

D.4.1.2 Analysis on potential market flows of the Port of Ploče

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Autorità di Sistema Portuale
del Mare Adriatico Meridionale

Bari, Brindisi, Manfredonia, Barletta, Monopoli



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Introduction

This report presents the analysis on potential market flows of Port of Ploče. The report is carried out for the purpose of the elaboration of activities defined in the WP4 of the CHARGE project and it represents deliverable 4.1.2 - Analysis on potential market flows of involved ports. Report is based on potential market flows between port of Ploče and Italian ports, according to approved methodology in WP4 of the CHARGE project, collected data and through comprehensive research.

This report represents the analysis of port of Ploče itself, including its location, port facilities, processes, and current situation of the port. Also, the analysis of existing and potential market is also examined, evaluated, and presented, including projection of future traffic flows between Italian-Croatian ports. The report includes quantitative as well as qualitative description and explanation of the outputs.

The structure of this report includes parts as follows:

- Chapter 2: Methodology that was used to gather results, summarize and categorize them.
- Chapter 3: Assessment of port of Ploče, including road and rail infrastructure, port facilities, port processes and competition analysis.
- Chapter 4: Port traffic statistics, including freight and vessel traffic statistics
- Chapter 5: Overview and analysis of the existing traffic flows between Italian-Croatian ports.

- Chapter 6: Analysis on potential market flows and projection of future traffic flows between Italian-Croatian ports
- Chapter 7: Potential undesirable effects and points of congestion
- Chapter 8: Conclusion

1. Methodology

The overall objective of project CHARGE is to foster traffic flows and sustainable connection among the Adriatic ports involved, and to contribute to the competitiveness of territories served by the maritime links with a common approach while simultaneously increase the perceived value of shared intermodal solutions. CHARGE fosters the connectivity between the Adriatic regions and improves decision-making process coordination at CB level in maritime transport for joint strategies implementation and infrastructural investments, with specific attention to Adriatic Motorways of the Sea improvement between Italy and Croatia. CHARGE aims to upgrade intermodal services on the maritime links between the two shores of the Adriatic Sea to improve traffic flows efficiency and environmental sustainability and resolve critical bottlenecks.

The common approach should lead to the enhancement of Adriatic freight transport, taking into consideration the lessons learned within the 2007-2013 CARICA project. Within the project CHARGE a common methodology for potential traffic flow analysis will be used by all partners for the analysis and definition of the respective outputs. On base of this methodology each partner should perform the analysis for the area of its responsibility, and develop the individual report based on same criteria. The methodology should include a common index for the final analysis of each partner and it should be approved by all partners. Also, the methodology should generate strategic report on future scenarios of traffic flows between IT-HR ports in line with the EUSAIR action plan.

CHARGE project activity 4.1 Joint market analysis to assess traffic potential market between Adriatic Ports includes the following segments:

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- Elaborating and proposing the common methodology for potential traffic flow analysis for the collection and elaboration of ferry and containers traffic data including areas of origins and destinations of the traffic and typology of the freight.
- Analysis on potential market flows of involved ports, where each involved port collects data and elaborates the analysis based on the agreed methodology.

Comprehensive report on the future scenarios of traffic flows between Italian-Croatian ports with the creation of the strategic document highlighting the potential developments of traffic flows between Italian and Croatian ports in line with the reports for each partner and EUSAIR action plan.

- Methods to be used for the traffic flow analysis are:
- Method of compilation: researchers can use scientific papers and studies, predictions, and recommendations.
- Method of description: in order to define the main characteristics of the port and port area, sailing routes, intermodal (maritime, road, railway) infrastructure and operation.
- Method of comparison: in order to make certain conclusions and estimations.
- Statistical method: to give insights in certain operation and facts through the interpretation of statistical data.
- Inductive method: In order to give certain conclusions from the given facts, figures and predictions.
- Field research analysis, if applicable.

The statistical data for this report can be acquired from many sources, including, but not limited to:

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- Official statistical sources such as countries Bureau of statistic and Eurostat;
- Official business reports and Annual reports from analysed ports, motorways and railways companies, and other stakeholders; - Scientific papers and articles.

This methodology should include several chapters:

- Introduction.
- Defining the main characteristics of the port and port area.
- Port traffic statistics; o Freight traffic statistics; o Vessel traffic statistics.
- Other related data.
- Overview and analysis of the existing traffic flows between Italian-Croatian ports.
- Analysis on potential market flows and projection of future traffic flows between Italian-Croatian ports.
- Potential undesirable effects and points of congestion; - Conclusion.

2. Characteristics of the port and port area

The Port of Ploče is situated at the Central Adriatic coastline, approximately 100 km South-East from the city of Split and 100 km North-West from Dubrovnik. The port's central-Adriatic location, as well as its position in the south of Croatia (HR) leads to an international hinterland, covering the Dalmatian coastline, as well as Bosnia and Herzegovina (BH), Serbia (SR), Montenegro (MNE) and Hungary (HU).

Through a 24 km railway line and road, the port is linked with its immediate hinterland of BH and further to the North-East of Croatia and Central Europe. Further, it is the end/starting point of the Corridor Vc (Budapest-Osijek-Sarajevo-Ploče). Through the Adriatic Highway (as part of the European route E65), it is connected to the Northern cities of Split, Rijeka and Trieste, and to Montenegro in the South.

The Pelješac peninsula to the South and West of the port provides for a natural breakwater. Equally important is the connection to Corridor X via Corridor Vc, connecting the Port of Ploče also with Serbia to the East and even Austria to the North-West.

The Port of Ploče is also connected to international inland waterways. They are the Sava River from Sisak to Belgrade and the Danube River, constituting pan-European transport Corridor VII. Through the latter, a connection to other European inland waterways, such as the Rhine is possible via the Rhine-Main-Danube Canal.

The nearest international airports are located in Mostar (70km), Dubrovnik (120 km) and Split (120 km).

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The port is an EU port and open to domestic and international traffic.

Other ports in the eastern Adriatic region and with similar catchment areas, in particular BH and landlocked SR, and therefore potential competitors are:

- Port of Durres (Albania),
- Port of Bar (Montenegro),
- Port of Rijeka (Croatia),
- Port of Koper (Slovenia).

Outside the Adriatic regions, the Greek and Black sea ports can also be considered competitors when it comes to markets of the land-locked Serbia and Macedonia.

An integral part of the Port of Ploče is the Port of Metković. Situated 25 km upstream on the banks of river Neretva in the town of Metković, situated along the BH-HR border. The terminal disposes of a connections to the rail and road systems and provides facilities for the transshipment of cement (silo), cinder and granulated stone.

The following figure gives a schematic overview of the location of the port along the Adriatic coast and a more detailed view of the location of the port facilities and the major transport connections.

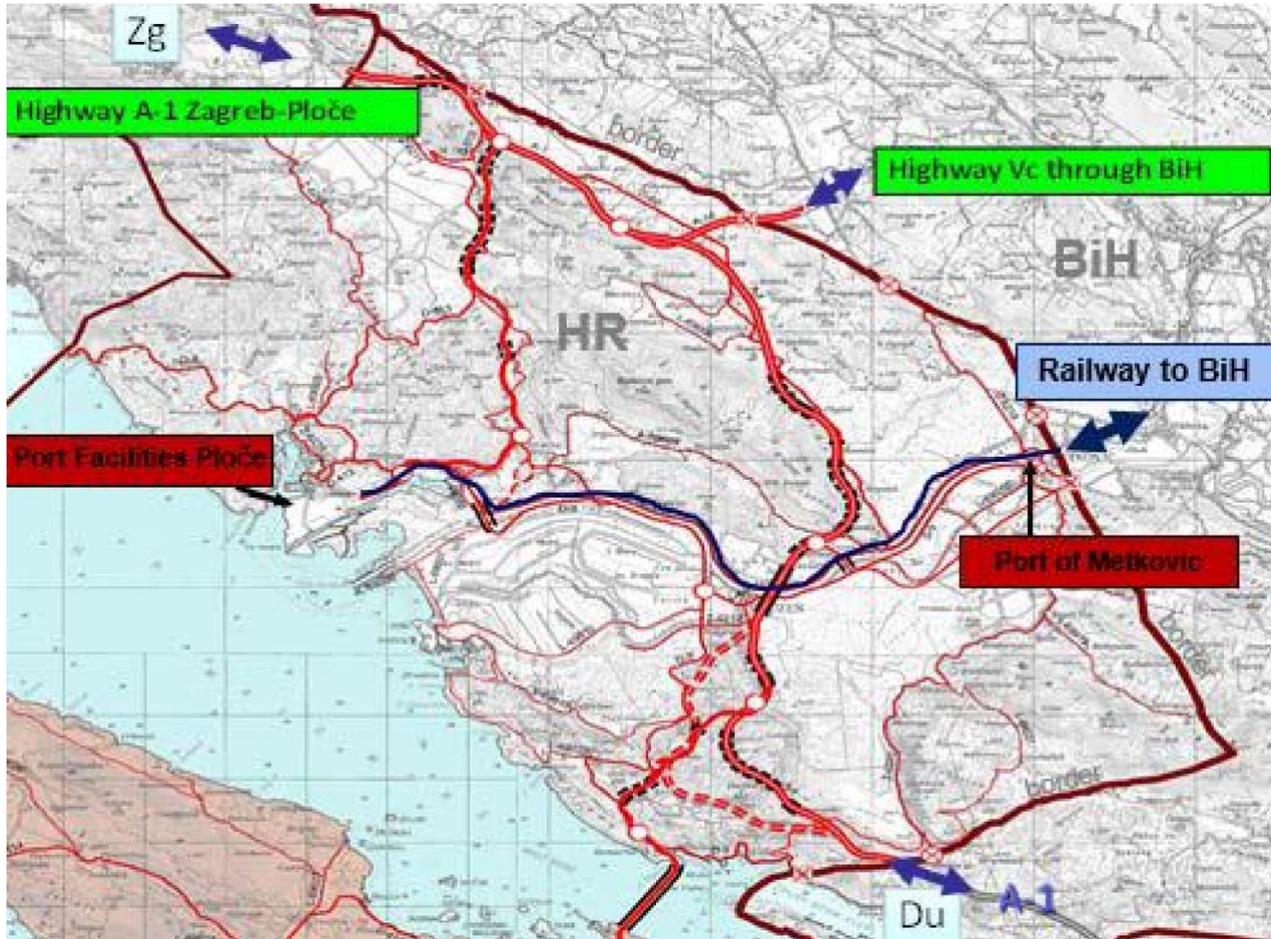


Figure 1 - Location of the Port and major rail and road connections

Port of Ploče is geographically the biggest cargo port and the second largest cargo port in Croatia in total throughput volume, after Rijeka, and it is a classical landlord port. The capacity of the port is presently estimated to be at approximately 10 million tons per anno for dry bulk and general cargo and amounts to 1.2 million tons for liquid bulk.

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The following table gives an overview on the general capacities of the port.

Area (land part)	2.559.732,00 m ²
Area (sea part)	1.406.430,00 m ²
Area of external anchorage	23.000.000,00 m ²
Open storage area	315.000,00 m ²
Sheltered storage area	10.000,00 m ²
Indoor storage area	55.000,00 m ²
Total number of quays	8
Length of quays	2100 m
Depth	5-17,2 m
Length of rail within port area	19.944,00 m
Length of crane tracks	1.545,00 m

Table 1 - General capacities of the port

The major concessionaire is Luka Ploče JSC, who operates several facilities for embarkment/dismemberment and storage of various types of cargo located on eight shores with a draught of up to 16,5m. These are:

General cargo terminal:

- Quay with a length of 705 m and a draught of 9.2 m, - Warehouses with an area of about 300,000 m², - Equipped with:
 - 8 shore cranes,

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- 9 auto cranes with capacity of 15-60 tons,
- 100 fork lifters with a capacity of 2-28 tons,
- 16 electric fork lifters of a capacity of 1,2-2,5 tons,
- Railway tracks with a length of 5,600 m.

Dry bulk cargo terminal:

- Quay with a length of 510m and a draught of 13,5 m,
 - Storage capacity of 2,2 million tons,
 - Mooring possible for ships of up to 70.000 DWT,
 - Reloading capacity 10.000 tons/ day, - Equipment with:
 - 5 cranes
 - 1 mobile crane with a capacity of 63 tons,
 - 1 mobile crane with a capacity of 140 tons.

Alumina and petrol coke terminal:

- Quay with a length of 180m and a draught of 9,8m,
- Alumina silo with a storage capacity of 20,000 tons,
- Petrol coke storage of 10,000 tons.

Timber transit terminal:

- Quay with a length of 110m,
- Covered warehouse of 2000 m²,
- Open storage area of 153,925 m²,

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- Equipped with 10 fork lifters.

Two liquid cargo terminals:

- Storage capacity of 220,000 tons in total separated for different kinds of liquid bulk.
- Cold store and other phytosanitary equipment

New container terminal

- Quay with length of 260 m and draught of 13,0 m,
- Warehouse area of about 40.000 m², - Equipped with:
 - 1 STS crane,
 - 1 mobile crane with capacity of 63 tons,
 - 1 mobile crane with capacity of 140 tons,
 - 6 container stackers.

New dry bulk cargo terminal

- Quay with length of 373 m and draught of 17,2 m,
- Storage capacity of 6,2 million tons,
- Mooring possible for ships of up to 120.000 DWT,
- Reloading capacity 25.000 tons/ day, - Equipment with:
 - Ship unloader,
 - dozers,
 - stacker/reclaimers,
 - hoppers,

- 1 mobile crane with a capacity of 63 tons,
- 1 mobile crane with a capacity of 140 tons.

The following figure gives an overview of the port, the concessionaires and sub concessionaires and the facilities operated by them.

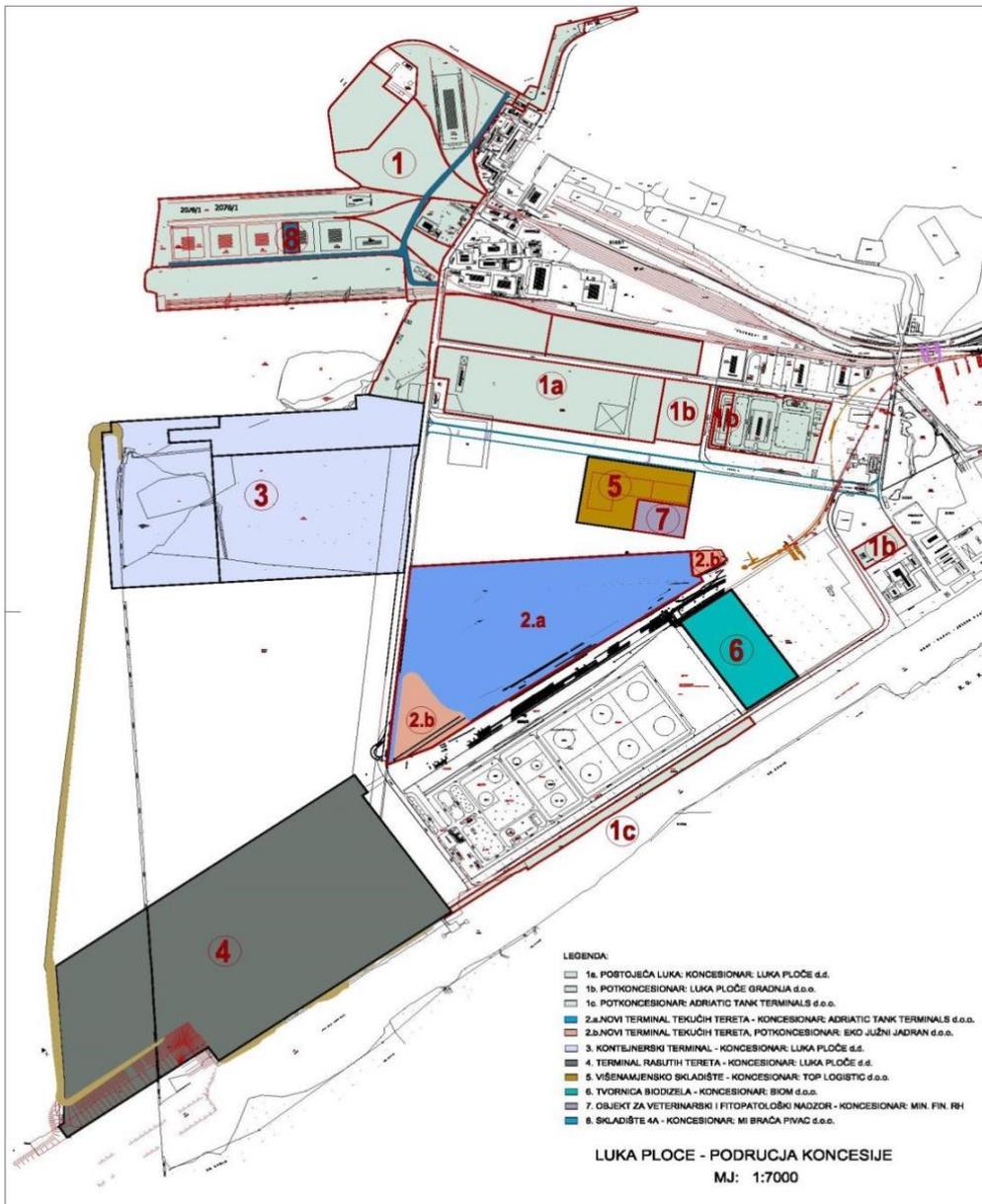


Figure 2 - Plan of the port, port concessionaires and sub-concessionaires

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The Port of Ploče geographical location leads to the fact that it has a rather small immediate inland catchment area along the Dalmatian Coastline. It is only connected to the larger northern regions of Slavonia and Croatia properly via Bosnia and Herzegovina or lengthy detours. Thus, the international hinterland is of an even greater importance with Bosnia and Herzegovina, Serbia, Montenegro, Hungary, Slovakia and Slovenia. The hinterland countries are only to a small extend congruent with the markets. The Port of Ploče is currently active in BH, HR and MNE. To a bigger extent, they constitute the potential catchment area.



Figure 3 - Port of Ploče's hinterland

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While not even 1% of the goods leaving the port are directed towards the southern neighbouring state of Montenegro (MNE) and roughly 8% are distributed directly to the Croatian surroundings (HR), 91% of the goods are heading towards BH.

This is not to say that BH constitutes the final destination of these goods in their entirety. However, it underlines the importance of the transport route along Corridor Vc through BH. Since exact numbers on the final destinations of goods leaving the port are not available, a comparison with the ports of similar catchment/destination areas and thus posing as competitors to the Port of Ploče seems to be wise – always keeping in mind the slightly different geographical positions. Looking at the destinations of goods handled by the Port of Rijeka for example, it becomes clear that of the 70% of the total throughput of Rijeka nearly all goes to Hungary and Slovakia, countries of destination which the Port of Ploče can claim to be its hinterland as well.

Competing sea ports are ports located on the Eastern Adriatic coast: Rijeka (Croatia), Koper (Slovenia), to some extent Bar (Montenegro) and Durres (Albania) and, to an even lesser extent, Trieste (Italy). Even Constanta (Romania) and the North Sea ports can be considered to be a competitor for the potential HU and Slovakian markets. On top of that are the Greek ports operating regular trains with the landlocked countries of Serbia and Hungary.



Figure 4 – Competitive situation for the Port of Ploče

With regard to the potential catchment area of Hungary and Slovakia and the Region of Northern Croatia, port of Ploče can be considered to be in direct competition with Rijeka, Koper, Trieste and the North-Sea ports and to an extent – especially concerning the Serbian market – with Bar. In fact, the north-Sea ports catch the majority of goods from Hungary and Slovakia although the distance to the ports is double and sometimes treble to the Adriatic ports. Transports to the Black-Sea ports is also competitive. Serbia, Macedonia and Kosovo also use the Greek ports.

A distinctive characteristic of the Port of Ploče is the importance of BH as its direct hinterland, an area which is – up to now - not served to the same extent by Koper or Rijeka. The Port of Koper

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is main competitor to Ploče in terms of transshipment cargo, but has no significant volumes for BH, at least, not yet. But the port of Rijeka is increasing its transports with BH by road.

The Port of Ploče does not possess the infrastructure to handle large container vessels because of the size of quay wall and draught. Rijeka, Koper and Trieste do offer this possibility.

The Port of Ploče is restricted in its competitive force due to the fact that it can only handle smaller vessels and finds itself in the same “league” as Bar and Durres.

The competing ports all face development constraints in terms of bulk cargo. More specifically, the Port of Bar is hampered by a mountainous hinterland raising the cost of its rail and road connection, whereas Rijeka’s bulk terminal is facing capacity constraints.

Comparing Ploče with the competing ports, Koper and Rijeka have not suffered such a severe decline in cargo throughput in the past years indicating that they are not as vulnerable to market changes as Ploče. In terms of container traffic, it can be observed that both Rijeka and Koper have recovered after the 2009 crisis, and the growing traffic trends through Koper and Rijeka indicate a strong demand for Adriatic ports.

Even though the Port of Ploče serves a slightly different market, it seems that Ploče has not been able to use the new terminal and improved facilities to attract new container lines, and to expand its reach beyond the BH market. The situation is similar in terms of bulk cargo. Even though it should be noted that Ploče lost bulk traffic has not been reallocated to other ports, although it is primarily a result of changed business environment of port’s main clients. Ploče has not yet succeeded to replace the lost customer by a new one and should aim to expand its client base beyond the current BiH market.

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3. Port traffic statistics

The port primarily serves three market segments: (i) container traffic, whose evolution is based on macroeconomic situation in BH and Croatia; (ii) bulk traffic, driven by the production of main clients in BH, dependent on the global demand for steel, coke and aluminium; and (iii) liquid cargo, driven by economic growth in BH.

The port has had a continuous growth in cargo throughput until 2008; it was a record year for the port, with a total of 5.1 million tons handled. However, since 2009, the port has faced two major setbacks. First of all, the global economic crisis has had a severe impact on the metal industry in BH, consequently impacting the production and cargo traffic of the port's main clients. Cargo throughput fell by 44 percent in 2009 (to 2.9 MT), and has managed to partially recover in 2010 and 2011. Secondly, the loss of a major client in 2012 (coal transshipment to power plants in Brindisi, Italia) was another major shock for the port. It decreased the overall volumes by 1.4 MT annually, but also significantly narrowed the client base. The total throughput in 2012 amounted to 2.6 MT, which is below the 2005 level and it has still not recovered until 2014. In 2015, the throughput was 2.9 MT, and in 2017 and 2018 the throughput is at 3.2 MT. Since the metal industry in BH is still operating below its capacities, and the port is facing difficulties in attracting new clients, the current situation and future prospects present a major concern.

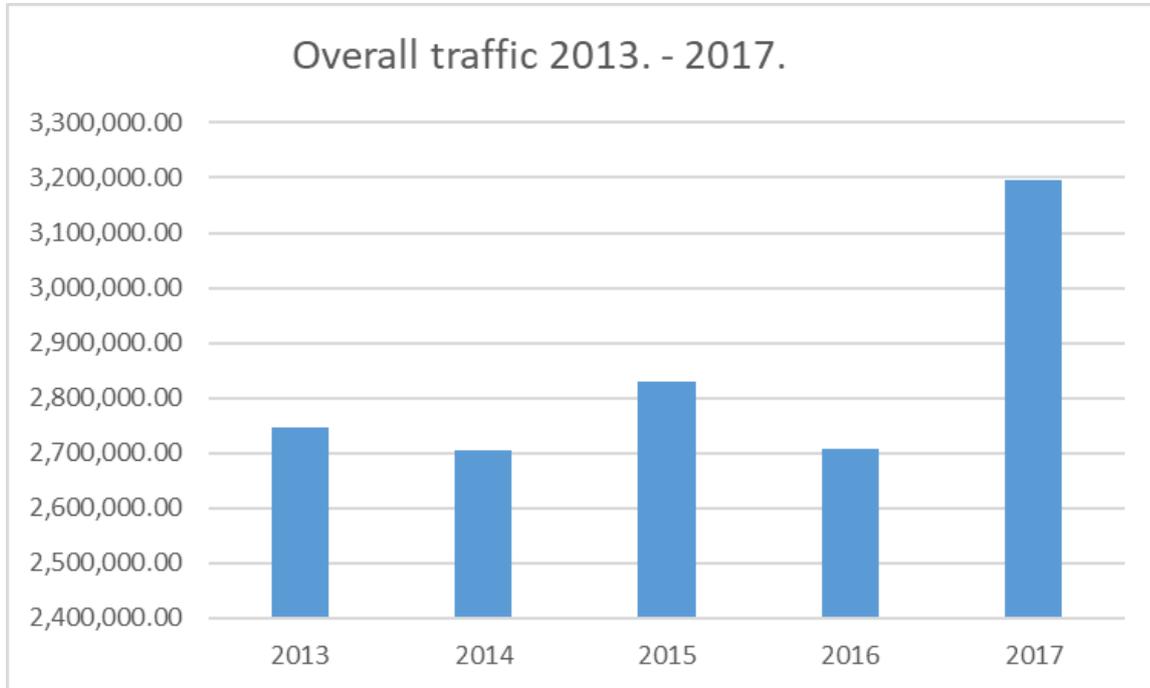


Figure 5 - Cargo Throughput in the Port of Ploče 2013-2017

Due to its location, the Port of Ploče is of major importance for the economy of the neighbouring country BH. According to studies on empty containers, 70% of BH sea freight imports go via the Port of Ploče. The port management, freight forwarding companies and shipping agencies, have also confirmed this figure. Container transport with BH amounts to 22,500 TEU per anno, accounting for 80% of the total container throughput of the Port of Ploče (28,000 TEU per anno). The following chart underlines the increasing importance of BH for the Port of Ploče. At the same time, it shows the dangerous dependence of the Port of Ploče on the BH market.

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Year	General	Bulk	Liquid	Overall	TEU
2013	515,168.36	1,829,691.64	401,375.87	2,746,235.87	18,752
2014	527,239.86	1,838,346.14	338,140.94	2,703,726.94	16,948
2015	503,028.91	1,863,114.26	464,508.81	2,830,651.98	20,764
2016	441,585.33	1,697,234.41	567,602.65	2,706,422.39	21,161
2017	417,583.40	1,973,160.43	804,219.49	3,194,963.32	24,307

Table 2 – Overall cargo throughput in the Port of Ploče 2013-2017

When analysing the freight volumes leaving the Port of Ploče by the means of transport, it can be stated that the number freight transports by rail has again risen over the last years to up to 80%. This underlines the importance of rail-related actions.

3.1 Freight traffic statistics

a) Container traffic

In the period of 2013-2017, port of Ploče had a growth of container traffic at a rate of 28,9%, passing from 18.713 TEUs in 2013. to 24.121 TEUs in 2017. Most of the growth was international traffic, mostly for Bosnia and Herzegovina.

2013					
Containers		TEUs			Container ships
Loaded	6672	Loaded	9365		

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Discharged	6761	Discharged	9348		
Total	13433	Total	18713	Total	98

2014						
Containers		TEUs			Container ships	
Loaded	5965	Loaded	8429			
Discharged	5934	Discharged	8430			
Total	11899	Total	16859	Total	94	

2015						
Containers		TEUs			Container ships	
Loaded	7214	Loaded	10343			
Discharged	7248	Discharged	10333			
Total	14462	Total	20676	Total	94	

2016						
Containers		TEUs			Container ships	
Loaded	7406	Loaded	10365			
Discharged	7589	Discharged	10600			

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Total	14995	Total	20965	Total	92
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2017					
Containers		TEUs		Container ships	
Loaded	8074	Loaded	11792		
Discharged	8387	Discharged	12329		
Total	16461	Total	24121	Total	92

Table 3 – Container cargo throughput in the Port of Ploče 2013-2017

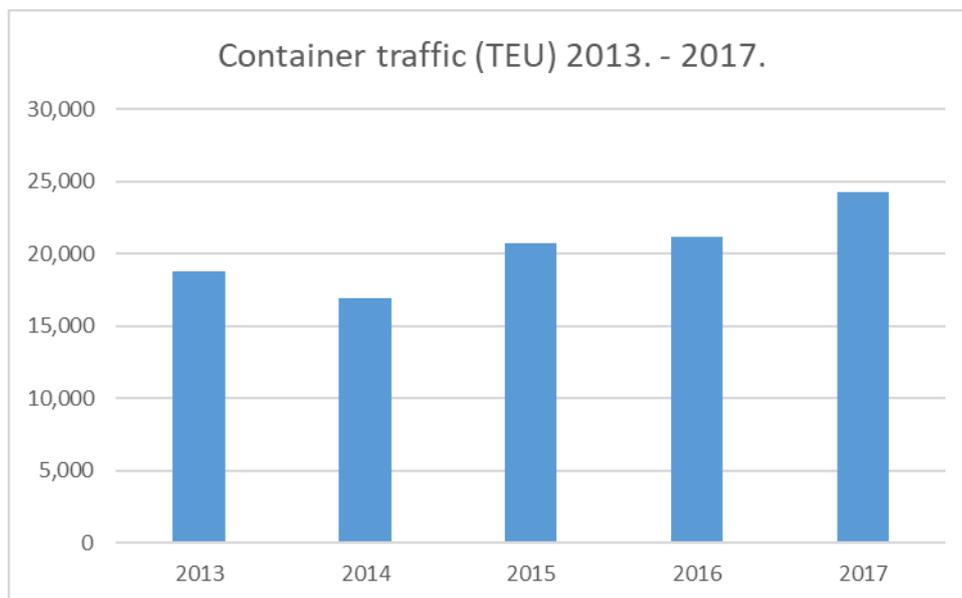


Figure 6 – Container cargo throughput in the Port of Ploče 2013-2017

b) General cargo traffic

In the period of 2013-2017, port of Ploče had a slight decline of general cargo traffic because of the strong decline of steel and aluminium products. Although there was significant increase of bagged and containerized cargo, it was not enough to annul the decrease caused by mentioned decline.

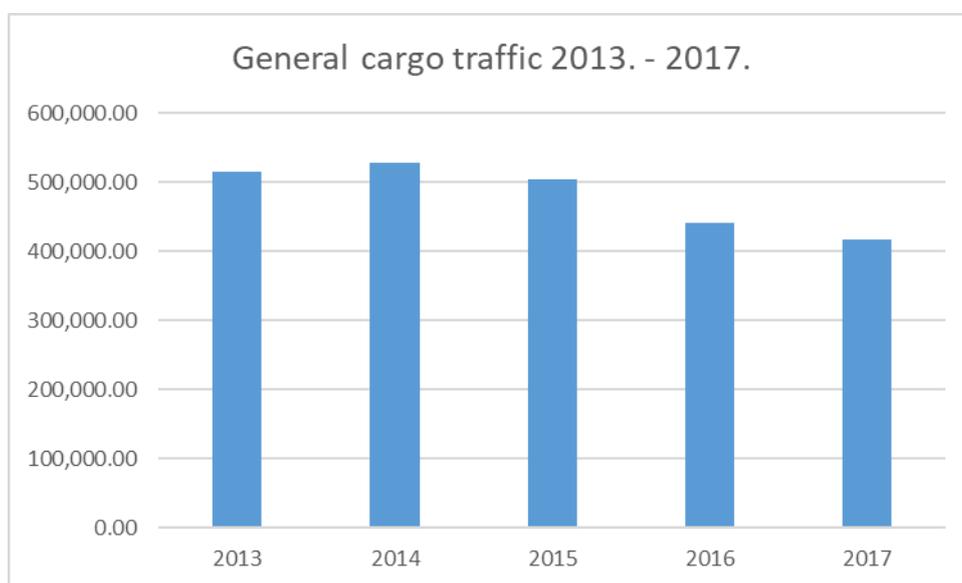


Figure 7 – General cargo throughput in the Port of Ploče 2013-2017

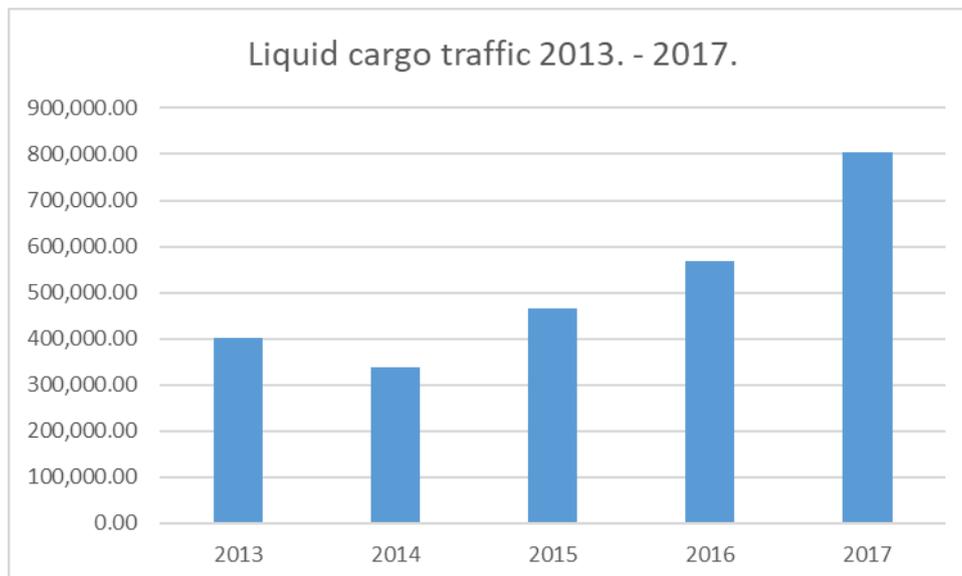
GENERAL CARGO	2013	2014	2015	2016	2017
wood products	18,323.00	28,374.00	29,211.00	30,917.00	12,904.00
aluminium products	76,745.00	57,517.00	24,169.00	4,427.00	12,987.00
steel products	178,075.00	193,421.00	158,134.00	97,608.00	35,493.00

bagged cargo	35,269.00	70,006.00	46,766.00	68,022.00	79,673.00
containerized cargo	195,805.00	173,064.00	236,374.00	234,512.00	259,676.00
other general cargo	10,951.00	4,857.00	8,374.00	6,099.00	16,850.00
overall (tons):	515,168.00	527,239.00	503,028.00	441,585.00	417,583.00

Table 4 – General cargo throughput in the Port of Ploče 2013-2017

c) Liquid cargo traffic

In the period of 2013-2017, port of Ploče had a strong increase of liquid cargo traffic because in 2016. the new concessionaire for storage of liquid cargo (ATT) has built whole liquid cargo terminal with increased capacities, which has reflected on port's traffic numbers that have doubled in the projected period. Almost all of liquid cargo traffic refers to refined oil products.



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Figure 7 – Liquid cargo throughput in the Port of Ploče 2013-2017

LIQUID CARGO	2013	2014	2015	2016	2017
refined products	365,771.00	331,840.00	459,382.00	567,602.00	804,219.00
other liquid bulk	35,604.00	6,300.00	5,126.00	0.00	0.00
overall (tons):	401,375.00	338,140.00	464,508.00	567,602.00	804,219.00

Table 5 – Liquid cargo throughput in the Port of Ploče 2013-2017

d. Bulk cargo traffic

In the projected period, bulk cargo traffic had a slight (8%) increase, mainly due to increase of coal traffic, which has increased for 22%.

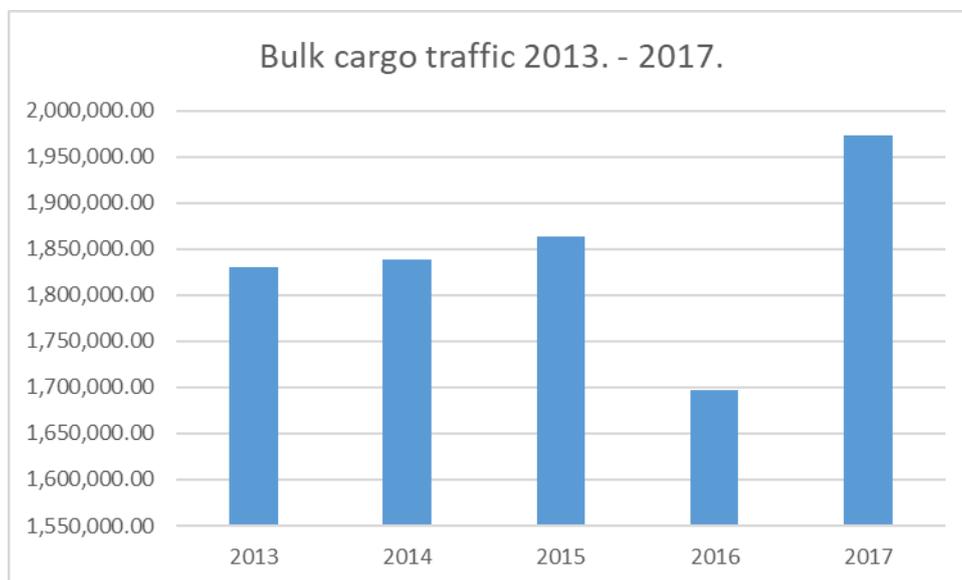


Figure 8 – Bulk cargo throughput in the Port of Ploče 2013-2017

DRY BULK CARGO	2013	2014	2015	2016	2017
alumina	219,903.00	186,890.00	155,491.00	182,582.00	181,378.00
coal	1,072,484.00	1,257,721.00	1,368,281.00	1,145,124.00	1,305,435.00
coke/pet-coke	234,595.00	138,896.00	50,762.00	47,510.00	163,330.00
scrap metal	73,962.00	74,112.00	32,871.00	33,205.00	99,097.00
sand	8,990.00	19,810.00	20,853.00	15,890.00	4,200.00
foodstuff/cereals	196,111.00	75,347.00	159,765.00	189,568.00	117,388.00
other dry bulk cargo	23,646.00	85,570.00	75,091.00	83,355.00	102,332.00

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overall (tons):	1,829,691.00	1,838,346.00	1,863,114.00	1,697,234.00	1,973,160.00
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Table 6 – Liquid cargo throughput in the Port of Ploče 2013-2017

e) Passenger traffic

In the projected period, there was a significant (55%) increase of passenger traffic. Since port of Ploče is predominately a cargo port, whole passenger traffic comes from a single ferry line that connects Ploče with Pelješac peninsula (ferry line Ploče – Trpanj). With the ongoing construction of Pelješac bridge, it is projected that these numbers will decrease.

Small cruiser ships sometimes call in port of Ploče, but the number of passengers is irrelevant (less than 1 thousand per year).

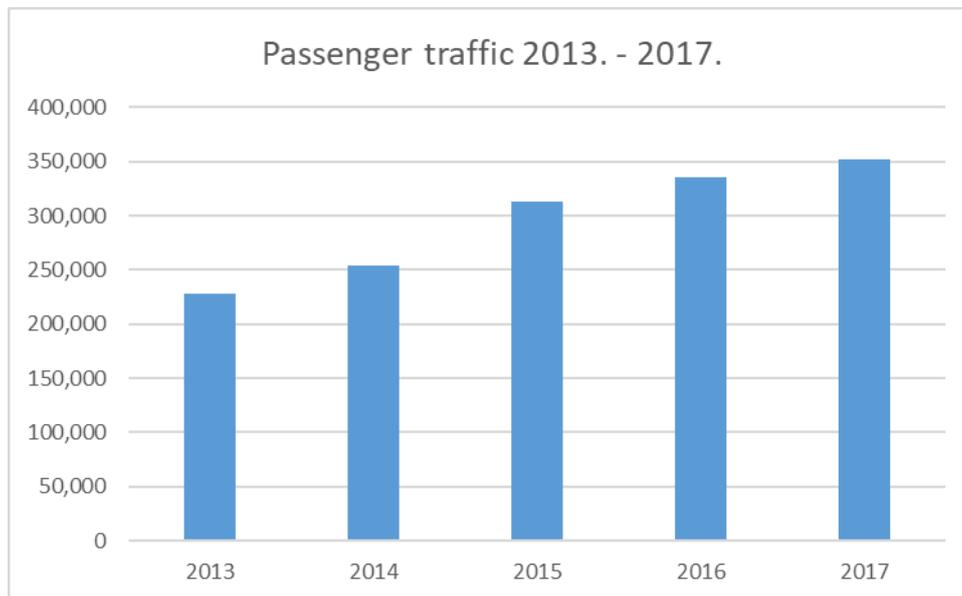


Figure 9 – Passenger traffic in the Port of Ploče 2013-2017

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3.2 Vessel traffic statistics

	2013	2014	2015	2016	2017
Vessels overall	423	382	379	366	419
Container vessels	98	94	95	92	92
General cargo vessels	111	110	88	81	66
Dry bulk vessels	125	114	108	94	143
Liquid cargo vessels	89	64	88	99	118

Table 7 – Vessel traffic statistics in the Port of Ploče 2013-2017

Unfortunately, regarding vessel traffic statistics, there is no more detailed data currently available.

3.3 Other related data

VTS centre is operational 24/7, every day in year, and referring to it is mandatory for all vessels of 500 GT and above entering the VTS area in transit, anchoring in the roads, or heading to (or departing from) the port of Ploče.

VTS centre provides:

a) information services:

- traffic (ship positions, names and routes);
- weather (meteorological and hydrological conditions, warnings);
- general information (procedures, radio frequencies, buoy or light failures, SAR or decontamination operations, floating objects that might be a threat to navigation)

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a) traffic organization services:

- in case of relevant traffic.
- in presence of vessels that could affect the safe passage of other vessels (like ships restricted in their ability to manoeuvre or carrying dangerous goods).

b) navigational assistance service:

- advice in case of heavy weather or of an engine/system failure on board.

The languages to be used within the VTS area are Italian and Croatian, and reports to VTS concern:

- first contact (no less than 5 NM off the outer VTS area);
- entry (entering the VTS area);
- anchorage report (actual timetable of the anchor lowering and heaving up);
- pilot report (when the pilot has boarded and/or disembarked);
- berthing/unberthing report (vessels, on entering/departing from port of Ploče);
- exit report (on leaving the VTS Area);
- accident report.

4. Overview and analysis of the existing traffic flows between traffic flows between Italian-Croatian ports

In 2016, there were 135 cargo vessels that sailed between Ploče and Italy, 63 that sailed from Italy to Ploče and 72 that sailed from Ploče to Italy. Most of those vessels were general cargo vessels (feeder container ships). Other significant connections were dry bulk vessels, mostly because of transshipment of dry bulk cargo like coal.

2016				
	Italy - Ploče		Ploče - Italy	
	vessels	cargo (t)	vessels	cargo (t)
liquid cargo	3	43932	4	55773
dry bulk cargo	20	119840	15	122822
general cargo	40	115091	53	203531
total	63	278863	72	382126

Table 8 – Traffic flows between Port of Ploče and Italy in 2016

In 2017, there were 162 cargo vessels that sailed between Ploče and Italy, 95 that sailed from Italy to Ploče and 67 that sailed from Ploče to Italy.

2017				
	Italy - Ploče		Ploče - Italy	
	vessels	cargo (t)	vessels	cargo (t)
liquid cargo	24	214125	7	29295
dry bulk cargo	29	169300	1	4437
general cargo	42	98600	59	179567
total	95	482025	67	213299

Table 9 – Traffic flows between Port of Ploče and Italy in 2017

As for as passenger traffic is concerned, there were no traffic flows between port of Ploče and Italy, although in 2018. there is a new pilot line established between Ploče and Termoli, Italy, which could generate some passenger traffic (although not substantial).

5. Analysis on potential market flows and projection of future traffic flows between Italian-Croatian ports

As a logistic node, port of Ploče is situated on the eastern coast of the Adriatic Sea and because of its location it is of great importance for the economy of the neighbouring Bosnia and Herzegovina, whose state border is only 25 km from the port of Ploče.

It is located in the bay that encloses the Pelješac peninsula on the south and southwest sides, thus representing a natural breakwater. Luka Ploče is directly connected with its hinterland in Bosnia and Herzegovina, further to the north-eastern part of Croatia, and with Central Europe the railway line and the roadway (E-73) stretching along the line C (Budapest - Osijek - Sarajevo-Ploče) Of the Fifth Pan-European Corridor (Venice - Trieste - Budapest - Uzgorod - Lvov). This roadway is also one of the most important branches of the TEM / TER project and in a broader sense connects the European North (Baltic) with the Adriatic and is of vital importance in economic connections and the traffic of people and goods.

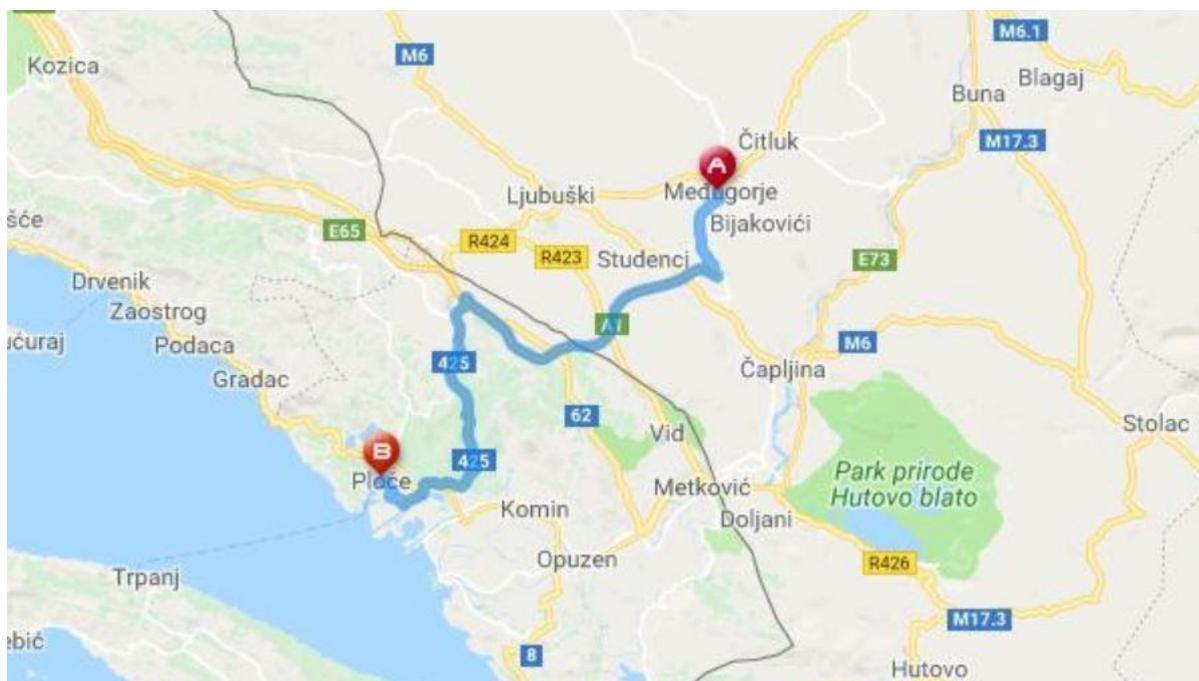


Figure 10 – Connection between Ploče and Međugorje, B&H

Since Međugorje, Bosnia and Herzegovina, a major destination for Italian tourists, is located only 40 km from port of Ploče, we should focus on this market. According to statistical data from B&H, there was 1 million of tourists in Međugorje in 2017., and almost all of them arrived via road, with Italian tourists being the vast majority.

This situation was closely monitored, and a result is a permanent catamaran line between Ploče and Termoli, Italy, which should be established to provide fast connection between central and southern Italy and Međugorje.



Figure 11 – Connection between Ploče and Termoli, Italy

The line should be operated by a 36-meter-long catamaran, with capacity of 330 passengers, with projected duration of voyage at 4 hours and 45 minutes, meaning that transit time from Termoli to Ploče is decreased by almost 10 hours.

Since there is an existing ferry line between Split and Ancona, it is not likely that another ferry line between Ploče and central Italy will be established so we will not consider this possibility.

6. Potential undesirable effects and points of congestion

It could be said that for the current cargo flow, Port of Ploče has satisfactory infrastructure. The problem with congestion on the road can be seen only in summer months with the influx of tourist. However, since city of Ploče is not a great touristic destination, congestion is not a major problem in city itself, but it can be a major problem on the motorway A1 and the surrounding roads and border crossings.



D.4.1.2 Analysis on potential market flows of the Port of Ploče

Figure 12 – Congestion on motorway A1 near port of Ploče

Port of Ploče has a connection to a highway A1 that is connecting capital with the south of the country. It is also part of the corridor Vc that stretches from Budapest and includes the road connection from Hungarian border through Osijek, Sarajevo and Mostar to Metković and Ploče (road E65). The road connection is very good, and with the building of new entrance terminal, there is a direct access from main port gate to highway.

The problem with congestion mostly manifested at state border with Bosnia and Herzegovina, since Port of Ploče is major transit port for Bosnia and Herzegovina. Picture below shows main border crossings in that area:



Figure 13 – Border crossings near port of Ploče

D.4.1.2 Analysis on potential market flows of the Port of Ploče

It could be said that port of Ploče has a good infrastructure, especially if we took into consideration soon to be new entrance terminal, that will be directly connected with highway network. Railway infrastructure is also in good condition in the port, and the only problem is the connection and cooperation between two countries – Croatia and Bosnia and Herzegovina. The main problem that port of Ploče now consider is lack of information exchange. At the moment, there is still paper information exchange between actors. Also, main problem is information exchange from the sea side – between ships and port. Because of that problem, in the last few years, there were few accidents where ships made a collision with the terminal and made a huge damage to the operation of the port. Because of that, main focus of the port should be in informatization of operations and information exchange.

7. Conclusion

Port of Ploče is one of biggest Croatian ports. It is located near the mouth of the Neretva river on the Adriatic Sea coast. As of 2018, it ranked as the second largest cargo port in Croatia — after the Port of Rijeka — with a cargo throughput of 3.3 million tons, consisting mostly of liquid and dry bulk cargo. Based on the analysis it is determined that almost all parameters within road network meet ports requirements.

After the new entrance terminal has been built, the flow capacity of cargo traffic meets all requirements and can be evaluated as extremely good. With direct access to highway, port of Ploče is able to attract more cargo in transit.

Although existing cargo traffic flows between port of Ploče and Italy are significant, there are big possibilities for improvement of passenger traffic flows. The main opportunity is to establish a permanent direct fast line between Termoli and Ploče, which can be tenable because of more than 500 thousand tourists visiting Međugorje from Italy every year. Decreasing transit time from 14 hours to 4 hours and 45 minutes and decreasing costs of travel could provide that a direct fast line between Termoli and Ploče becomes permanent.

Cargo traffic flows between port of Ploče and Italy can also be improved and increased without possibility of congestion, especially since new container, dry bulk and entrance terminals have been built within the port.

As for the possible undesirable effects of developing new traffic, no possible congestion is expected.