D.3.2.3-4 Analysis of the physical and non-physical bottlenecks in Italy and Croatia

Document Control Sheet

Project number:	10041221
Project acronym	CHARGE
Project Title	Capitalization and Harmonization of the Adriatic Region Gate of Europe
Start of the project	January 2018
Duration	18 months

Related activity:	3.2 - Identification of main physical and nonphysical bottlenecks in the Adriatic area
Deliverable name:	Analysis of the physical and non-physical bottlenecks in Italy and Croatia
Type of deliverable	Report
Language	English
Work Package Title	Elimination or Reduction of Bottlenecks through the Harmonization of Data
Work Package number	3
Work Package Leader	KIP – Intermodal Transport Cluster

Status	FINAL
Author (s)	ADSPMAC
Version	1
Due date of deliverable	31.10.2018.
Delivery date	31.07.2019

Content

Introduction

This document is part of WP3 ”Elimination or reduction of Bottlenecks through the Harmonization of Data” of the project CHARGE (Capitalization and Harmonization of the Adriatic Region Gate of Europe) which capitalizes the collected results of IPA CBC Programme 2007-2013 CARICA project and other projects like ADRIATICMOS, INTERMODADRIA and EASYCONNECTING from IPA and ADB Multiplatform from South-East Europe having the objective the development of freight transports in the Adriatic area and connectivity to the other EU member states.

The main objectives of WP3 are the identification of new physical and non-physical bottlenecks in the Adriatic area as an improvement, and pursuance of the CARICA activity by updating of CARICA reports on bottlenecks and traffic flows.

This document will follow given methodology for bottleneck collection. The main goal of the document is to give insight in state of the Port of Ortona and show any possible flaws in traffic flows that occur.

DEFINING THE SCOPE OF STUDY

The purpose of this document is to analyse bottlenecks in the Port of Ortona. As a part of the activity D.3.2. that will analyse physical and non-physical bottlenecks in the Adriatic Area, more precisely, in six ports: 3 Croatian (Rijeka, Ploče, Split) and 3 Italian (Fusina, Bari and Ortona).

This analysis is done as a part of the CHARGE project, and data about bottlenecks were collected in 1 month period of time. Data were collected form own sources, port operators, custom administration, concessionaires, marine police, local and national public authorities. Data collected are mainly statistical data that show turnover of cargo. There are also data about terminals and their capacity, other infrastructure and road and railway connections, as well as marine links. These collected data will be compared with data of other big European ports in near vicinity. Data will be compared in absolute numbers and in percentage to show the development trend of the Port of Ortona.

DEFINING THE AREA UNDER STUDY AND CHARACTERIZING RESPECTIVE AREA

The city of Ortona is located in the East of Abruzzo Region, on the Adriatic Sea, at the top of a 70 meter-high cape. The area is characterized by a rocky coast with sandy beaches and by the presence of gravel and pebbles. Because of the cape, there are two inlets that have always made the coast area suitable to be a boat shelter. In this context, the Port of Ortona has developed since the Roman period and it has always been a strategic node for the area.

Figure 1: Map of Ortona area. (SOURCE: www.buonefra.com)

Central Adriatic Ports Authority

The Port of Ortona is part of the Central Adriatic Ports Authority (*Autorità di Sistema Portuale del Mar Adriatico Centrale*) which also includes the ports of Pesaro, Falconara Marittima, Ancona, San Benedetto del Tronto and Pescara. The Authority has competence on a 215 km long shore. Central Adriatic Ports Authority has been instituted following the publication of the national legislative decree **D.Lgs.169/2016,** i.e. the reform of the national port systems. The national decree D.Lgs.169/2016 and the **National Strategic Plan for the Logistics Port 2015** *(Piano Strategico Nazionale della portualità e della logistica)* have defined the main objectives of Port Authorities mainly requesting:

- To guide, plan, coordinate, regulate, promote and control port services and operations as well as all the commercial and industrial activities carried out by the ports and their territorial districts;
- To manage the ordinary and extraordinary maintenance of common parts in the port areas, including the maintenance of seabed;
- Commitment and control of the activities aimed to give a supplying upon payment to port users of general interest services;
- Coordination of administrative activities carried out by public bodies and organizations within the ports and in the public maritime areas included in the territorial district;
- Exclusive administration of areas and assets of the maritime state property under his own responsibility;
- To promote forms of connection with the different types of logistics systems in the port areas.

In 2018 the ports of Central Adriatic Ports Authority registered a 1.163.720 passenger traffic. Freight traffic reached 11.832.439 tonnes[1] (empties included), of which 5.037.748 tonnes are liquid goods (crude oil and refined oil products) while 6.794.691 tonnes are solid goods (both

[1] ESPO data ("Rapporto Statistico 2018", Central Adriatic Ports Authority).

bulk and unitized). A significant amount of 6.731 new vehicles exported (12.789 tonnes), was registered in 2018 in the Ports of Ancona and Ortona.

Special Economic Zones (ZES)

The development of the Port of Ortona can be positively influenced by the institution of the Special Economic Zones (*Zone Economiche Speciali* = ZES). Abruzzo Region has approved the Regional Government Deliberation **DGR 122/2019** regarding the ZES framework and the Port of Ortona – included in one ZES – has been considered one of the infrastructural nodes pivotal for the Regional logistic system due to its key role as link between the Region and the TEN-T Scandinavian-Mediterranean corridor.

According to the Deliberation, the **Strategic Development Plan of Abruzzo Region 2019** (*Piano Strategico di Sviluppo della Regione Abruzzo*) has been issued. The plan regards the characteristics, the analysis and strategies of the Region areas included in the ZES.

In the national legislative decree **D.Lgs.91/2017** (*Misure di sostegno alla nascita e alla crescita delle imprese nel Mezzogiorno*) a ZES is defined as a delimited and identified geographical area formed by different zones with functional economic relations. The decree points out that every ZES must include a port area which respects the characteristics established by the **European Regulation n. 1315 (11/12/2013),** issuing the revised TEN-T network.

The aim of including the Port of Ortona in the ZES is to create better economic, financial and administrative conditions in the port area in order to improve the development of the already operative companies as well as the settlement of new companies.

Moreover, Abruzzo Region aims to exploit the relevance of the ports of Ortona and Vasto as key nodes for import, in order to create favourable conditions for a new development of the area. The institution of the ZES allows the area to be eligible for investment funding and other benefits such as the simplification of administrative procedures, tax exemption policy and the insertion in the already existing infrastructures.

The Port of Ortona – characteristics and traffic

The **Port of Ortona** is the main multi-functional commercial seaport of Abruzzo Region and it is specialized in the handling of bulk, general cargo and project cargo.

Located in the central Adriatic Sea coast, the port stands in a strategic position for the industrial areas of Central Italy and it is suitable for cargo, Ro-Ro and passenger traffic. The port is connected to A14 (North-South) and to A25 (East-West) highways. Furthermore, the port is linked to the railway network by a single track leading to Ortona station, on the Adriatic railway line (North-South).

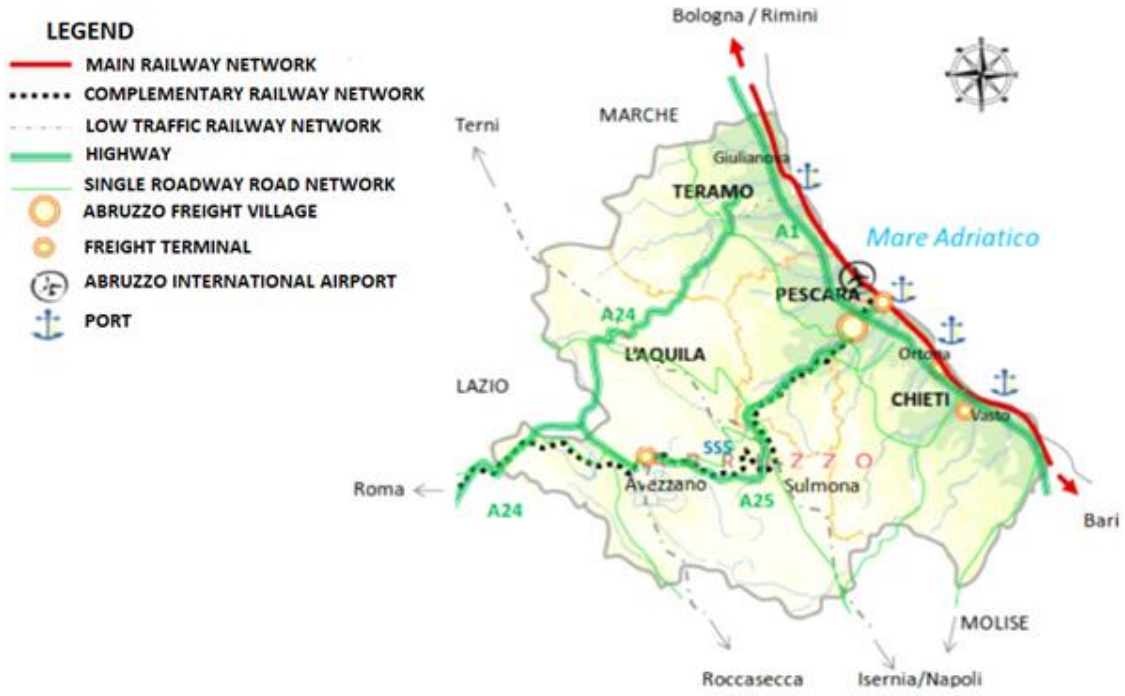

Figure 2: The railway network and the road network of Abruzzo Region (SOURCE: Proposal for identifying a ZES in Abruzzo Region, 31/10/2018)

Figure 3: The connection between the Port of Ortona and the railway network. (SOURCE: Google maps)

The Port of Ortona is neither part of the TEN-T network up to date nor it is included in the Scandinavian-Mediterranean (ScanMed) Corridor. Currently, the reference railway of the Port of Ortona (Ortona-Fossacesia line) is part of the Comprehensive Network, on the branch of the Adriatic line (Ancona-Bari) which is not part of the ScanMed Corridor.

Figure 4: Ortona area, the ScanMed Corridor and the TEN-T Comprehensive Network. (SOURCE: TENTec)

The Port of Ortona is fully integrated in the Regional policy and framework of the ZES. The following maps show the level of integration of the Port within the ZES and the exact border of the ZES within the harbour area.

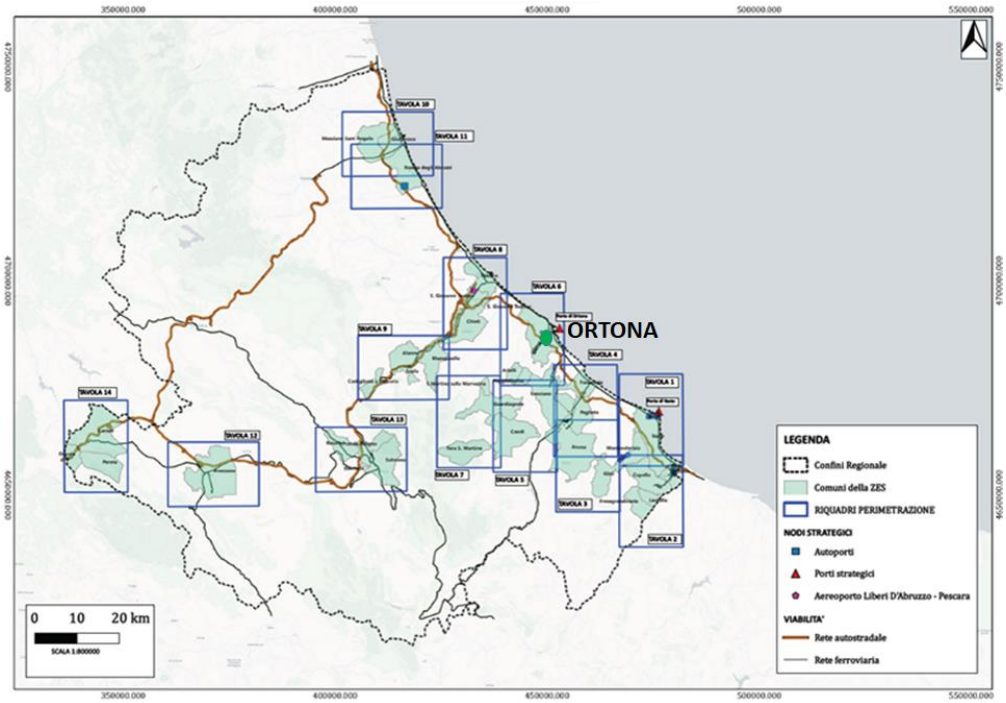

Figure 5: ZES in Abruzzo Region, included Ortona area. (SOURCE: Strategic Development Plan of Abruzzo Region 2019)

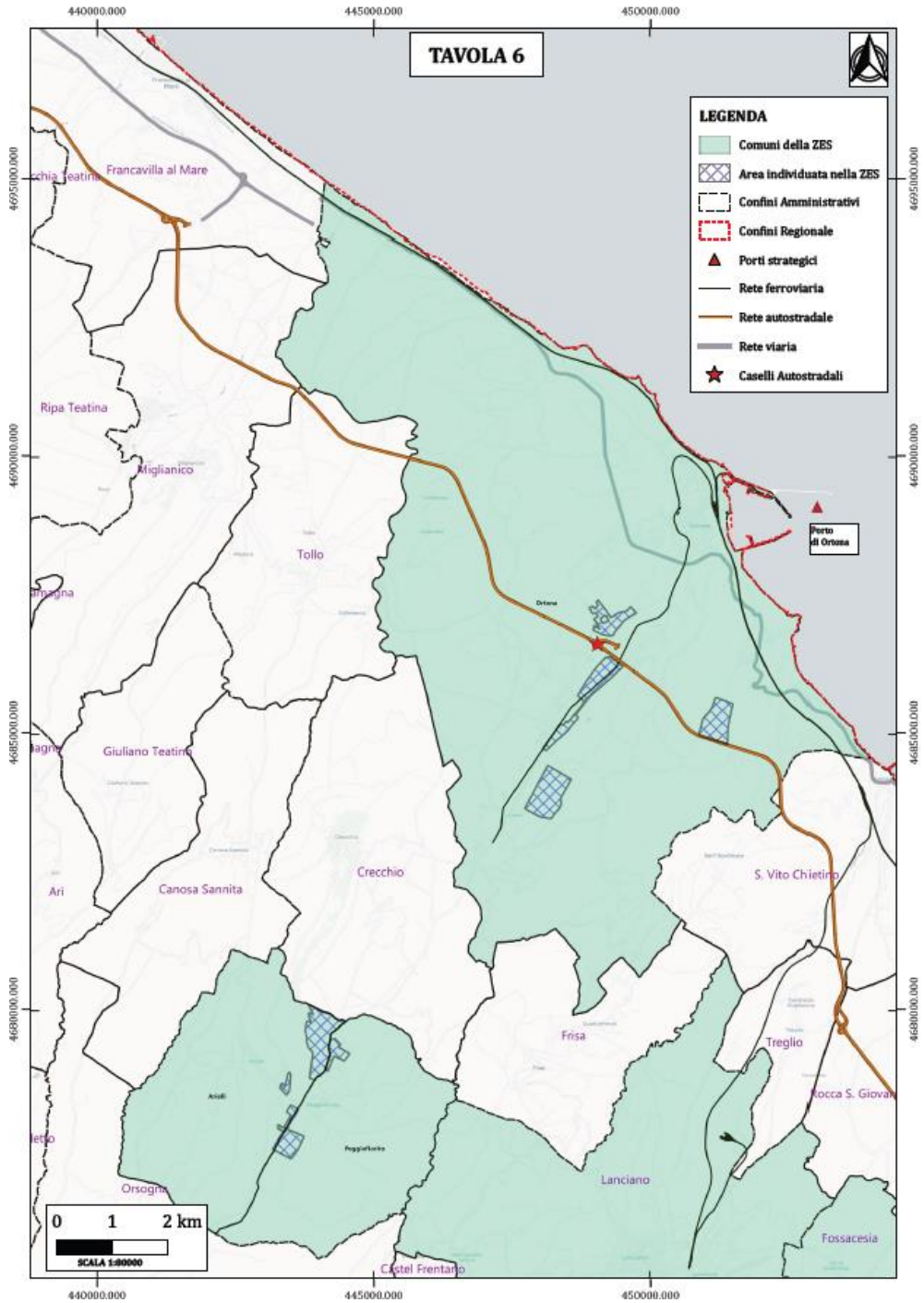

Figure 6: The ZES of Ortona. (SOURCE: Strategic Development Plan of Abruzzo Region 2019)

D.3.2.3-4. Analysis of the physical and non-physical bottlenecks in Italy and Croatia

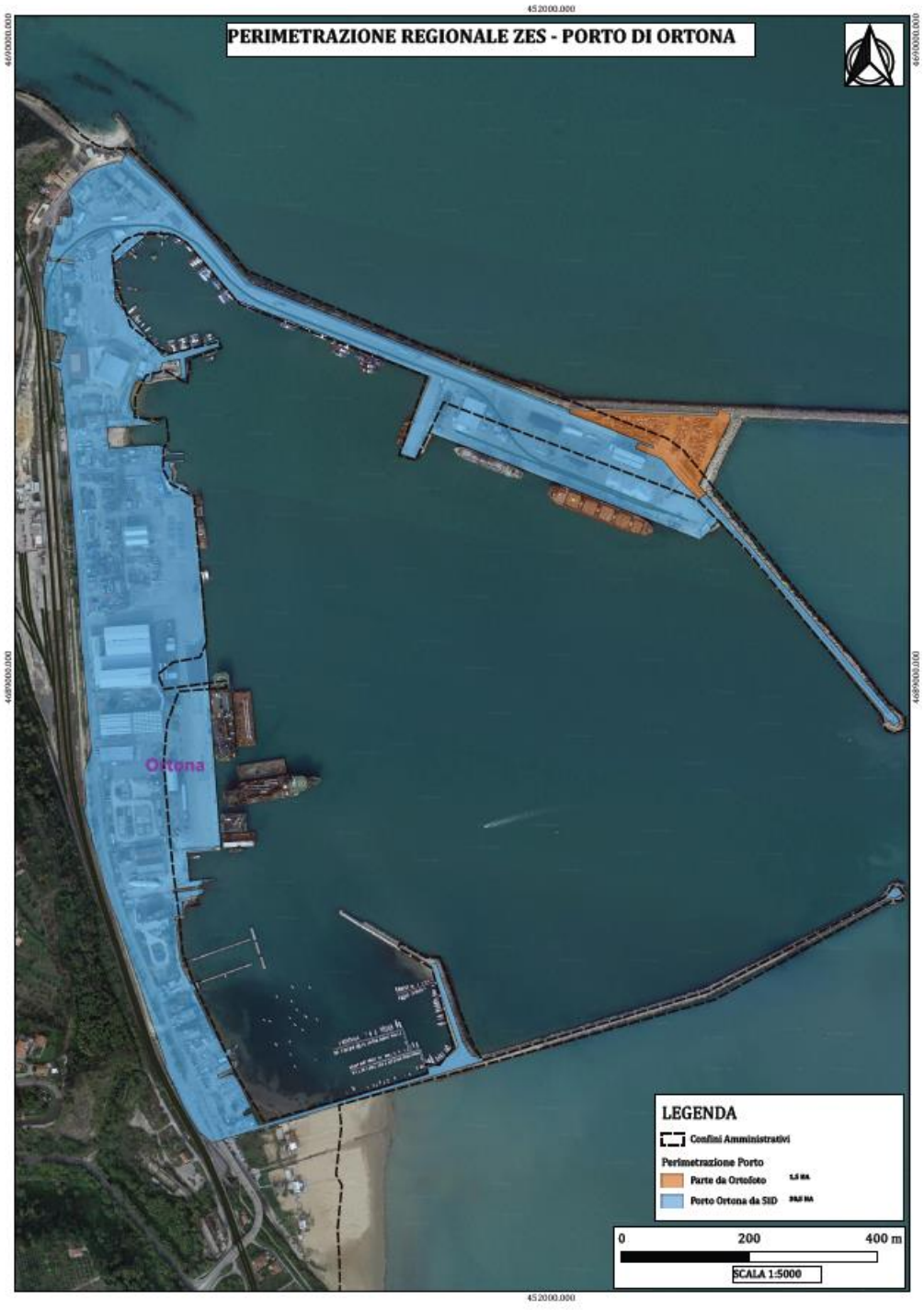

Figure 7: The ZES within the Port of Ortona area. (SOURCE: Strategic Development Plan of Abruzzo Region 2019)

Focusing on the specific port characteristics, Ortona shows a significant water and land surface, warehouses and national depots, customs services, docks equipped with port cranes and it is possible to receive Handymax Panamax ships. The port is characterized by two breakwaters that

delimit the harbour entrance. The total extension of the North Pier is about 1.500 meters, while the South Pier one is about 1.100 meters. According to the **Port Regulatory Plan** (*Piano Regolatore Portuale - PRP*), the main technical features of the port are:

- Water surface: 1.000.000 sqm (100 hectares);
- Maximum depth of the natural seabed (at the harbour entrance): 8,0/8,5 meters above sea level;
- Average depth of the access canal: 7,0/7,5 meters above sea level;
- Average depth of the internal dock: -6.5 meters above sea level;
- Land surface: about 260,000 sqm (26 hectares);
- Overall development of the operational quays: more than 1.350 meters.

The operative quays are:

- NORD NUOVA: 457 meters length, max 6.80 meters draught, 200 meters max ship length allowed, total area 50.000 sqm;
- MARTELLO PIER: 130 meters length, max 5.70 meters draught, 130 meters max ship length allowed, total area 2.500 sqm;
- RIVA – RIVA NUOVA: 496 meters length, max 5.70 meters draught, 180 meters max ship length allowed, total area 50.000 sqm;
- NORD: 474 meters length, max 5.70 meters draught, 70 meters max ship length allowed, total area 20.000 sqm;
- MANDRACCHIO PIER: 90 meters length, max 5,70 meters draught, 60 meters max ship length allowed, total area 600 sqm
- SARACENI AND TOURISTIC PIER: 182 meters length, max 3 meters draught, 8 meters max ship length allowed, total area 2.500 sqm;

Figure 8: The main sections of Port of Ortona. (SOURCE: Adriatic Stevedoring Company)

The main services offered by the port are:

- Goods weighing;
- Goods accounting;
- Package reconditioning;
- Filling, emptying and maintenance of containers;
- Vehicles stacking.

Other relevant services offered are: national customs warehouses, national and international shipments, fire prevention services, slipway, crane, travel lift, engine repair, electrical slide and repairs, reserved areas for leisure boats at the 100 meters long southern pier managed by the Maritime District and at the 70 meters long dock managed by the Navy League.

The structure of the management offices consists in the Harbor Master's Office, an Office Maritime District and a Customs Office. Moreover, about the administrative competences:

- Abruzzo Region is in charge of programming, administrative management and planning of the State Property together with SIT (formerly Civil Engineers Maritime Works);
- Municipality of Ortona and the A.S.I. (consortium for the industrial development) take care of the general planning;

- Maritime Directorate, State Police, Financial Police, Coast Guard and the Customs deal with the State Property and Security.

The Port of Ortona has been classified as a port of national economic importance with **the national law 84 of 1994.** Currently, the port performs multiple functions:

- industrial and commercial traffic, specifically the transport of dry bulk goods, liquid bulk goods and containerized goods;
- Shipbuilding (construction / renovation and storage of pleasure boats);
- Fishing;
- Yachting and nautical tourism.

The following table shows the clustering of goods by categories.

	2016	2017	2018			2017/2018
	TOTAL	TOTAL	LOADED	UNLOADED	TOTAL	%
LIQUID GOODS* (Tonnes)	430.337	409.460	0	430.294	430.294	5 %
SOLID GOODS** (Tonnes)	616.486	614.617	100.597	469.718	570.315	-7%
NEW VEHICLES EXPORTED (Tonne)	-	10.897	12.721	22	12.743	17%
TOTAL GOODS (Tonnes)	**1.019.041**	**1.034.974**	**113.318**	**900.034**	**1.013.352**	**-2%**
VEHICLES EXPORT (#)	-	4.707	6.695	0	6.695	42%
PASSENGERS (#)	**638**	**642**	**-**	**917**	**917**	**43%**

*Table 1: Port of Ortona: freight traffic 2016 by goods categories[2] (SOURCE: Statistical report 2018) *: including liquid bulk (refined oil products); **: including dry bulk (438.014 Tonne in 2016) and dangerous goods (298 Tonne). Data are split into such sub-categories for 2016 only.*

In 2016 the Port of Ortona registered a traffic of 653 passengers to/from Croatia and 1.019.041 tonnes of goods. Specifically, the total amount achieved by liquid goods and solid goods was respectively 430.337 tonnes and 616.486 tonnes. In 2017 409.460 tonnes of liquid goods and 614.617 tonnes of solid goods were recorded, with a slight negative variation of 5% and 0,3%. However, the total goods increased of 1,6% thanks to 10.897 tonnes of new vehicles

[2] SOURCE: Three-year Operational Plan 2017-2020 and Statistic Report 2018.

exported (4.707 vehicles in total). The number of passengers registered was 642, quite steady with the previous year. In 2018 1.013.352 tonnes were handled in the Port of Ortona, split into 430.294 tonnes of liquid goods and 579.315 tonnes of solid goods. The new vehicles exported were 6.695, for a total amount of 12.743 tonnes, whereas the passenger traffic significantly increased to 917 (+43%). Between 2017 and 2018 the traffic of solid goods decreased by 7%, while liquid goods increased by 5%. The new vehicles exported, instead, increased by 17%, with the number of vehicles enhanced by 42%. In 2018 the unloaded amounts were always higher than the ones loaded, except for the vehicles exported.

Scenarios and programming documents for the Port of Ortona

The most relevant document for the planning of the future port development is the **Port Regulatory Plan** (*Piano Regolatore Portuale - PRP*). Originally approved in 1969, the updated version of 2010 has been adopted with the **decree n. 75/2015** of Ortona Coast Guard, even if it is waiting for the last approval by the Regional Council (which still has to receive the new national legislation on port management). The plan includes a complete overview of the characteristics of Ortona area and the port. Furthermore, it foresees new capacities and functions for the port thanks to the investments related with the Abruzzo Masterplan, which aims to achieve higher accessibility, wider manoeuvring spaces, better ground operations and links with the hinterland. The future operational availabilities for the port are:

- 5 moorings for ro-ro and Ro-pax ships 220 m long (with 10m depths);
- 4 multi-purpose docks of 650m, 440m, 550m, 250m length;
- 600m long quays adjacent to oil docks;
- 3 berths for oil tankers.

A further relevant document for the strategies regarding the Port of Ortona is the **Three-year Operational Plan 2017-2020** (*Piano Operativo Triennale*) of Central Adriatic Ports Authority. The plan lists the main operational actions programmed for the development of Ortona port and area.

The importance of the Port of Ortona is evidenced in the **Regional Integrated Transports Plan** (*Piano Regionale Integrato dei Trasporti – PRIT*). Indeed, the Port is classified as a local port of national interest and it is considered a strategic node for the future development of the area, key to develop logistic and integrated mobility in the Region. The plan foresees a central role of Ortona in the development of maritime traffic in Adriatic Sea, due to its strategic and unique location as the only relevant commercial port between Ancona and Apulian ports. Moreover, in the Regional Plan a relevant role of Ortona port is expected in the short-distance trans-Adriatic passenger lines, whilst a possible role in container transport among Mediterranean, the Black Sea and the hub port of Taranto (Ionian Sea) is foreseen.

Finally, the **Strategic Development Plan of Abruzzo Region 2019** (*Piano Strategico di Sviluppo dell Regione Abruzzo*), already mentioned as a framework document for the ZES, reports the actions planned for Ortona Port and area. The document foresees a future scenario in which the port assumes a pivotal role in the freight land corridor between Thyrrenian and Adriatic Sea (Civitavecchia-Ortona/Pescara). Indeed, thanks to the steady-to-increasing commercial exchanges between Italy and the Mediterranean countries and the increasing growth rates of Turkey, East Europe and Middle East, the development of a combined maritime-land transport corridor - and the planning of new commercial routes between the Iberia peninsula and the Balkan countries through Italy as a landbridge - has to be taken into account. This would enhance the role of Ortona as a key node for Ro-Ro traffic, linking Adriatic routes with the Italian landbridge within the corridor. **This scenario evidences the opportunity of including Ortona in the Scandinavian-Mediterranean (ScanMed) Corridor, and the necessity for the port to fulfil the infrastructure requirements necessary for the inclusion in the Comprehensive Network. This goal is strictly connected to the necessity to improve the infrastructural endowment of the Port of Ortona, as concerns both port infrastructure and road/rail connections.**

LISTING OF ALL BOTTLENECKS AND UNDESIRABLE EFFECTS

The results of the bottleneck survey have been collected through the questionnaire below. The questionnaires have been filled by the most relevant stakeholders of the Port of Ortona (see ANNEX 1), namely:

- The Port Authority;
- The Coast Guard;
- The Custom administration;
- Representatives of maritime agencies.

The template used for the survey is the following.

Bottleneck			Question	Answer	Relevance
infrastructural bottlenecks	road	safety	Is the connection between the terminal and highway network at a satisfactory safety level?		
			Is there a regular maintenance of the terminal roads and connection between the terminal and highway network?		
			Are there clearly marked routes for accessing the terminal and leaving the terminal in order to reach the highway network?		
			Is there adequate (satisfactory) lighting on the terminal roads and connection between the terminal and highway network?		
			Are there clearly marked routes to get to the terminal and to the highway network?		
		flow capacity	Is there a direct access to the highway network?		
			Is the current capacity of the road infrastructure sufficient?		
			Is there a sufficient number of lanes on terminal roads and connection between the terminal and highway network?		
			Is the width of the lanes on the terminal roads and connection between the terminal and highway network appropriate (satisfactory)?		

			Is the connection between the terminal and highway network passing through the urban and inhabited area?		
			Is there a road and pedestrian crossing on the railway?		
	rail	safety	Is the signalization on a satisfactory level?		
			Is there adequate (satisfactory) lighting on the terminal railway infrastructure?		
			Is there a regular maintenance of infrastructures relevant for the satisfactory level of security?		
			Is there a road and pedestrian crossing on the railway?		
			Are the crossings satisfactory marked?		
		flow capacity	Is the current capacity of railway infrastructure satisfying?		
			Is it the connection of railway and road infrastructure at a satisfactory level?		
			Is it possible to dispatch the maximum allowed quantities of the train at once?		
			Is there a ramp for the loading/unloading of the trucks on the railway?		
	inland waterways	safety	Is the safety level of the port access satisfactory?		
		flow capacity	Is the area of the port basin sufficient?		
			Is the capacity of the access to the terminal sufficient so the barges shouldn`t be separated?		
			Is there a RO-RO ramp on the terminal?		
	terminal	capacity	Are the parking spaces adequately signposted for identification?		
			Is the capacity of a parking lot sufficient?		
			Is parking space able to accommodate all dimensions of the vehicles / units?		
			Are the roads at the terminal separated from waiting areas for the loading / unloading cargo?		
			Is the number of berths for mooring ships sufficient?		
			Are the lengths of berths sufficient for mooring the largest vessels?		
			Are the sea depth/draft berths enough for the biggest ships?		
			Is the sea depth in the driveway shore/terminal satisfactory for the biggest ships?		

			Is there a storage space near the berth?		
			Does the space for storage of goods have sufficient capacity?		
		safety	Does the terminal (individual bindings) have conditions of secure mooring?		
			Is the sea access to the terminal sufficient (maritime safety requirements)?		
		weather	How much time a year is the terminal out of function for bad weather?		
a supply chain bottlenecks		work shifts	Is it guaranteed cargo handling 24 hours a day every day of the year?		
			Is there a guaranteed flexibility in the composition of stevedoring crews and handling equipment to absorb demand peaks in loading / unloading services?		
		information exchange	Is there a system which allows the electronic exchange of documents and communications between the driver unit and the terminal?		
		time response	PILOTS - Is it the time required from the request to reaction at a satisfactory level?		
			TUGS - Is it the time required from the request to reaction at a satisfactory level?		
		cooperation	Is the cooperation between the terminal and the agent at a satisfactory level?		
			Is the administrative co-operation of the terminal and Ship at a satisfactory level?		
		technology	Is the cargo handling capacity of the terminal sufficient?		
			Does the shore cranes terminal have sufficient performance /capacity?		
			Does the mobile cranes terminal have sufficient performance /capacity?		
			Is there in the function the VTMIS system?		
regulatory bottlenecks		customs	Is the cooperation between the Customs Authority and Ships at a satisfactory level?		
		inspections	Is the time required for inspection (veterinary, phytosanitary, etc.) at a satisfactory level?		
		cabotage restrictions	Are there any cabotage restrictions?		
		other	Is there an exemption obligations pilots for ships in service, which regularly touch the port?		

			Is there an exemption obligations tugs for ships in service, which regularly touch the port?		

Despite the different answers, a list of the commonly identified key bottlenecks affecting the Port of Ortona can be drafted. The key bottlenecks are listed below by priority and clustered in three categories: infrastructural, supply chain and regulatory bottlenecks. The most significant bottlenecks will be commented in detail in the following section.

The **infrastructural bottlenecks** identified from the questionnaires are:

- Insufficient sea depth/drafts for bigger ships;
- Insufficient sea depth in the driveway shore of the port for the biggest ships;
- Absence of Ro-Ro ramp in the port;
- Absence of a direct access to the highway in the Ortona area;
- Low capacity of railway infrastructures;
- Low efficiency in dispatching the maximum allowed quantities of the train at once;
- Absence of a ramp for loading/unloading of the tracks in the railway;
- Lack of adequate parking lots and parking spaces not well signposted for identification;
- Insufficient number of berths for mooring ships;
- Low capacity of road infrastructures;
- Unsatisfactory Crossing marks in the railway infrastructures;
- Low level of safety of the access to the port in accordance with the Maritime requirements;
- Insufficient number lanes in the road infrastructures;
- Lack of regular maintenance of roads in the port;
- Unsatisfactory width of lanes in the road infrastructures;
- Lack of regular maintenance of railway infrastructures;
- Unsatisfactory signalization in the railway network;
- No separation between port roads and waiting areas for loading/unloading;

- Parking space no able to accommodate all dimensions of the vehicles / units.

The **supply chain bottlenecks** identified from the questionnaires are:

- Absence of a VTMIS (Vessel Traffic Management Information System) in the port;
- No cargo handling 24 hours a day every day of the year;
- Lack of flexibility in the composition of stevedoring crews and handling equipment.

The **regulatory bottlenecks** identified from the questionnaires are:

- No restrictions to cabotage;
- Insufficient time for inspection (veterinary, phytosanitary, etc.);
- Low level of exemption obligations of pilots and tugs.

ANALYSING OF LISTED BOTTLENECKS AND THEIR CAUSATIVE RELATIONS

The survey performed through the questionnaires reveals that the Port of Ortona shows relevant bottlenecks to be overcome, both infrastructural and supply chain.

The outcome of the survey mirrors the same conclusions reported in the Port Regulatory Plan, in particular as regards the bottlenecks related to the connection between the city and the Port:

- **Separation due to the orography**: the port and the city of Ortona are divided by steep and unstable slopes which hamper the efficient connection between the two places of interest;
- **Separation due the lack of infrastructures**: the connection between the city and the port is limited by the low efficiency level of the Adriatic railway line and the Via della Cervana road used both for urban mobility and for freight traffic to and from the port;
- **The port size:** the port is a large infrastructure with a relevant role with respect to the medium size of the City of Ortona. Therefore, the interventions needed for the port risk to have not sufficient political support (e.g. compared to ports located in big cities), with the connected risk to focus investment priorities in more dense port areas. The insertion of Ortona in the current port cluster managed by Central Adriatic Ports Authority is an effective alleviating measure against the above-mentioned risk.

Moreover, the Port Regulatory Plan reports a deep territorial discontinuity caused by the following problems:

- **Low level accessibility of coastal areas**;
- **Physical barrier constituted by the railway line** (discontinuous coastal territories with visual and physical impediment to direct access to the state-owned areas);
- **Rural and agricultural use of private lots** between the state-owned area and the railway line to the detriment of the tourist potential on the coast;
- **Morphological and orographic conformation of the territory**, with the coast and the mountainous area near to each other and with spread infrastructural networks.

Afterwards, the Port Regulatory Plan focuses on the problems directly related to the Port of Ortona:

- **Maritime and navigational problems because of a lack of an outer harbor**, which causes wave agitations and reduction of the operation of the quays.
- **Lack of continuity between the Riva and Nord quays**, which are physically separated by the fishing area and by the proximity in the use of spaces and docks.

Finally, the Plan mentions the Regional Integrated Transports Plan for further problems related to the Port of Ortona:

- **Limited sea depth in the port entrance and internal docks;**
- **High level of wave motion inside the port;**
- **Insufficient sea depth available at the beginning of existing docks;**
- **Difficult usage of Riva quay due to the physical constraint constituted by a planimetric and altimetric discontinuity.**

According to quantity of problems reported in the questionnaires and the problems indicated in the Port Regulatory Plan, it is evident that **infrastructural bottlenecks** are the most critical ones, concerning road and railway accessibility, as well as seaside infrastructure and terminal capacity.

Road: the absence of a direct access to the highway and the low capacity of the road infrastructures may cause traffic congestion in case of a constant increase of the maritime traffic. The insufficient number of lanes and the absence of efficient connections between the port and the highway are critical issues as well. Moreover, the unsatisfactory width of lanes affects the general capacity of the area and the lack of regular maintenance of roads represent an issue for the safety of the area. The improvement of the road accessibility may increase the cargo traffic in the Port thanks to a congestion reduction and a higher capacity.

Railway: the current rail connection from the port to Ortona station shows many infrastructural shortcomings, causing severe limitations to the capacity of transporting goods by rail to Ortona inland catchment area. Among limitations, the low maximum train weight allowed on the track, the presence of many crossings (since the track is built on a road), and the lack of a

loading/unloading ramp. Those are the key identified bottlenecks concerning rail connection. They contribute in reducing the attractiveness of the Port for the stakeholders organising inland repositioning services (terminal managers, logistics operators, etc.). Furthermore, the obsolete signalling and the lack of regular maintenance of the rail branch gives the perception of low safety standards. Because of such inadequacy factors, future substantial improvements of the rail connection become fundamental to achieve acceptable safety levels and to increase the opportunities to organise intermodal transport relations from/to the Port of Ortona. Currently, the railway split of inland transport from Ortona is zero.

Seaside: the capacity and the efficiency of port operations are hampered by the insufficiency of sea depth/drafts, the low level of sea depth in the driveway shore for bigger ships, the insufficient number of berths for mooring ships are perceived as the most important bottlenecks concerning the seaside characteristics of the port.

Terminal: the main bottleneck concerning the terminal – and thus the capability of the port to host efficient solutions of intermodal transport – is the absence of a Ro-Ro ramp. The construction of the main key facility for Ro-Ro is fundamental to develop this kind of traffic in the Port of Ortona. Moreover, other bottlenecks related to the terminal and landside area of the port are the lack of adequate parking lots, parking spaces not well signposted for identification. In particular, the absence of separation between roads and waiting areas for loading/unloading heavily affect the efficiency of port operations.

The improvement of Port infrastructure is fundamental for the future growth of the Port of Ortona, to ensure, higher efficiency, capacity and safety. The main objective of Central Adriatic Ports Authority is to solve the infrastructural bottlenecks of Port of Ortona in order to aim at the inclusion in the TEN-T Comprehensive Network.

As concerns **supply chain bottlenecks**, the most critical issue is represented by the lack of a VTMIS system. The implementation of this ICT tool has a high relevance in order to achieve a better and faster data sharing as well as to increase the effectiveness of port and maritime activity operations. Further reported bottlenecks are the lack of 24/7 cargo handling service and

by the scarce flexibility in the composition of stevedoring crews and handling equipment. Although these are not considered as critical issues, their resolution could increase the organizational efficiency of the port in terms of less time needed for ordinary operations.

PROPOSING SOLUTIONS OF BOTTLENECKS AND ANALYSING HOW IT WILL AFFECT FUTURE FREIGHT FLOWS

The introduction of Ortona area in the ZES is a great opportunity to foster the development of the port activity and interventions aimed to improve the port infrastructure. Indeed, the creation of the ZES succeeded to attract the attention of decision makers on the importance for Ortona area to be served by a competitive port, with the ultimate goal to include it in the TEN-T Comprehensive Network. Therefore, ZES has generated a positive impact on planning actions of the Port of Ortona, placing Ortona among strategic priorities of Abruzzo Region and Central Adriatic Ports Authority.

In order to face the problems related with the bottlenecks analysed in the previous chapters, relevant solutions have been already identified in the programming documents issued by the Central Adriatic Ports Authority for the Port of Ortona (see ANNEX 2).

The most relevant planned infrastructure actions to overcome the bottlenecks of the Port of Ortona are the following:

- **Excavation and deepening of the seabed of Ortona harbour basin**;
- **Connection with the A14 highway**;
- **Completion of railway infrastructures serving the Port of Ortona**;
- **South Pier Extension**.

The main programming level and state of the art of such interventions are summarised in the following table. As depicted there, the most important regional programming documents, as well

as the Three-year Port Operational Plan and the Programming Contract between the Ministry and the National Rail Infrastructure Manager, include all of these priority measures. However, the revamping of the rail connection to the harbour is just foreseen as element of possible collaboration between RFI and the Port Authority (in the three-year Operational Plan), although not planned nor financed.

INTERVENTION	PLANNING DOCUMENTS	PROGRESS
Excavation and deepening of the seabed of Ortona harbour basin	• Strategic Development Plan of Abruzzo Region 2019 • Three-year Operational Plan 2017-2020	Implementation phase (9.400.000 €)
Connection with the A14 highway	• Strategic Development Plan of Abruzzo Region 2019 • Port Regulatory Plan	Implementation phase (2.000.000 €)
Completion of railway infrastructures serving the Port of Ortona	• The Programming Contract 2017-2021 between Ministry of Infrastructure and Transport and RFI • Three-year Operational Plan 2017-2020 • Strategic Development Plan of Abruzzo Region 2019 • Port Regulatory Plan	Implementation phase (1.700.000 €)
South Pier Extension	• Strategic Development Plan of Abruzzo Region 2019 • Port Regulatory Plan	Implementation phase (40.500.000 €)

Table 2: Main interventions planned in the Port of Ortona (SOURCE: "Completamento interventi sul Porto di Ortona" Masterplan Abruzzo Region, 2018)

In conclusions, the solutions planned aim to increase the relevance of Port of Ortona**. The improvement of port infrastructure and facilities is the necessary condition to increase the port traffic and competitiveness**. Indeed, taking in account the strategic position as a pivotal link along the Mediterranean, in the middle of an ideal land-sea corridor between the Iberian Peninsula and the Balkan countries, **the Port of Ortona may be included in the TEN-T Comprehensive Network**. To achieve this objective, the solutions aimed to improve the road and railway connections, together with the dredging of the sea basin, become fundamental to verify the minimum conditions to achieve this goal.

CONCLUSIONS

The Port of Ortona is the main multifunctional commercial seaport of Abruzzo Region and it is part of Central Adriatic Ports Authority. After the institution of the Abruzzo Region ZES areas, the port has been considered a pivotal infrastructural node and a development planning has been started for the Ortona area.

The main problems related to the Port of Ortona regard the infrastructural bottlenecks. Particularly, the insufficient sea depth of the seabed, the lack of road and railway infrastructures as well as the low development of port infrastructure (e.g. absence of Ro-Ro ramp, insufficient number of berths) hamper the enhance of the capacity, security and efficiency of the Port of Ortona. Consequently, the overall surrounding area is negatively affected by these issues and its development is slowed down.

In order to solve these problems, several solutions are foreseen. Indeed, different interventions of dredging are planned, despite bureaucracy and political problems occurred between Central Adriatic Ports Authority, Ortona Coast Guard and Abruzzo Region have affected the procedure causing delays in the procedure[3]. Moreover, a direct connection between the highway and the port, an improvement of railway infrastructures (double-track implementations) and port infrastructure thanks to the construction of new quays, berths docks, Ro-Ro ramp and other facilities are planned.

Others infrastructural interventions as well as solutions for supply chain and regulatory bottlenecks are needed in order to increase the capacity, the security and the efficiency of Port of Ortona. Despite such interventions are not foreseen in the short run, the inclusion of Ortona Area in the ZES can be an important incentive to foster the starting of planning phases and their realization in the long run. Therefore, the aim to achieve is the exploitation of Port and Ortona

[3] *Dragaggio del porto: lavori fermi e polemiche*, 03/03/2019, A. Sitti, www.ilcentro.it

area potentialities and the possibility for all stakeholders and citizens to take advantage of the correlated benefits.

The improvement of port infrastructure is fundamental for the future growth of traffic of the Port of Ortona, ensuring higher efficiency, capacity and safety. The main objective of Central Adriatic Ports Authority is to solve the infrastructural bottlenecks affecting the Port of Ortona. Indeed, port infrastructure and safety must be implemented to enable the increase of freight traffic flows, to make the request for the inclusion of Ortona in the TEN-T Comprehensive Network possible. Central Adriatic Ports Authority will foster the cooperation among all the Ortona area stakeholder in order to speed up the achievement of this objective.

ANNEX 1 – Questionnaires

Bottleneck			Question	Answer	Relevance	Answer	Relevance	Answer	Relevance	Answer	Relevance	Answer	Relevance	Answer	Relevance
				ADSPMAC		COAST GUARD		CUSTOM		MARITIME AGENCY 1		MARITIME AGENCY 2		MARITIME AGENCY 3	
infrastructural bottlenecks	road	safety	Is the connection between the terminal and highway network at a satisfactory safety level?	NO	MEDIUM	NO	MEDIUM	NO		NO	HIGH	NO	HIGH	YES	HIGH
			Is there a regular maintenance of the terminal roads and connection between the terminal and highway network?	YES	MEDIUM	NO	MEDIUM	NO		NO	MEDIUM	NO	HIGH	YES	HIGH
			Are there clearly marked routes for accessing the terminal and leaving the terminal in order to reach the highway network?	YES	LOW	YES	LOW	YES		YES	LOW	YES		YES	HIGH
			Is there adequate (satisfactory) lighting on the terminal roads and connection between the terminal and highway network?	YES	LOW	YES	LOW	YES		YES	LOW	YES		YES	HIGH
			Are there clearly marked routes to get to the terminal and to the highway network?	YES	LOW	YES	LOW	YES		NO	LOW	YES		YES	HIGH
		flow capacity	Is there a direct access to the highway network?	NO	MEDIUM	NO	MEDIUM	NO		NO	HIGH	NO		NO	MEDIUM
			Is the current capacity of the road infrastructure sufficient?	NO	MEDIUM	NO	MEDIUM	YES		NO	HIGH	NO		YES	HIGH
			Is there a sufficient number of lanes on terminal roads and connection between the terminal and highway network?	NO	MEDIUM	NO	MEDIUM	YES		NO	LOW	NO		YES	MEDIUM
			Is the width of the lanes on the terminal roads and connection between the terminal and highway network appropriate (satisfactory)?	YES	HIGH	NO	HIGH	NO		NO	LOW	NO		YES	HIGH
			Is the connection between the terminal and highway network passing through the urban and inhabited area?	YES	MEDIUM	YES	MEDIUM	NO		YES	MEDIUM	YES		NO	MEDIUM
			Is there a road and pedestrian crossing on the railway?	YES	LOW	YES	LOW		One track section exists. However, it is not used	YES	MEDIUM	NO		NO	HIGH
	rail	safety	Is the signalization on a satisfactory level?	YES	LOW	YES	LOW			NO	LOW	NO		NO	HIGH
			Is there adequate (satisfactory) lighting on the terminal railway infrastructure?	YES	LOW	YES	LOW			YES	MEDIUM	YES		NO	HIGH
			Is there a regular maintenance of infrastructures relevant for the satisfactory level of security?	YES	MEDIUM	YES	MEDIUM			NO	LOW	NO		NO	HIGH
			Is there a road and pedestrian crossing on the railway?	YES	LOW	YES	LOW			YES	MEDIUM	YES		NO	HIGH
			Are the crossings satisfactory marked?	NO	MEDIUM	NO	MEDIUM			NO	MEDIUM	YES		NO	HIGH
		flow capacity	Is the current capacity of railway infrastructure satisfying?	NO	MEDIUM	NO	MEDIUM			NO	LOW	NO		NO	HIGH
			Is it the connection of railway and road infrastructure at a satisfactory level?	NO	MEDIUM	NO	MEDIUM			NO	LOW	NO		NO	HIGH
			Is it possible to dispatch the maximum allowed quantities of the train at once?	NO	LOW	NO	LOW			NO	LOW	NO		NO	HIGH
			Is there a ramp for the loading/unloading of the trucks on the railway?	NO	LOW	NO	LOW			NO	LOW	NO		NO	HIGH
	inland waterways	safety	Is the safety level of the port access satisfactory?	YES	LOW	YES	LOW			/	LOW	NO		YES	HIGH
		flow capacity	Is the area of the port basin sufficient?	YES	MEDIUM	YES	MEDIUM			/	LOW	NO		YES	HIGH
			Is there a RO-RO ramp on the terminal?	NO	HIGH	NO	HIGH			NO	HIGH	NO	HIGH	NO	HIGH
	terminal	capacity	Are the parking spaces adequately signposted for identification?	NO	MEDIUM	NO	MEDIUM	NO		NO	LOW	NO		NO	MEDIUM
			Is the capacity of a parking lot sufficient?	NO	MEDIUM	NO	MEDIUM	NO		NO	LOW	NO		YES	MEDIUM
			Is parking space able to accommodate all dimensions of the vehicles / units?	YES	MEDIUM	YES	MEDIUM	NO		NO	LOW	NO		YES	MEDIUM

Bottleneck			Question	Answer	Relevance	Answer	Relevance	Answer	Relevance	Answer	Relevance	Answer	Relevance	Answer	Relevance
				ADSPMAC		COAST GUARD		CUSTOM		MARITIME AGENCY 1		MARITIME AGENCY 2		MARITIME AGENCY 3	
			Are the roads at the terminal separated from waiting areas for the loading / unloading cargo?	YES	LOW	YES	LOW	NO		NO	LOW	NO		NO	MEDIUM
			Is the number of berths for mooring ships sufficient?	NO	HIGH	NO	HIGH	NO		NO	HIGH	NO	HIGH	YES	HIGH
			Are the lengths of berths sufficient for mooring the largest vessels?	YES	LOW	YES	LOW	YES		NO	HIGH	NO	HIGH	YES	HIGH
			Are the sea depth/draft berths enough for the biggest ships?	NO	HIGH	NO	HIGH	NO		NO	HIGH	NO	HIGH	NO	HIGH
			Is the sea depth in the driveway shore/terminal satisfactory for the biggest ships?	NO	HIGH	NO	HIGH			NO	HIGH	NO	HIGH	NO	HIGH
			Is there a storage space near the berth?	YES	LOW	YES	LOW	YES		YES	MEDIUM	YES		YES	HIGH
			Does the space for storage of goods have sufficient capacity?	YES	MEDIUM	YES	MEDIUM	YES		YES	MEDIUM	YES		YES	HIGH
		safety	Does the terminal (individual bindings) have conditions of secure mooring?	YES	MEDIUM	NO	MEDIUM	/////		YES	MEDIUM	YES		YES	HIGH
			Is the sea access to the terminal sufficient (maritime safety requirements)?	NO	HIGH	NO	HIGH	////		NO	HIGH	NO		YES	HIGH
		weather	How much time a year is the terminal out of function for bad weather?	NO (less than 1 week)	LOW	NO	LOW	/////		NO		NONE		20 DAYS	
a supply chain bottlenecks		work shifts	Is it guaranteed cargo handling 24 hours a day every day of the year?	NO	LOW	NO	LOW	/////		YES	MEDIUM	YES		NO	MEDIUM
			Is there a guaranteed flexibility in the composition of stevedoring crews and handling equipment to absorb demand peaks in loading / unloading services?	NO	LOW	NO	LOW	/////		YES	HIGH	YES		YES	MEDIUM
		information exchange	Is there a system which allows the electronic exchange of documents and communications between the driver unit and the terminal?	YES	MEDIUM	YES	MEDIUM	/////		NO	LOW	NO		YES	MEDIUM
		time response	PILOTS - Is it the time required from the request to reaction at a satisfactory level?	YES	MEDIUM	YES	MEDIUM	/////		YES	HIGH	YES		YES	HIGH
			TUGS - Is it the time required from the request to reaction at a satisfactory level?	YES	MEDIUM	YES	MEDIUM	/////		YES	MEDIUM	YES		YES	HIGH
		cooperation	Is the cooperation between the terminal and the agent at a satisfactory level?	YES	MEDIUM	YES	MEDIUM	/////		YES	HIGH	YES		YES	HIGH
			Is the administrative co-operation of the terminal and Ship at a satisfactory level?	YES	LOW	YES	LOW	/////		YES	HIGH	YES		YES	HIGH
		technology	Is the cargo handling capacity of the terminal sufficient?	YES	MEDIUM	YES	MEDIUM	////		YES	HIGH	YES		YES	HIGH
			Does the shore cranes terminal have sufficient performance /capacity?	YES	MEDIUM	YES	MEDIUM	/////		YES	HIGH	YES		YES	HIGH
			Does the mobile cranes terminal have sufficient performance /capacity?	YES	MEDIUM	YES	MEDIUM	////		YES	MEDIUM	YES		YES	HIGH
			Is there in the function the VTMIS system?	NO	HIGH	NO	HIGH			NO		NO		NO	MEDIUM
regulatory bottlenecks		customs	Is the cooperation between the Customs Authority and Ships at a satisfactory level?	YES	HIGH	YES	HIGH	YES		YES	HIGH	YES		YES	HIGH
		inspections	Is the time required for inspection (veterinary, phytosanitary, etc.) at a satisfactory level?	NO	MEDIUM	NO	MEDIUM	NO	Improvements needed. Offices outside the port area; the release of certificates is slow	YES	MEDIUM	YES		YES	HIGH
		cabotage restrictions	Are there any cabotage restrictions?	NO	LOW	NO	LOW	NO		YES	MEDIUM	YES		NO	HIGH
		other	Is there an exemption obligations pilots for ships in service, which regularly touch the port?	YES	LOW	SI	LOW	/////		NO		NO		NO	LOW
			Is there an exemption obligations tugs for ships in service, which regularly touch the port?	YES	LOW	YES	LOW	//////		NO		NO		NO	LOW

ANNEX 2 – Programming documents of the Port of Ortona

The present annex section reports on the infrastructural actions relevant for the development of the Port of Ortona, as included in the main programming documents. The first part of the section concerns the "main interventions", as listed in Table 2 as prioritaire. The second part concerns all other infrastructure actions included in the main programming documents.

Main interventions

The **Port Regulatory Plan**, as concerns seaside and terminal infrastructure, identifies the **Extension of the South Pier** as fundamental intervention in order to improve the capacity of Port of Ortona and then allowing higher traffic flows in the future. As concerns roads and railway, the Port Regulatory Plan foresees the **doubling of the Pescara - Ortona railway line** as well as **the completion of the direct connection between the highway and the port** in order to allow higher intermodality and make possible a future growth of port traffics.

The **Three-year Operational Plan 2017-2020** (*Piano Operativo Triennale 2017-2020*) mentions the interventions planned in order to solve the main bottlenecks of the Port of Ortona. The actions already in progress are:

- The **dredging of seabed** (dredging of the port basin to the depth of -10 meters): an important intervention of dredging is foreseen in order to allow the port to receive higher class ships in the container sector as well as in general cargo and cruise;
- **Completion of the railway infrastructures** for the last mile and for the main network: a collaboration between the Central Adriatic Ports Authority and the Italian Railway Network (Rete Ferroviaria Italiana) will provide the empowerment of the station of Ortona (increase of the size of railway tunnels, restoration and improvement of the railway access to the port).

The **Strategic Development Plan of Abruzzo Region 2019,** published in the framework of the ZES, includes also the actions identified:

- **Port of Ortona connection with the tollbooth of highway A14**: the intervention aims to link directly the port with the highway in order to accomplish the "last mile" policies and consequently improve the capacities of the infrastructural node;
- **Completion of interventions in the Port of Ortona (Deepening dredging, south dam extension)**: these actions aim to extend the south pier of the port in order to reach a total length of 800 meters and to reach a seabed depth of 10 meters;
- **Excavation and deepening of the seabed of Ortona harbour basin**: this intervention aims to reach a higher depth for all the Ortona harbour basin;
- **Completion of railway infrastructures serving the Port of Ortona**: these interventions foresee the construction of a "catch and deliver" rail track, in addition of the one normal single track already in operation, in order to improve the store capacity of the railway wagons for the freight service. The railway infrastructures improvement has the objective to achieve the modernization, strengthening and development of the port area respect to the entire freight transport network at national and international level. Further interventions include the actions reported in the Programming Contract 2017-2021 (double-track in the north section of Ortona station, infrastructural and technological upgrading as well as completion of managerial performance adjustment of the Adriatica-Ionica section, specifically the TEN-T corridor Scandinavian-Mediterranean ports Adriatic and Southern Italy);

The **Programming Contract 2017-2021 between Ministry of Infrastructure and Transport and RFI (Italian Railway Infrastructure Manager)** (*Contratto di Programma 2017-2021 tra il Ministero delle Infrastrutture e dei Trasporti e Rete Ferroviaria Italiana*) includes two actions involving Ortona area:

- **The completion of the second-track rail in the section Ortona-Casalbordino** (southbound): the action is part of the wider project aimed at doubling the Adriatic line between Pescara and Bari. The doubling has a total cost of 299 M€, already financed by the Ministries of Economy and Infrastructure. The second track Ortona-Casalbordino is already in operation.

- **The construction of the second-track northbound from Ortona station**: the action foresees the construction of an extra new tunnel of 1 km with single-track. The action is included in the Pescara-Bari line doubling project as well. The second track is currently in construction.

These interventions will allow to achieve a higher capacity, a better traffic management and the possibility for HIGH CUBE semi-trailers and containers to use this railway section.

1.1 Other actions

Beyond the main interventions previously discussed, the **Port Regulatory Plan** illustrates further possible actions to improve the capacity and requalify the Port of Ortona. As concerns seaside and terminal infrastructure, the Central Adriatic Ports Authority identifies the following actions:

- Redevelopment of the North Pier;
- Construction of a new North dock for dangerous goods;
- Redevelopment of the North quay;
- Redevelopment of the Riva quay;
- Redistribution of areas of the existing basin;
- Redevelopment and redistribution of land spaces;
- Docking of the north breakwater;
- Construction of a slipway and a ferry dock;
- Purchase of a self-moving crane for handling containers.

Furthermore, the Port Regulatory Plan listed other interventions aimed to improve the main road system and to achieve an adequate interchange between public and private transport through the making of an adequate parking system. Therefore, these actions identified on the road network ensuring accessibility to the port are:

- The improvement of the provincial roads SS16 “Adriatica” and SS538 “Marruccina”;
- The realization of the Postilli - Riccio road connection.

In order to create an agenda for the short and long run, the Port Regulatory Plan splits the intervention needs in two Scenarios.

The “reference scenario” includes some planned key actions to be implemented by the Authorities (Province and ANAS) responsible for the road network maintenance and improvement:

- Improvement of the SS16 section North of Ortona as a continuation of the section already improved between Pescara and Francavilla al Mare;
- Realization of the connection viaduct between Ortona and the hospital area located in “contrada Sant’Andrea” along the A14 towards Ortona center town and the coast;
- Construction of a link between Via Don Arturo Morlupi and Via della Fontesanta and construction of a viaduct capable of connecting this ring road with Via De Ritis;
- Construction of the new road link between Ortona tollgate A14 and the SS16;
- Restoration of the "mid-coast" road that connects via Marina with the SS16 north of the railway line.

The “project scenario” includes interventions for which the Central Adriatic Ports Authority may have at least partial competence:

- Adaptation and expansion of the tracks to serve the North Pier, with consequent expansion of the railway area and repositioning of the border;
- Resetting and refunctionalization of via della Cervana road axis;
- Construction of a new road section connecting the port and via della Cervana near the lighthouse of Ortona with the Provincial Roads San Tommaso and the SS16.

The **Three-year Operational Plan 2017-2020** (*Piano Operativo Triennale*), lists the actions planned which can help to solve the bottlenecks of the Port of Ortona. The actions already in progress are:

- The **modernization of public lighting system**;
- **Renovation of forecourts superstructures,** particularly the improvement of the area and the quality of the spaces used for the goods storage and for the passengers handling;
- Construction of **new commercial quays**;

Further solutions are listed in the Three-year Operational Plan 2017-2020. As concerns **ICT**, in order to accomplish an efficient integration, Central Adriatic Ports Authority has made available

to Ortona the **Port Community System** in use: **PCS LISy.** The PCS is able to interact with the AIDA system of the Custom Agency, with the by PMIS system of Port Authorities Corp and with the TRAMAR system of ISTAT. The new PCS is fully interoperable with the software used by shipping agents and customs agents and it allows the exchange of data relating to the customs process.

Some programming documents of the national and regional transport system include actions with relevant impact on the accessibility of the Port of Ortona. The above mentioned **Regional Integrated Transport Plan** (*PRIT*) foresees some key interventions on the railway network:

- The improvement of the Adriatic railway Pescara-Ortona;
- The modernization and improvement of the Adriatic Sangritana Railway, to strengthen the industrial areas of Ortona.

Besides the main Adriatic line (managed by the national Infrastructure Manager RFI), the railway network of Ortona area is managed by Sangritana railway, which also manages a significant part of the railway network in Abruzzo. The figure 8 shows the railway network of Ortona Area. A further intervention related to Ortona area regards the renovation of the section "Ortona-Caldari" (short light blue line), which links Ortona with the Hinterland.

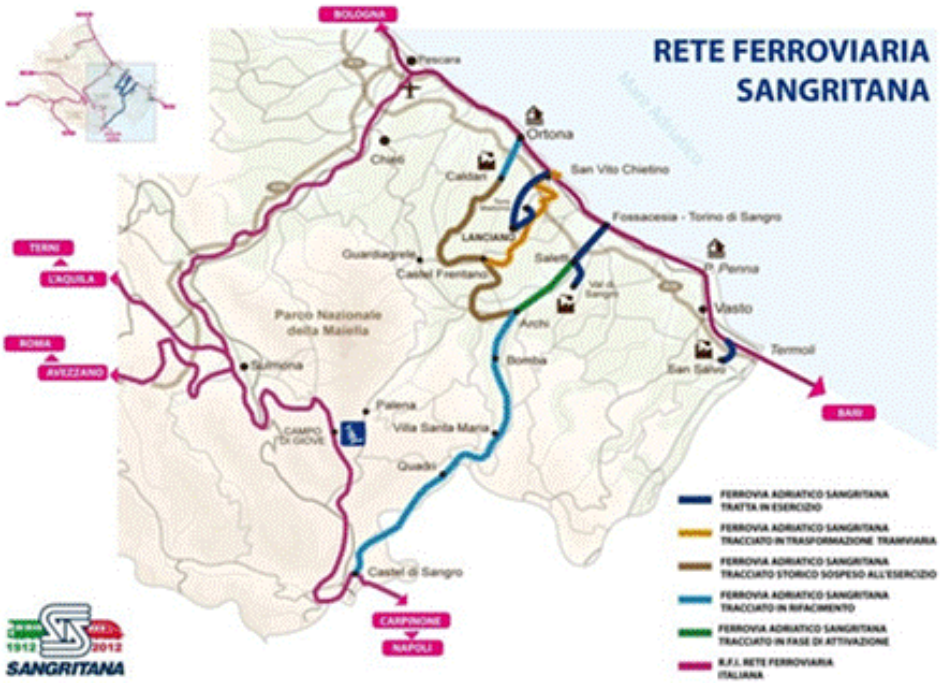

Figure 9: The current railway network and the works in progress in Ortona area by Sangritana Railway (evidenced in blue and light blue. RFI network is showed in purple). (SOURCE: Strategic Development Plan of Abruzzo Region

D.3.2.3-4. Analysis of the physical and non-physical bottlenecks in Italy and Croatia

2019)