silk Route, European production moved South and East, Society is changing from industry to commerce and tourism, Economies of scale & larger vessels, Overcapacity and lower freight rates, Panama Canal expansion set new design parameters, Consolidation amongst shipping lines.

Technology drives todays transportation flows. The industry is highly capital intensive and efficiencies come mostly through major improvements such as the requirements of new port cranes. However, next to those, many technological and efficiency improvements and be reached through appliances of SMART technologies today's mobile and IT systems offer.

One of the main trends of Energy and Environment is the adaptation of green policies. The reduction of greenhouse emissions is to become top priority of the port and transport sectors as new regulation for the sector is being draft at EU and international levels. This means



**Figure 1** Trends and developments influencing port sector

that awareness is not sufficient, key is to “measure, control and act” to reduce greenhouse emissions. Proactive steps should be considered to become a “green port” and to reduce emissions both on shipping, road and rail transportation.

Regarding Financing and Pricing, ports in a landlord system in Europe have to become self sustainable. This should become prime objective for the commercial activities at ports. Part of this objective is the transparent financial reporting. In order to understand the competitiveness of ports frequent competitive tariff benchmarking should take place. In the financing sector there is a trend towards more Private funding rather than Public funding.

Talking into account Organisation, Demography and Society, Landlord Port Authorities in Europe have become stand-alone entities through a process of commercialisation, corporatization and privatisation. Emphasis is the commercialisation aspect on commerce and marketing and a client account approach in order to become fully customer oriented and to become financially self-sustainable. Further the organisation should emphasis the Safety, Health and Environmental issues next to quality assurance through ISO certification. Regarding demography and soci-

ety trends, it can be noted that industrial ports have been moved out of the cities.

This classification of trends shows how the most important trends follow from the different drivers, and what this may mean for the port industry in the future.

### 3 The Croatian port systems

For each coastal state, including the Republic of Croatia, the balanced development of port traffic capacity is crucial because it directly and indirectly determines the development of all other surrounding areas and other economic sectors. The Croatian port system now meets the needs of the maritime traffic in the availability of the necessary infrastructure and reception facilities, but the competitiveness of commercial port services is not optimal in the context of usage of available resources. Therefore, the focus of the development of the port system in the context of international maritime transport should be aimed at raising the competitiveness of the ports of special (international) economic interest for the Republic of Croatia in relation to the port in the region, in order to redirect international traffic through the Croatian port system.

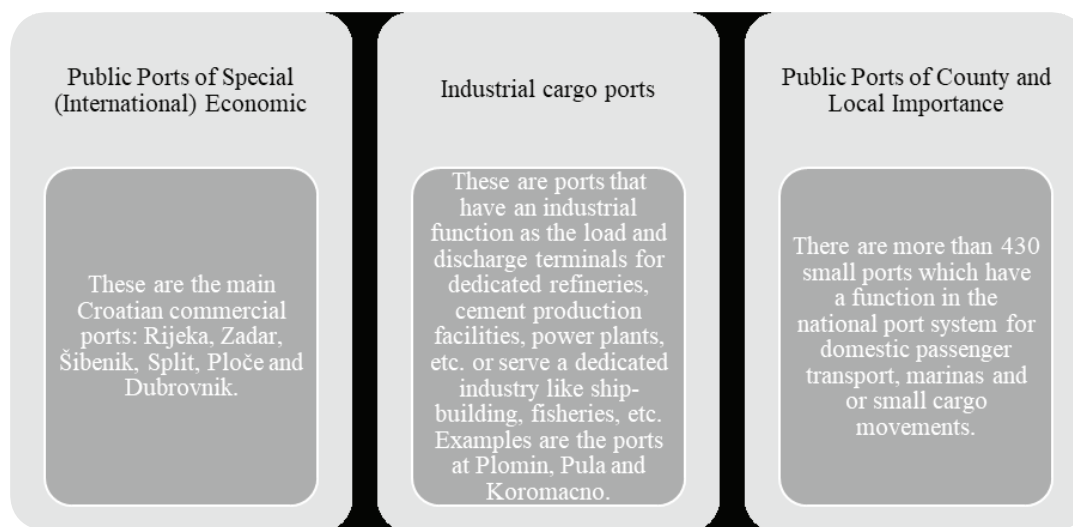


Figure 2 The Croatian port systems

Source: Authors

Table 1 Croatian Port Functions

Port	Cargo	Cruise	International Ferry	Domestic Ferry
Rijeka	✓	✓	✗	✓
Zadar	✓	✓	✓	✓
Šibenik	✓	✓	✗	✓
Split	✓	✓	✓	✓
Ploče	✓	✗	✗	✓
Dubrovnik	✗	✓	✓	✓

Source: Authors



**Figure 3** Croatian ports of special (international) importance

**Source:** CEEC-CHINA Secretariat on Logistic Cooperation

This article only focusses on the first classification, namely the ports of special (international) economic interest for Croatia with special interest on port Zadar. Ports of special (international) economic interest have the following main functions: cargo, cruise, international ferry and domestic ferry shown in Table 1.

One of the significant potentials for future development of the Croatian society and economy is precisely the Croatian geographic position, its maritime navigation, and the fact that the Adriatic Sea with its harbours deeply rooted in the European continent.

Therefore, traffic integration and effective transport links with the Croatian and European hinterlands are of crucial importance for the development of Croatian society and economy. Croatian sea ports located along the Adriatic coast are the key points of the Croatian transport system and should play a key role in its development.

In this article there will be development prepositions such as: the specialization of ports in accordance with possible demand, increasing the sustainability of the system by reorganizing the sector, improving maintenance efficiency, reducing environmental impacts and measures to increase the security and interoperability of the systems and improving access to ports and their connections with other means of transport to encourage the development of intermodal transport.

In the last 5-10 years, the economic environment in which the Croatian ports operate has largely changed.

Available and economically justified technologies and associated transport systems have changed significantly, and further changes are to be expected in the future, primarily because of the greater integration of the Croatian transport system in the transport system of the EU.

Therefore, it is necessary to create a harmonized framework for the development of Croatian ports for the period until 2030, which will be the basis for their further comprehensive and sustainable development, as well as for the development of the entire system of the Croatian maritime industry and tourism.

### 3.1 Overview of the Croatian system of ports of special (international) importance

The Croatian ports system consists of the ports of Rijeka, Zadar, Šibenik, Split, Ploče and Dubrovnik. Within the diverse ports system, cargo flows, passenger traffic flows and flows of cruise passengers are handled at each port. Each of the ports have their specific function within the system, often based on historic developments.

Croatian system of Public Ports of Special (International) Economic Importance consists of the following ports and their main activities:

Rijeka is Croatia's most important commercial cargo port, with a strong position in serving the Croatian economy. The port handles primarily containers, general cargo, livestock, iron ore and coal, other dry bulk and crude oil.



Zadar is the country's second largest domestic and international passenger port and third largest cruise port. Further, the port serves several anchor clients in the dry bulk, liquid bulk and general cargo sector.

Šibenik, the smallest Croatian port, both in terms of cargo, passenger and cruise volumes. The port serves its local anchor clients and is increasingly benefiting from the cities improving nature.

Split is Croatia's most important passenger port, serving the larger islands in front of the Croatian coastline, as well as the flow of international passengers from Italy. Further, the port also has a relatively modest position as cargo port for the local hinterland, consisting of the Split/Dalmatia region and parts of Bosnia and Herzegovina.

Ploče is Croatia's second largest commercial cargo port, with a strong position in serving the Bosnia and Herzegovinian economy. The port handles primarily dry bulk for the Bosnia and Herzegovinian industry, containers, general cargo and increasingly also liquid bulk products.

Dubrovnik is the country's most important cruise port, facilitating the tourist that aim to enjoy the historic city of Dubrovnik. Further, the port also facilitates domestic and international passenger transport, primarily to and from the nearby islands (domestic) and to and from the south of Italy (international passenger transport).

In the next section, a Strengths, Weaknesses, Opportunities and Threats analysis (SWOT) of the Croatian ports system is provided.

### 3.2 SWOT of the Croatian ports system

The following table (Table 2) provides the results of a SWOT analysis of the Croatian ports system divided in three segments: port planning and organization, port finance and economics and port development and engineering.

Before taking any strategic decision, it is essential to diagnose the specific port. SWOT analysis is the most simple and effective method to decide on the future. It will help raise the actions to be put in place to take advantage of opportunities and to prepare the port detected threats being aware of their weaknesses and strength (Párraga et al, 2014).

### 3.3 Target state of individual ports

The present section provides the proposal for the transformation of the Croatian Ports Sector. The target state, roles and functions of each of the individual ports is discussed as following figure (Figure 4) schematically depicts the recommended priority activities for all six ports.

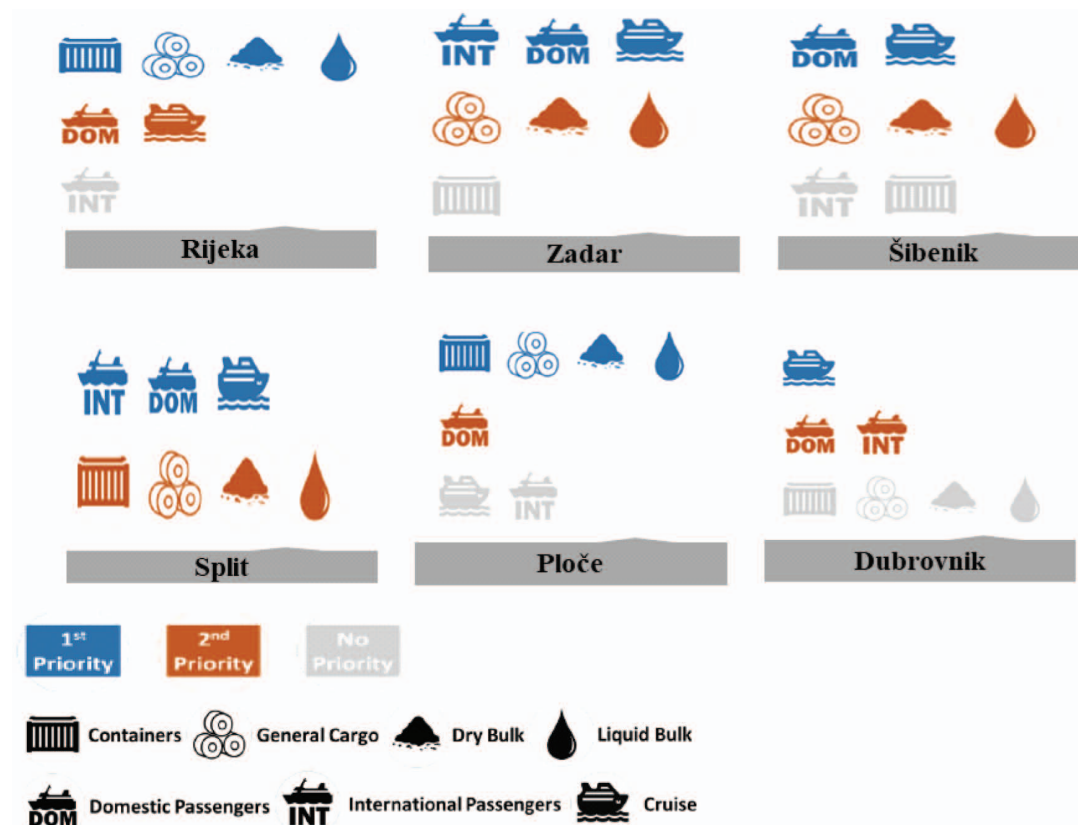


Figure 4 Target state of Croatian ports

**Table 2** SWOT Analysis Croatian Ports Sector

	<b>Port Planning &amp; Organization</b>	<b>Port Finance &amp; Economics</b>	<b>Port Development &amp; Engineering</b>
<b>Strengths</b>	<ul style="list-style-type: none"> <li>– Croatian ports have the natural strength of being located on rather deep drafted coastlines, with natural coastal barriers, providing safe and easy navigation of even the largest vessels.</li> <li>– The location along the Northern Adriatic coast provides a strategic strength for the Croatian ports, as large parts of Central and Eastern Europe belong to the country's natural hinterland.</li> </ul>	<ul style="list-style-type: none"> <li>– The Croatian economy, as well as the economies of countries belonging to the country's natural hinterland are reviving after the global economic downturn.</li> <li>– As part of a long-term trend, which has been accelerating after accession to the EU in 2013, the Croatian and international private sector is increasingly involved in former publicly owned enterprises, including the former publicly owned port operations companies ("Luka's").</li> </ul>	<ul style="list-style-type: none"> <li>– The Croatian ports system is rather well-developed in terms of port infrastructure quality and infrastructure availability.</li> <li>– Croatian road infrastructure, especially the parts that have been developed recently, is regarded to be of high quality. Further, the network is generally well-connected to most of the county's ports.</li> </ul>
<b>Weaknesses</b>	<ul style="list-style-type: none"> <li>– Generally said, recent port developments in Croatia have lacked a realistic and consistent commercial feasibility study process. Effectively, some port infrastructure investments seem to have been driven by public interests, strategic considerations or political motives.</li> <li>– Port authorities act like typical governmental organizations, with limited to no focus on marketing, pro-active management and performance benchmarks.</li> <li>– Some of the smaller Croatian cargo ports have a substantial dependence on a few anchor clients.</li> </ul>	<ul style="list-style-type: none"> <li>– Generally, the Croatian ports strongly rely on government donations and repayment support in order to be financially sustainable.</li> <li>– The applicable system of light dues, in which vessels effectively pay for maintaining the service of lighthouses, poses a substantial competitive disadvantage for Croatian ports. The system is absent in competing ports.</li> </ul>	<ul style="list-style-type: none"> <li>– Especially compared the other European ports, the implementation of advanced IT technology and other advanced technology applications is lacking behind.</li> <li>– For most types of cargo handling, the productivity of Croatian ports is considered low, especially in comparison with competing ports. Further, Croatian port authorities generally do not measure or monitor port performance, disabling them to manage the concessionaires.</li> </ul>
<b>Opportunities</b>	<ul style="list-style-type: none"> <li>– The Croatian entry to the EU creates connections with large parts of the EU and full connection to the European TEN-T network.</li> <li>– Engaging in the process of port commercialization with the long-term ambition to create corporatized port authorities should result in a better management, marketing and monitoring of ports, their management and performance.</li> </ul>	<ul style="list-style-type: none"> <li>– The Croatian entry into the EU opens up additional opportunities for the use of ESI funds.</li> <li>– The shift of all types of industrial production to countries in Eastern Europe creates throughput opportunities for Croatian ports.</li> </ul>	<ul style="list-style-type: none"> <li>– The Croatian ports can build on their potential by implementing both green technologies, IT applications and sustainable developments</li> <li>– The Croatian ports sector can already prepare itself for implementation of the SECA zone within the Mediterranean and Adriatic, by investing in low sulphur bunkering facilities, LNG bunkering facilities and low-sulphur port dues incentives.</li> </ul>
<b>Threats</b>	<ul style="list-style-type: none"> <li>– The slowly implemented process of private rail operations results in an underutilization of rail infrastructure from Rijeka. On the hand, this process has been implemented faster in Slovenia, causing stronger competition for Hungarian cargo.</li> <li>– In general, the relation between Port Authorities and concessionaires is not professional enough.</li> <li>– For some ports, the continuation of the business of anchor clients is doubtful, creating a risk of cargo flow discontinuity.</li> </ul>	<ul style="list-style-type: none"> <li>– The applicable Maritime Domain and Seaports acts seems to limit the ability for private investors to own immovable assets built on the maritime domain. As such, BOT or BOOT contracts in operation of terminal facilities or construction of port infrastructure prove difficult to implement.</li> <li>– In light of the financial restrictions that Croatia is currently facing on a government level, port authorities' dependence on government donations and repayment support causes a national financial burden.</li> </ul>	<ul style="list-style-type: none"> <li>– Although the general quality of port infrastructure is good, some of the recent port infrastructure developments seem over dimensioned, causing a risk of overcapacity.</li> <li>– The lack of pro-active management, policies and systems relating to environmental management, safety and health systems of the ports creates a potential competitive disadvantage, especially because competing ports in Europe are way more advanced in this field.</li> </ul>

Source: Authors

Rijeka maintain the function of Croatia's most important cargo gateway port, aim for a function as cargo transit port for Central and Eastern Europe. The port will build upon its potential, by utilizing the incorporation in both the Mediterranean and Baltic-Adriatic TEN-T corridors. Secondary priority activities should be domestic passengers and cruise business. The city-port relationship is very important, especially due to the port developments in the Rijeka basin.

Zadar maintain the function of Croatia's second largest passenger port, serving the smaller islands on the Dalmatian coast. Further, Zadar should increase its international passenger handling activities and cruise business, to further build upon the touristic nature of the Zadar region. Cargo handling activities (including project cargo opportunities) should be seen as a secondary priority, while the functions for current anchor clients and concessionaires should be maintained.

The port of Šibenik should maintain its function as domestic passenger port and luxury cruise port. The handling of cargo should be regarded as secondary priority, while the function should be maintained for current anchor clients and concessionaires.

The port of Split will further build upon its position as the country's primary passenger port, serving both international and domestic passenger flows, both towards the larger islands on the Dalmatian coast and to and from Italy. Another priority activity will be the accommodation of the cruise business. A secondary but also important function for the port of Split will be the handling of regional cargo activities, serving primarily the Dalmatian region and parts of North-West Bosnia and Herzegovina. For the passenger port of Split, it is important to maintain and improve the relationship with the city, especially with regards to traffic congestion in the city.

The port of Ploče will continue to act as most important cargo transit port for Bosnia and Herzegovina. Further, the port will aim to have a more important function as cargo transit port for other Central European countries along Pan-European Corridor VC. Both cruise and international passenger traffic are not considered priority activities for the port of Ploče.

The port of Dubrovnik will continue to serve the tourism industry in Dubrovnik, facilitating the cruise business, as well as domestic and international passenger flows. Cargo activities will not take place in Dubrovnik.

#### 4 Port of Zadar

Main focus of this paper is port of Zadar, which will be presented in this section. Zadar is one of the Republic of Croatia's three main passenger gateways. In 2015 it welcomed 2 million ferry passengers both on domestic as well as international ferries, making it the country's second largest passenger port after Split. The port of Zadar also handles small quantities of general cargo, liquid bulk and dry bulk cargo.

The Port of Zadar Authority governs four port areas. The Old City Port houses two berths for international and eight berths for domestic passenger traffic. The new passenger port at Gaženica was opened in 2015 and boasts a modern overall infrastructure. It also has the benefit of direct highway access and its location relieves inner-city congestion. In total, Gaženica has five berths for international and seven berths for domestic ferry traffic. Also located in the Gaženica basin is the cargo port. The area comprises a total of six berths and serves all cargo types. Finally, the Vela Lamjana – Kali terminal located on Ugljan island provides facilities for fishing activities.

Cruise traffic has shown a substantial increase in the past six years. Since 2009, the number of cruise passengers calling at Zadar has increased on average by nearly 34% per year, totalling 70,000 passengers in 2015. Ferry passengers, however, has shown mixed performances. Domestic passenger traffic has stagnated since 2006, with just under 2.2 million passengers calling at Zadar in 2015, while international ferry traffic has steadily declined from 69,000 passengers in 2006 to 33,000 passengers in 2015. Domestic car traffic aboard ferries has shown a moderate 2% annual compounded growth since 2006.

The relocation of the passenger terminal to a new location has had a positive effect on the increase in passenger and cruise traffic can be seen in the statistics below.

**Table 3** Domestic traffic of passengers and vehicles for the period from 2015 to 2020

Year	2015	2016	2017	2018	2019	2020
Number of passengers	2,156,480	2,238,312	2,348,950	2,354,127	2,390,575	1,723,512
Number of vehicles	360,475	397,618	429,321	457,117	484,69	415,429

Source: Official web page Port Authority Zadar <https://www.port-authority-zadar.hr/>

**Table 4** International traffic of passengers and vehicles for the period 2015 to 2020

Year	2015	2016	2017	2018	2019	2020
Number of passengers	33,215	30,637	38,532	38,632	38,335	1,672
Number of vehicles	5,58	5,496	8,116	8,218	7,263	618

Source: Official web page Port Authority Zadar <https://www.port-authority-zadar.hr/>



**Table 5** Traffic of passengers on cruises for the period from 2015 to 2020

Year	2015	2016	2017	2018	2019	2020
Number of passengers	70,366	136,462	137,625	166,528	182,682	714

Source: Official web page Port Authority Zadar <https://www.port-authority-zadar.hr/>

**Table 6** Total number of passengers and vehicles for the period from 2015. to 2020.

Year	2015	2016	2017	2018	2019	2020
Number of passengers	2,260,061	2,405,411	2,525,107	2,559,287	2,611,592	1,725,898
Number of vehicles	366,055	403,114	437,437	465,335	491,953	416,047

Source: Official web page Port Authority Zadar <https://www.port-authority-zadar.hr/>

From the tables it can be concluded that the pandemic has certainly left its mark in all segments of passenger and vehicle traffic, as well as in the area of cruising.

The port of Zadar competes primarily with Šibenik and Split for international ferry traffic and cruise traffic. Their locations vis-à-vis the nation's most high-profile natural parks – Plitvice, Paklenica, Krka and Kornati – and the package deals on offer to experience them are the main sources of competition. Finally, each of three ports is closely located to groups of Croatian islands. The respective proximities of the three ports to the islands is such that they are not competing for passengers on these routes.

The Port of Zadar Authority is not financially sustainable. Despite growing sales revenues, reaching over 8.5 million Kuna's in 2015, a nearly 50% year-on-year increase, the profit excluding donations from the national budget still produces a loss of nearly 20 million Kuna's. Compared to 2014, this marks a 34% improvement in the Port of Zadar Authority's profit.

#### 4.1 Status and Targets of the Port of Zadar from the perspective of tourism development

Domestic passenger traffic is recommended for the port of Zadar to continue its strong current position as passenger port for the multitude of smaller islands in front of the Northern Dalmatian coast. Therefore, the port will continue to have an important public transport role. Domestic passenger traffic should be a first priority activity in the port of Zadar.

Considering international passenger traffic, it is recommended for the port of Zadar to strive towards a significant role in international passenger traffic to and from Croatia. The port has the shortest distance to Ancona (IT) and is positioned in the midst of typical touristic attractions in the Croatian hinterland. This proposition should be strongly marketed. The handling of international passenger traffic should be a first priority activity for the port of Zadar.

Cruise traffic is recommended for the port of Zadar to capture its potential as a one of the most important cruise

ports in Croatia. As such, the cruise business will be a first priority activity in Zadar.

Within the wider national ports system, the port of Zadar will continue its function as public transport port for passenger traffic to the islands along the North Dalmatian coast. Further, the port will benefit from its strategic position in the midst of the Croatian coastline, with flat hinterlands and close to many touristic attractions. This strategic position will primarily be reflected in the growth of the cruise business and the handling of international passenger and truck traffic. Finally, with regards to cargo, the port will continue to serve the local hinterland and current anchor clients. Potential infrastructure investments required for cargo-related activities will be initiated and financed by private parties.

Regarding city-port relation, the Gaženica port of Zadar has been developed outside the city limits of Zadar's old town. As such, it has decongested the old city town and has improved the handling of local road traffic as well as for tourist handlings. In contrast to the port of Rijeka, ample space is available for development. The current National Development Plan foresees no change in the location of Zadar port.

Considering port development towards 2030 and beyond it can be concluded that within the timeframe of the current National Development Plan, the port of Zadar is likely to be incrementally developed into an important domestic and international passenger port, with increasing importance of the cruise business. These activities are all destined to take place within the limits of the recently constructed Gaženica passenger port and a passenger terminal building. With regards to the cargo port, no major expansions are foreseen to be undertaken at the initiative of the port authority. In case private parties find the port of Zadar to be the ideal location for a dedicated terminal for a single activity such as imports of finished cars or project cargo, requiring investments in specialized infrastructure, it is recommended to organize private funding for such a development.

Considering institutional setting, as a result of port reform in the 1990s, the Port Authority of Zadar currently acts as a landlord port authority, managing the port that is

**Table 7** Port of Zadar targets for passenger traffic

Traffic Segment	Currently handled?	Growth potential 2030	Target	Location in port	How?
<b>Domestic traffic</b>	✓	+ / -	The port of Zadar will continue its important public transport function in domestic passenger traffic, servicing the smaller islands off the North Dalmatian coast.	Domestic ferry traffic will be serviced through the newly established Gaženica passenger port.	No major growth in the domestic passenger traffic flow is anticipated. As such, the port will continue to service the current domestic operator.
<b>International traffic</b>	✓	+ +	The port of Zadar will increase the importance of its role as international passenger traffic port.	International ferry traffic will be serviced through the newly established Gaženica passenger port.	Potential growth in the international passenger traffic will be captured through: – Increased marketing of the Zadar region as a holiday destination, to be carried out by the Port Authority of Zadar, as well as the city of Zadar. – Actively engaging ferry line operating companies to call at Zadar and promote Motorways of the Sea programs. – Facilitating smooth arrival and departure, amongst others by creating a passenger terminal at the Gaženica passenger port.
<b>Cruise traffic</b>	✓	+ +	The port of Zadar will continue to grow into one of the most important cruises destinations in Croatia.	Cruise traffic will be serviced through the new Gaženica cruise berths.	Potential growth in the cruise traffic will be captured through: – Increased marketing of the Zadar region as a holiday destination, to be carried out by the Port Authority of Zadar, as well as the city of Zadar. – Actively engaging cruise companies to call at Zadar. – Marketing Zadar as a home-port destination, a combined effort of the port authority, hotels, the airport and the city of Zadar. – Facilitating smooth arrival and departure, amongst others by creating a passenger terminal at the Gaženica passenger port.

**Source:** Authors according Ministry of Sea, Transport and Infrastructure (2016)

**Table 8** Capacity versus demand – Zadar – Passengers

	Design	Forecast 2025	Forecast 2030
<b>Domestic traffic</b>			
Passengers	3,200,000	2,600,000	2,900,000
Vehicles	520,000	436,000	481,000
<b>International traffic</b>			
Passengers	150,000	46,000	53,000
Vehicles	32,000	7,700	8,900
<b>Cruise traffic</b>			
Passengers	500,000	343,000	397,000
Calls	729	196	227

**Source:** Authors according Ministry of Sea, Transport and Infrastructure (2016)

operated by the port's concessionaires. The Port Authority of Zadar has two main functions. On the one hand, the authority has a public transport function for handling passengers from the domestic islands. On the other hand, the port has a commercial function in handling international passengers, cruise passengers and commercial cargo. With regards to the public transport function, it is to be expected that the Port Authority will continue to act as a public body, with limited focus on commercial targets and marketing. The commercial function of the port authority should be preparing towards commercialization, reducing the need for government support. Amongst others, this implies that the Port Authority will monitor, measure and act on the performance of its concessionaires.

In consideration of financial self-sustainability, with regards to the financial self-sustainability of the Port Authority of Zadar, it is to be stressed that the public transport function is not likely to be self-sustainable, especially when the system of port dues does not allow for the Port Authority to recap its investments. However, when it comes to the commercially driven function of the Port Authority, financial self-sustainability may indeed be expected on the medium to long term. When business units are created the commercial function versus public function would become measurable.

Considering Green Port Concept, to increase focus on the environment and sustainability, the Port of Zadar should aim to become a "green" port. The focus should be on implementing port-specific environmental management standards (PERS) which are promoted by the European Sea Ports Organisation (ESPO). The port should also introduce an incentive scheme to promote the low sulphur emissions by shipping lines. Further, the port is also to prepare itself for the introduction of low sulphur emission area in the Adriatic/Mediterranean, in which ships will be limited to low sulphur fuels utilisation by 2020. The port should also prepare for the provision of the clean bunkers, possibly also including LNG. Finally, the port should explore the possibilities for the introduction of clean energy technologies, both for the use of own electricity and that of clients and concessionaires.

## 4.2 Passengers capacity versus demand

For the port of Zadar, the capacity of the recently developed Gaženica passenger port is assumed to be sufficient to cater for demand up to the year 2030. The passenger port capacity largely depends on:

- The size of vessels used;
- The peak factor as a result of seasonality;
- The number of services that are offered;
- The frequency of services that are offered;
- The time taken to embark and disembark the vessels.

With the newly developed Gaženica passenger port, the port of Zadar offers 7 berths for domestic ferry's and 2 berths for international ferry's, the berths can handle various sizes of ferries. Also, there are 2 dedicated cruise berths of varying length. Further, the new passenger port offers ample space for the parking of cars and other vehicles, waiting to be embarking the vessels. Especially with the new passenger terminal, offering additional parking spaces, the port of Zadar will be ready to handle the forecasted number of passengers and vehicles.

The Table 8 provides an overview of the design parameters of the new Gaženica Passenger Port, versus the forecasted traffic figures.

It is concluded that the new Gaženica Passenger Port will be able to handle the forecasted demand for passenger and vehicle traffic.

## 4 Conclusion

The tourist development of the city of Zadar is based on rich historical and cultural attractions as well as on the exceptional wealth of natural resources. The indented coast and islands, an archipelago interesting for boaters and a mild Mediterranean climate are just some of the advantages of the city of Zadar. An increasingly important segment of tourism are guests on boat cruises that discover Zadar as an interesting destination.

Zadar is the 5th largest city in Croatia situated in the heart of the Adriatic. It is the urban center of northern Dalmatia as administrative, economic, cultural and political center of the region as one of the most powerful Adriatic traffic junctions where maritime, land and air routes meet.

One of the strongest points of Zadar is its availability of land suitable for development. The port area itself is over 30ha, but also, the back-up land adjacent to the port is flat and free for building. Other ports (except Ploče) either face to be surrounded by the city, either have immediately a mounting rig hindering further development.

Recently, Zadar opened a new ferry terminal Gaženica built along 1,420 meters of coastline, has 12 berths for ferries, 300 meters of coast for a new fishing port, and a 180 meter breakwater. Domestic passenger transport from the port of Zadar has been fluctuating in recent years. The increasing importance of the tourism industry in Zadar and Croatia in general is anticipated to steadily increase domestic passenger traffic from Zadar.

The port of Zadar, especially after Zadar has been elected as one of the best tourist locations in the world, is gaining in importance as an international passenger port. The new Gaženica passenger port and constructed terminal building are increasing the ports capabilities and facilities to receive international ferry lines. The port anticipates attracting one or several more international ferry lines.

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