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OPTIMIZING THE SPLIT PORT SYSTEM TO PROMOTE SUSTAINABLE DEVELOPMENT

SUMMARY

The facilities of the Port of Split are capable of accommodating a large number of passengers, cargo and vehicles. However, the road and railway connections between the port and corridor Vc are not able to handle such traffic density thus impeding the flow of goods and passengers. Because the route connecting the port passes through the town core, the conservation of the town's monuments and cultural heritage is a vital issue.
The Port of Split is the only departure point for overall passenger and car traffic to all the larger islands. Hence, the vision of the Stari Grad Port on the Hvar Island as the main connection with all other islands is of great importance, not only in the Splitsko-dalmatinska County but in the broader area as well.
In this paper the authors analyse the current state of the Split port system in terms of transport (Split's City Port and North Port) and the access to the City Port, with emphasis on design solutions. Special emphasis is placed on optimizing the port system while taking into consideration the importance of preserving cultural heritage and fostering sustainable development.

Key words: Split City Port, Split North Port, sustainable development, port optimization, traffic route, cultural heritage

1 INTRODUCTION

By the number of passengers and vehicles that pass through it, the Port of Split is ranked first among the Adriatic ports, while according to the statistical data it is ranked third among the ports of the Mediterranean. The rapid increase of passenger traffic, the growing number of vehicles, the tourism orientation of the Town of Split, the construction of the Zagreb-Split motorway and the greater number of flights to the Split Airport are factors that call for a different way of organizing traffic in comparison with the previous period. To reduce traffic congestion and transport speeds, a solution needs to be found for the access roads to the Port of Split, otherwise the entire ferry port needs to be relocated. In addition to being economically acceptable, the solution must be consistent with the principles of sustainable development and must not have an adverse effect on tourism development.

The 1990s witnessed a change in the habits of the population and in the modes of transport in the continental part of Croatia. The disruption of railway traffic brought about an increase in road traffic (transport by bus and passenger car), and as tourist arrivals started to grow once again after 1995, the Port of Split began to experience a mounting pressure. This required the port terminals in these areas to be expanded and the ports and the entire port system to be organized in a different, better way.

The port reconstruction and the construction of new piers, however, was too slow, thus indirectly impeding traffic links and traffic fluidity and increasing external costs. Pursuant to the 2005 Strategy of the Republic of Croatia which presented the long-term development policy of Croatian ports and maritime traffic, great importance was attached to the development of the so-called motorways of the sea which would help in equalizing traffic flows in Croatia and the EU.

The Motorways of the Sea Project aims at creating new intermodal logistics chains in Europe to help improve the access to markets throughout Europe. The participation in the Adriatic MoS Project opens up new opportunities for Croatia to develop short sea shipping and foster intermodality not only within its territory but also within the entire region. Intermodal logistics chains (combinations of sea, railway and road traffic, together with inland navigable waterways) seek to enhance the effectiveness of transport while reducing environmental pollution, costs and transport/travel times.

2 ASSESSMENT OF PREVIOUS RESEARCH

Research pertaining to this issue generally involves analyses and partial solutions to specific problems. Hence the importance of the Adriatic MoS Project in resolving the problem of an integrated combined traffic in the entire region, rather than just in partial areas.

Municipalities and towns have tended to resolve traffic problems for each segment separately, thus failing to take into account other stakeholders and factors directly linked to the overall issue. The Ministry of Maritime Affairs, Transport and Infrastructure, responsible for islands development, were in charge of resolving the issues of ports and quays, and in part, railway traffic issues as well. For a project to be realized, all stakeholders with an interest in this area of activity need to be recognized, and the project needs to be delivered collectively to avoid overlapping or partial project delivery.

Particularly important is the project concerning the Stari Grad Port on the island of Hvar, which should become the central link to other Adriatic islands. In this way, passengers wanting to travel from one island to another would no longer need to travel first to Split and then from there to other islands. The Stari Grad Port would become a link to all Adriatic islands, and would help to reduce the crowds and congestion in the Split's City Port Basin, especially in the summer months.

Equally important is educating the population to encourage changes in habits acquired in the 1990s, in particular, travelling by car, especially for short distances and in city traffic. In Croatia, passenger cars are largely used for travelling short distances (around town), mostly by a single passenger per car, which is environmentally and economically unacceptable. Educating the population would help them to again fall into the habit of using public means of transport. The European Commission has proposed a package of measures in the White Paper "A Roadmap to a Single European Trans-

port Area" [10] to improve the competitiveness and efficiency of the European transport system. The White Paper puts forward 40 different measures aimed at enhancing the mobility of freight and passenger transport, reducing congestion in key European transport hubs, and increasing the employment rate in the transport sector and other related sectors. The White Paper places special emphasis on sustainable development and environmental protection, and its primary goal is a reduction of transport-based environmental pollution by 60% by 2050, to be achieved by the proposed measures, especially by the measure encouraging greater use of railway and waterborne transport [10].

3 ANALYSIS OF SPATIAL AND OTHER FEATURES OF THE SPLIT CITY PORT

The Split City Port is especially important as a junction for all types of transport. In addition to maritime and road transport subsystems, the City Port area is connected with the broader region by other transport subsystems (railway, air travel and telecommunication subsystems) into a single transport system. Passenger and cargo transport is optimally distributed across all transport subsystems.

The Port of Split is located in the central part of the Croatian part of the Adriatic coast to which many inhabited islands gravitate. It is situated on the transport corridors between Rijeka and Dubrovnik, as well as between Split and Zagreb, and Ancona and Pescara in Italy.

A part of the Split transport system, the ferry port is located in the eastern part of the City Port. The ferry port handles domestic and international passenger and cargo transport throughout the entire year but especially in the summer months when there is a heavy flow of tourists towards the Central Dalmatian islands due to Split's favourable geographical position in terms of transport. This makes reaching the bus and railway terminal very difficult. The passenger port is located in the town's central zone, an area where all forms of the transport system, both mobile and stationary (road, railway and maritime transport), collide and are integrated.

Upgraded and expanded with two 140-metre wharves and two new, sophisticated 30-metre wide ramps, together with a new operating area of 2,770 m^2, berths 26 and 27 have raised the quality of services to port users, especially passenger and ship operators. They were officially opened on June 2013. These new berths represent the beginning of the final development of the breakwater of the City Port Basin, which is to be followed by the largest project – the construction of berths on the external side of the breakwater.

3.1 Spatial determinants of the Split City Port

The majority of transport activities take place in the port's eastern section which caters to all international and local ferries. Large cruisers and smaller passenger ships dock at the central customs pier. To avoid the problems of crowding and congestion and to help relieve the town centre, it is necessary to explore the possibility of relocating this form of transport to the area of the North Port which would put incoming and outgoing vehicles close to motorways and trunk roads. Such a change would make the Port of Split into a port of local and international transport for cruisers and passenger ships. Sveti Nikola Pier mostly accommodates catamarans and motorboats. The last berth on the pier serves as a border crossing in the summer when there is heavy traffic on international lines. External berths that have a sea depth over seven metres are used for accommodating cruisers on cruising voyages. The farthest berth, number 28, is exposed to strong southerly winds making it unsuitable for docking.

Sveti Duje Pier is mostly used by ferries and passenger ships on cruise voyages and it is a state border-crossing area.

For the most part, Sveti Nikola Pier and the Lazaretto Quay accommodate regular-line catamarans, high-speed crafts for transferring travellers from the airport to island destinations, and day-trip pleasure boats.

During summer, the Quay of Knez Domagoj is used by smaller-sized crafts in tourism traffic and smaller yachts on cruise voyages (resulting in heavy congestion in the summertime during waves of tourist arrivals).

The central part of the port between Sveti Duje Pier and the Quay of Knez Domagoj generally accommodates smaller ferries whose numbers are gradually dropping (Figure 1).

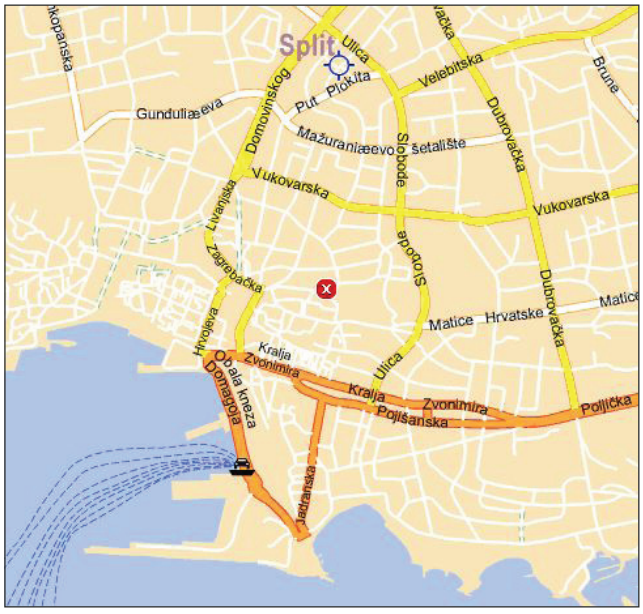

Figure 1 Road links with the Split ferry port

Source: www.faehren.amatori.com (2/9/2013)

3.2 Oceanographic conditions in the Split City Port

Measuring oceanographic parameters is vital for every port. However, measurements are not carried out in the City Port Basin because it is not equipped with the equipment needed for measuring wind speed and wave heights. The meteorological data needed are obtained from the data published by the Marjan weather station. The fact is that when a port is being built or reconstructed it is crucial to have oceanographic parameters measured continuously over a longer period of time. When other parameters are measured as well, the result is a clear picture of all events in that marine area (ecosystem).

In the Port of Split, a strong northerly bora wind makes it difficult for vessels to enter the port, while a strong southerly jugo wind creates problems in the western part of the port. The

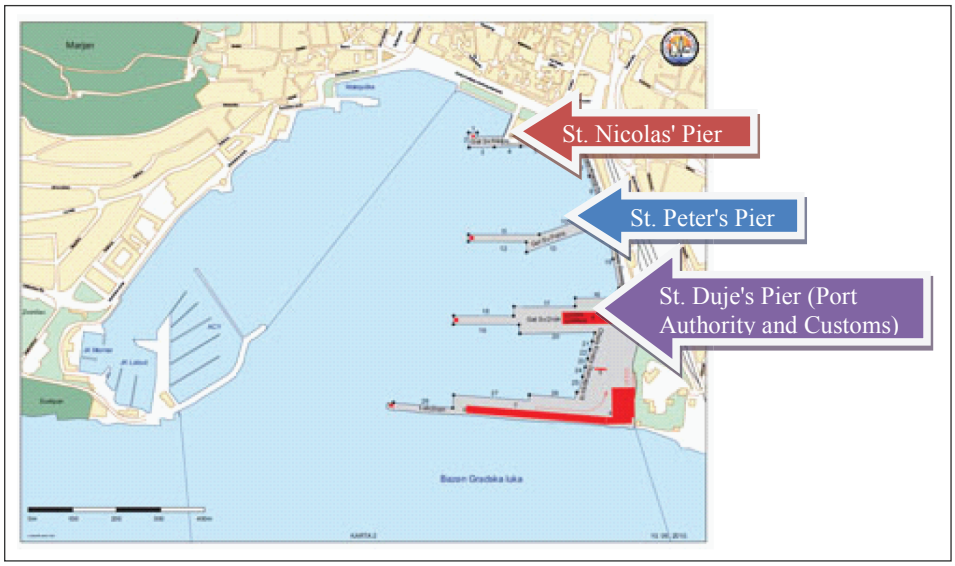

Figure 2 Split City Port Basin

Source: www. portsplit.com (Split Port Authorities), 2/8/2013

worst wind is oštro, because it blows straight from the open part of the port which has a small depth, causing large waves and making it difficult for vessels to stay in the port, particularly when their ramps are lowered. Sveti Nikola Pier and Sveti Petar Pier are especially affected by these problems.

Lebić is another unfavourable wind, but it rarely blows, while the winds *polenat* and *tramontana* have no effect on the port. The effect of the *oštro* and *lebić* winds could be avoided by further extending the breakwater on the northern and western sides of the City Port Basin [5].

4 ANALYSIS OF THE DESIGN SOLUTIONS FOR THE SPLIT CITY PORT

This chapter analyses the design solutions for the extension of the Sveti Petar Pier, the reconstruction and upgrading of the Sveti Duje Pier, the external berths of the City Port, and the access to the ferry port.

4.1 Extension of the Sveti Petar Pier

The Sveti Petar Pier in its extended form – 146 meters long and 16 meters wide – was opened on 17th August 2007. The south side of the operational quay is 135 meters long and has a 19.50-meter wide loading ramp. The north side of the operational quay is 156 meters long and has three water and power supply cabinets. The pier extension covers an area of 2,669 m^2. The extension of the Sveti Petar Pier marked the end of the first part of the Infrastructure Development Strategy, involving undertakings required to boost the Split's maritime development and ensure the improved accommodation of vessels, vehicles and passengers travelling through Split to the islands of Central Dalmatia. The extension of the pier was absolutely essential given that experts forecast that the number of passengers will grow to seven million by 2015, alongside a proportional increase in the number of vehicles [9].

An engineering company has developed the analytical basis for obtaining a location permit for the extension of the Sveti Petar Pier, located in a sheltered water area where vessels can be accommodated in all types of weather and sea conditions. The location ensures the safety of berthed vessels as well as the safe embarkation and disembarkation of passengers and vehicles. Throughout the entire year, the berths can be used for local and international ferries. The traffic area of the pier is organized to allow vehicles access to the extended part of the pier along a single 3-meter wide traffic lane, when, at the head of the pier, vehicles do a turn on its widest part. After this manoeuvre and prior to embarkation, vehicles park on a two-lane carriage-way that is 5.5 meters wide. When it is time to embark, drivers are required to drive their vehicles the back down the pier and over a new 19-meter wide ramp to embark onto a ferry or other vessel. The route vehicles take to join traffic remains unchanged. Vehicles use the port road to enter onto the traffic lane at the Quay of Knez Domagoj. The extension of the Sveti Petar Pier has provided the parking spaces needed (for 85 cars). A check point is located at the entrance to the pier to monitor vehicles entering and leaving.

4.1.1 Climate conditions of the location

The climate of an area represents a set of atmospheric elements and phenomena characterizing the average condition of the atmosphere determined by statistical medians and deviations based on long-term measurements and observation [3]. An area's climate features are determined by its geographical position and the orthographic characteristic of the environment [4]. When planning marine facilities, the most important factors in addition to the configuration of the coastline and sea bottom are dynamic marine processes – the effects of sea waves and currents, and the oscillation of the sea level [2]. Especially important are wind-generated sea waves and their interaction with natural or built coastline constructions. Such waves (with a swell period of 5 to 15 seconds) generate the greatest specific energy. Wind is also a vital factor in manoeuvring and mooring vessels.

Figure 3 displays the characteristic winds, mostly blowing from a NNE direction, as well as from the ESE and SSW. Because of its topographic position, the Port of Split is predominantly exposed to ESE and SSW winds. With some qualifications, strong NNE and N winds are considered as tramontana winds, while gale-force N and NNE winds are bora winds. Winds from an ESE direction and winds from a SE and ESE direction are generally considered

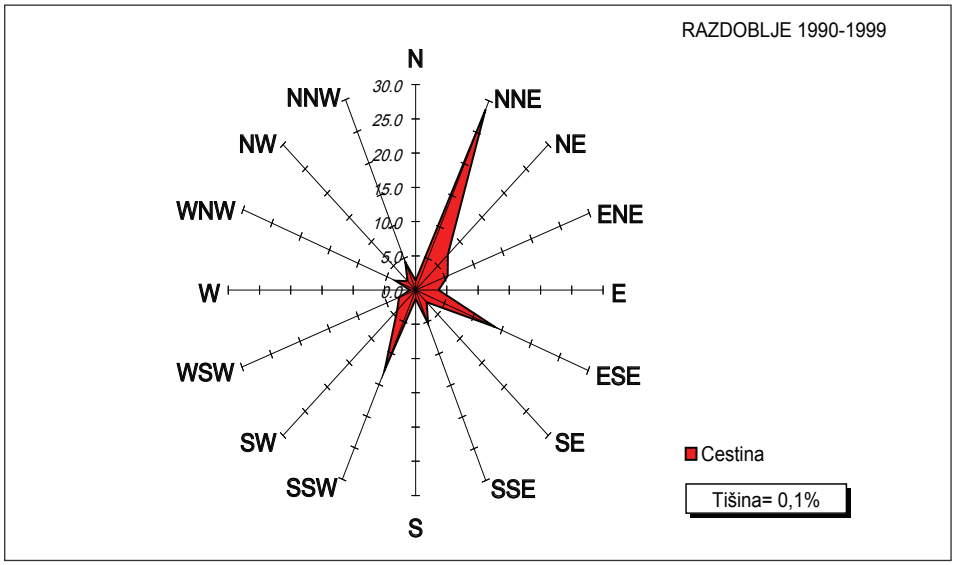

Figure 3 Annual rose wind, %, Split-Marjan, 1990–1999

Source: Analytical basis for the construction of the Sveti Petar Pier

as jugo winds, while SSW winds belong to the maestral wind. Based solely on the mean hourly values of the wind speed, it is not possible to clearly distinguish between the tramontana, bura, jugo, lebić and maestral winds because of overlapping.

4.1.2 Environmental impacts and environmental protection measures

Environmental impacts may occur during the construction phase or when the pier and ferry port are in use. Adverse effects to the sea are foremost evident, because that is where construction takes place. When vessels are berthed incidents may occur as a result of:

- faults on the vessels and incorrect handling of the equipment,
- faults on the quay and incorrect handling of the equipment and devices,

which cause fuel and oil leakages or fire to break out on board vessels. In case of pollution, the competent office at the terminal is obliged to notify the harbourmaster's office and the nearest company engaged in marine pollution prevention and removal. To contain the pollution, a floating barrier is to be put in the place and measures must be taken in compliance with the Intervention Plan for Cases of Sudden Sea Pollution. In case of fire on board a vessel that cannot be put out or contained, berth evacuation measures should be foreseen involving a minimum number of qualified persons. Hence, in addition to a well-organized evacuation procedure, good logistics ashore is also required.

The destruction of the environment and of the existing seabed was reduced to a minimum because the construction was grounded on reinforced concrete piles. Apart from environmental protection measures, safety measures are also absolutely essential and must be carefully planned [8].

4.2 Reconstruction and upgrading of the Sveti Duje Pier

The reconstruction and upgrading of the Sveti Duje Pier in the Port of Split was finished in 2010, providing a considerable number of new berths, enabling cruise vessels to berth at the pier and helping to lessen the burden of the Split-Supetar line, the busiest line in the summer months. The reconstruction and upgrading design was developed by the IGH Institute, IGH Design Sector, Water and Environmental Engineering Department [6].

It is of international importance that the Port of Split consists of two basins: the City Port Basin and the North Port Basin. The City Port Basin is developing into a complex passenger, ferry and tourist port and it is also an important urban area with cultural and historical assets. All forms of transport (road, maritime, railway and air transport) are present in the City Port,

Figure 4 Sveti Duje Pier

Source: www.skyscrapercity.com (4/9/2013)

which also provides a city and tourism public transport terminal, tour-operator transport, taxi service, and other auxiliary services and facilities (public car parks and garages, offerings and services to port users, etc.). Being the largest passenger ferry port in Croatia, Split has a vital role in organizing and conducting maritime transport, especially since it is connected through the City Port to a significant part of the Croatia's archipelagos. To the fullest extent possible, Split connects the Central Dalmatian islands of Brač, Šolta, Hvar, Vis, Korčula (the west part of the island consisting of the municipalities of Vela Luka, Blato and Smokvica) and Lastovo. Domestic transport accounts for 91% of passengers and 89% of vehicles passing through the City Port Basin. There are large oscillations in maritime transport during the year, because most of the maritime transport takes place during the summertime (over 60% in two summer months).

The area for which the Port Authority is responsible consists of 28 berths for domestic and international maritime transport, as well as berth number 18 at the head of the Sveti Duje Pier which is today mostly used for stern-to-quay anchoring of international vessels. The extension of the pier by a length of 150 meters resulted in two berths, 18A and 18B, thus increasing the capacity of the port and raising the quality of berthing at the stationary pier with two ferry ramps for embarking and disembarking vehicles and passengers. According to future development plans, this part of the pier will largely be used by domestic lines.

4.3 External berths of the Split City Port

The aim of the construction of external berths – that is, berths along the external side of the City Port's breakwater – is to accommodate large cruise ships to improve domestic and international line transport. The construction of these berths will have a direct effect on increasing the throughput of maritime and land transport in the City Port, and will provide the water area needed for ships to manoeuvre. The berths will form a unique spatial whole with the port road, the Sveti Duje Pier and the breakwa-

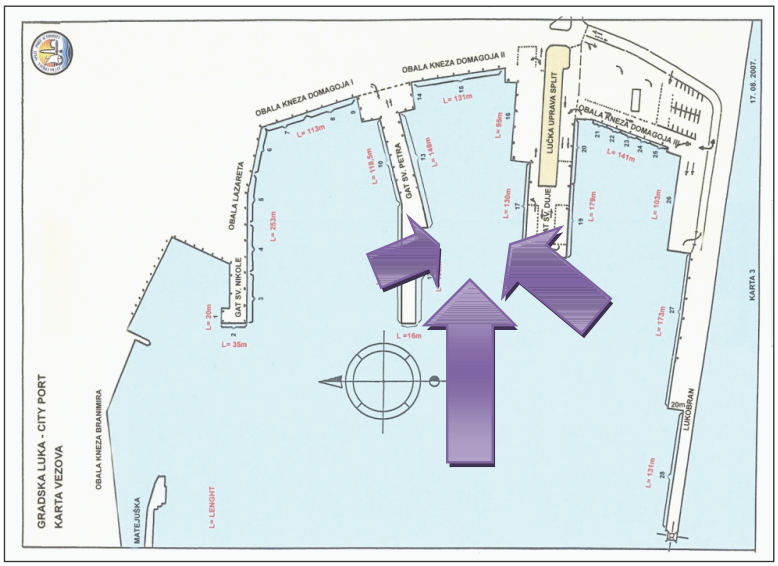

Figure 5 Split City Port – map of berths managed by the Split Port Authorities

Source: General Design by – INSTITUTE IGH d.d., IGH Design Sector, Water and Environmental Engineering Department (2009)

ter. In addition, they will ensure accommodation for ships up to 300 meters in length at one berth and for 320 meter long ships at the other berth. It will be possible to berth two passenger ships of the given dimensions at the same time. This transport solution provides for unimpeded driving and parking of buses coming to pick up passengers from cruise ships. The sea at the coast line must be at least ten meters deep. In addition to passenger ships, the berths should also be able to accommodate ferries (Marko Polo, Dubrovnik, Regina della Pace) and catamarans (Pescara Jet, Croatia Jet). A maritime study was conducted by the Faculty of Maritime Studies of Rijeka to analyse the different design solutions for external berths at the City Port breakwater. To ensure safe handling and embarking/disembarking of vehicles from ferries, an additional analysis of the transport requirements needs to be carried out with the aim of expanding the plateau for ferry loading ramps. Because of the limited water area bordering on the eastern part of the port, such a requirement entails reducing Berth 2 on the east by five meters. Accordingly, the overall length of the operative quay of Berth 2 would amount to 245 meters making it possible to berth vessels up to 265 meters in length [7].

4.4 Analysis of the handling costs

As cruise liners continue to burden the port's road traffic infrastructure, the construction of berths for cruise liners in the period 2015 – 2020 is sure to considerably enhance the use of space and make it possible to separate international from domestic passenger traffic more effectively. The accumulation of buses coming to collect cruise passengers will not place any additional pressure on the existing areas reserved for stationary traffic because these areas already serve passengers arriving at the new berths.

Figures 6 and 7 display a possible solution for freight vehicles (entrance – exit) to ensure less traffic congestion. When planning berths for cruise liners, it is vital to foresee a large enough area to accommodate a very large number of passengers and transfer them to their destination. Figure 8 shows one solution for an area for buses coming to collect cruise passengers.

To increase the capacity of the Port of Split and the number of berths it provides, it is necessary to resolve the issue of the port's access road. In recent years, experts have put forward a number of design solutions to the problem of access to the Split ferry port. Some solutions advocate using the ferry port exclusively as a passenger port and relocating the entire cargo

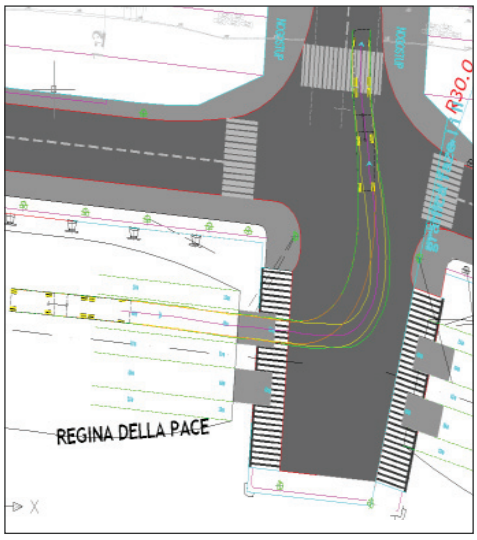

Figure 6 Coupled vehicle – Trailer truck (type ROA-NL, VA98, Region Europe, Total length 19.25 m), BERTH 1 (WEST BERTH) – ENTRANCE 1

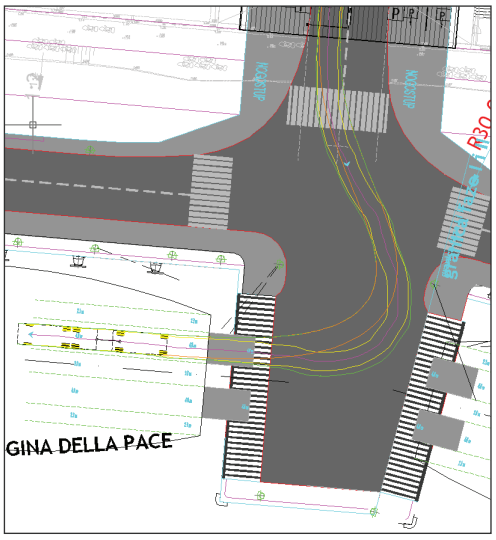

Figure 7 Coupled vehicle – Trailer truck (type ROA-NL, VA98, Region Europe, Total length 19.25 m), BERTH 1 (WEST BERTH) – EXIT 1

Source: General Design: External berths on the City Port breakwater – IGH (12/2011)

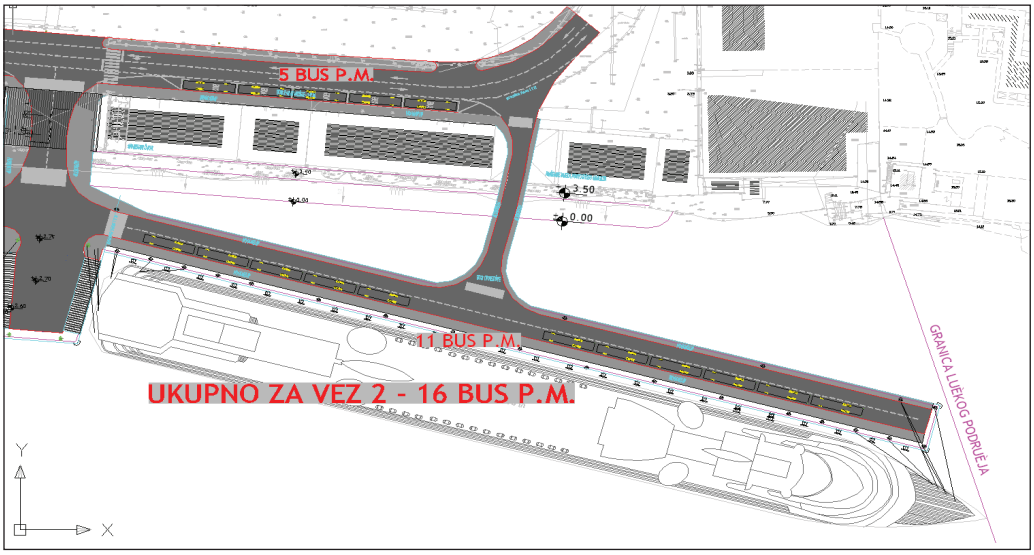

Figure 8 Area for buses collecting passengers from cruise ship at Berth 2

Source: General Design: External berths on the City Port breakwater – IGH (12/2011)

transport to the North Port (the North Port would need to be expanded, adapted to new conditions and given the appropriate auxiliary infrastructure). In this way, the Stari Grad Port on the island of Hvar would become the hub of the passenger traffic among the Central Dalmatian islands, which would lessen the pressure on the Split ferry port.

4.5 Design solution for the access to the ferry port

The design solution for the access to the ferry port proposes the possibility of accessing the ferry port from the north and east side using the earlier constructed traffic junction on Domovinskog Rata Street (ŽC-6139) and Poljička Street (DC-410) with Zbora Narodne Garde Street (DC 8), as well as from the west shore, providing an undersea tunnel is constructed. With the construction of the Split-Kaštel road, the access will be possible from the planned North Port-Dujmovača junction along the new road across Hrvatske Mornarice Street, Puta Supavla, etc. A number of corridors have been taken into consideration in connecting the City Port to the north:

a) From Domovinskog Rata Street to the crossing of Bihaćka and Vukovarska Street, along Livanjska Street and Zagrebačka Street to the Bishop Palace and then continuing along the coastal road.

b) The same as above, up to the crossing of Bihaćka and Vukovarska Street, then along the corridor of the covered railway track.

c) Although being the most reasonable solution, it cannot be realized because within this corridor there are two urban architectural solutions that make it impossible to build a road (the Small Mall, shopping-business-garage facility, and Contarini, a residential-business-cultural centre).

d) Another possibility is to use Domovinskog Rata Street, Sloboda Street or Dubravačka Street to Zvonimirova Street or Pojišanska Street.

e) Connecting the City Port from the east is possible from Poljička Road (D410) with the alternative use of Pojišanska Street and Zvonimirova Street or just Pojišanska Street.

In accordance with the above, the study has proposed the following possibilities for the main entrance to the ferry port:

- Using Pojišanska Street for one direction and Zvonimirova Street for the other direction, while joining the carriage-drives at the INA petrol station Pojišan, as is the case today.
- Using Pojišanska Street to enter the ferry port (man-made tunnel) and to exit (in the same corridor).

The selection of the direction is linked to the exploitative characteristics of the local road network (in this case Bjankinijeva Street). The planned four-lane road does not jeopardize the continuity of Bregovita Street which is to be used as one of the access roads to the future multi-story garage and to the Toć region for which it is today used. By connecting to Bjankinijeva Street (ultimately right – right), it will be possible to build the four-lane road by tearing down a small part of the Željezničar Building as foreseen in earlier plans (location on the crossing with Zvonimirova Street).

In the eastern part of the City Port, interventions to improve traffic are planned within the port itself and on the plateau of the existing railway station. The solution for the port entrance/exit foresees multi-lane roads in the direction of Pojišanksa Street (Poljička Road). At the covered plateau of the existing railway station, a so-called road solution "*cestovni rasplet*" is planned which will meet railway standards while allowing well-designed road connections with the embarking/disembarking plateau of the ferry port.

The study provides three basic versions of the road solution "*cestovni rasplet*" for this complex that connects to the Domagoj's Quay, Zvonimirova Street, Pojišanska Street and Bjankinijeva Street (General Design IGH, 2011).

Figure 9 Road Solution – Version 1
City Port – East

Figure 10 Road Solution –Version 2
City Port – East

Source: General Design: External berths on the City Port breakwater – IGH (12/2011)

Figure 11 Road Solution – Version 3
City Port – East

Figure 12 Road network between the west and east shores – final version with the Marjan Tunnel

Source: General Design: External berths on the City Port breakwater – IGH (12/2011)

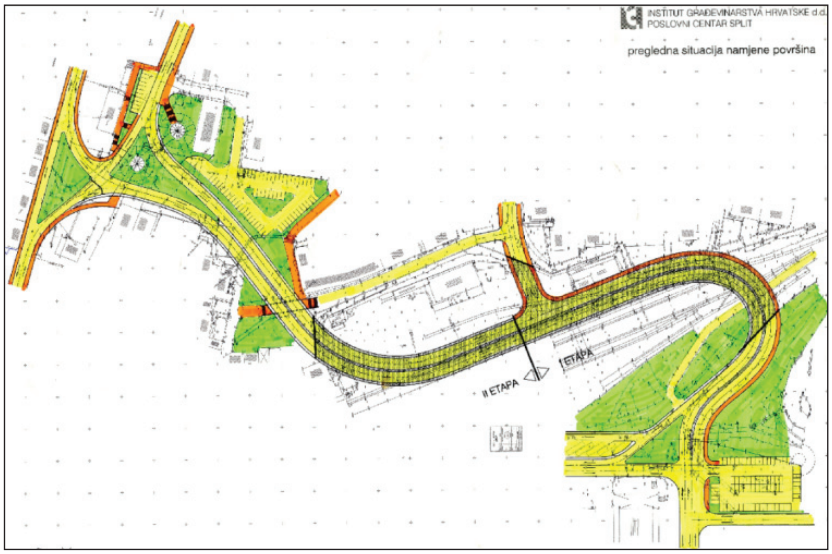

Figure 13 Detail of Version 3

Source: General Design: External berths on the City Port breakwater – IGH (12/2011)

An analysis of each of the proposed version together with the port, road and railway terminal in the east side of the City Port revealed that the solution presented in Figure 11 meets all criteria. The undersea tunnel that connects the east and west shores is integrated into all proposed versions. The position and appearance of the tunnel's portal at the Lazaretto location need to be designed in detail, taking into consideration protection requirements and the existing and planned municipal infrastructure.

Figure 14 illustrates the volume of traffic along a part of the road network in the broader area of the City Port, without the planned undersea tunnel.

Figure 14 Traffic volume on the part of the road network in the broader City Port area without the planned undersea tunnel

Source: General Design: External berths on the City Port breakwater – IGH (12/2011)

Figure 15 Traffic volume in the Marjan Tunnel in 2015 without the new undersea tunnel

Source: General Design: External berths on the City Port breakwater – IGH (12/2011)

Figure 15 shows the traffic volume through the Marjan Tunnel in 2015 without the new undersea tunnel.

Figures 16 and 17 clearly illustrate what will happen to the Split's street network when the undersea tunnel is operational. The traffic volume in the Marjan Tunnel will drop by more than 2,670 vehicles, while the new tunnel will absorb 13,388 vehicles. The volume of traffic will drop even lower on the roads parallel to the undersea tunnel clearly reducing total journey length and time. In addition to relieving the pressure on the Marjan Tunnel, the undersea tunnel will also bring about a change in the

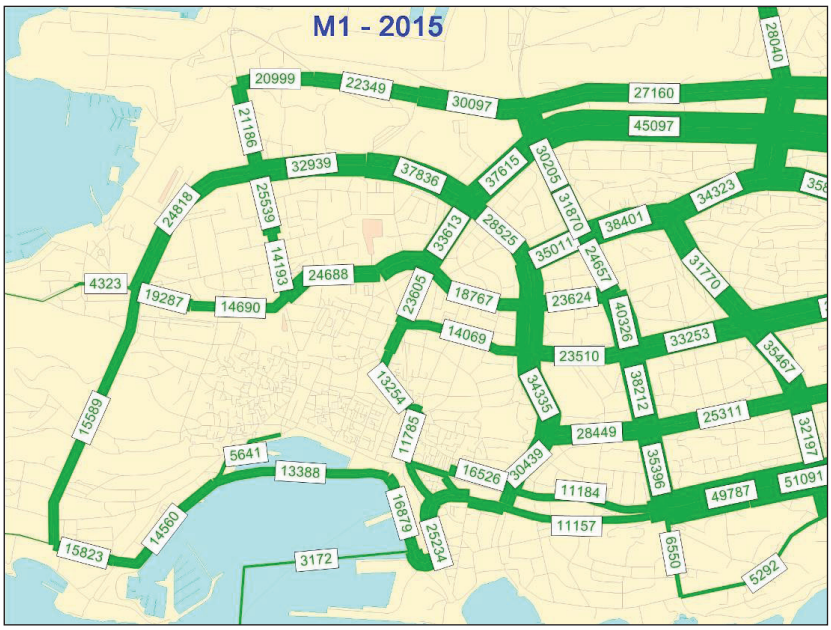

Figure 16 Traffic volume on part of the road network in the broader City Port area with the planned undersea tunnel

Source: General Design: External berths on the City Port breakwater – IGH (12/2011)

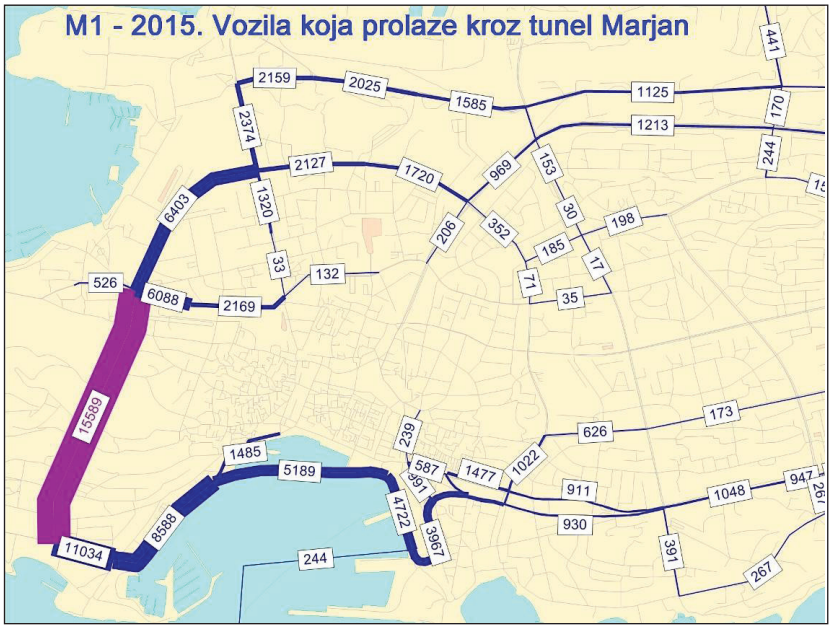

Figure 17 Traffic in the Marjan Tunnel in 2015 with the new undersea tunnel

Source: General Design: External berths on the City Port breakwater – IGH (12/2011)

traffic flows within the town, especially on roads that have been relieved of a part of the traffic that no longer flows through the Marjan Tunnel but instead goes through the new undersea tunnel to shorten the duration of travel.

5 RESEARCH RESULTS

The Split passenger port is located in the central zone of the town, in an area where all forms of mobile and stationary traffic (road, railway and maritime) collide and are assimilated. To find the optimal solution, all aspects of this problem must be considered and a solution put forward that is consistent with the economic guidelines of development. Having joined the European Union, Croatia will be eligible for EU infrastructure funding that should be used to boost regional development that takes environmental protection into consideration. Earlier problems connected to financing large and expensive problems are expected to disappear because well-designed projects would be financed through infrastructure funds.

The Split's passenger port is vital to maritime passenger transport, and it is the centre of passenger, cruise and excursion tourism. With the recent upgrading of the international terminal and the extension of the Sveti Petar Pier, the Port of Split has reached its final limits in terms of maritime transport. With the possible upgrading of the Sveti Nikola Pier and the construction of external berths to accommodate large cruise liners, the Port of Split would be able to operate at full capacity. By relocating international maritime transport to the North Port, international lines would be replaced with cruise and passengers ships, transforming the port into a passenger port. This would help to relieve the pressure on the town's road and vehicles from international traffic would not need to go far to join the motorway and trunk roads.

The City Port is connected to the broader surrounding area by maritime and road transport, as well as by other transport subsystems (railway, air and telecommunications) to form a single transport system. The Port of Split is important not only because of its connection with the Dalmatian islands but also because of its connection with Italy (Ancona and Pescara) which is vital for the tourist trade.

Every year, the rapid growth of tourism and the growing number of travellers and vehicles are the cause of heavy congestion in the confined area of the town core, which could result in the collapse of the town's entire transport system. Hence, businesses that are not engaged in maritime transport, tourism and hospitality should be relocated, and efforts should be fo-

cused on road infrastructure to improve road traffic and align it with modern demands and EU standards. The relocation of parts of the railway station and bus station would provide space that could be used for travellers and vehicles in transit to the islands and Italy, as well as for various other tourist services and facilities.

6 CONCLUSION

The significant growth of tourism and the need for a faster and better transport to destinations calls for new solutions for the traffic links between Split and the islands as major tourist destinations. Pursuant to the standards of the transport profession, this paper provides an insight into the existing state of transport and offers a future vision of how traffic will flow through the Split City Port to the Central Dalmatian islands, with the emphasis on ensuring unimpeded traffic along the roads accessing the Port of Split.

Modern living and changing trends in tourism are making it necessary to adapt and use an intermodal transport system. The EU's endeavour to connect the north and the south-east of Europe with a trans-European multi-modal transport system provides Croatia with opportunities to improve its maritime transport system as well as its transport system in general.

Joining the EU has also opened up new opportunities for realizing ideas through projects and provides a different way of financing these projects. There are promising prospects for using infrastructure funds, thus making it possible to realize challenging projects. However, the concern for the environment and sustainable development must not be neglected. The development of the transport system should foster sustainable development.

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