Integrated and Sustainable Transport in Efficient Network - ISTEN

DT2.2.2 – Local Action Plan for Ravenna Port

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Responsible Author(s)	Giuseppe Luppino Anna Giarandoni
Contributor(s)	Nicolò Pascale
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1. INTRODUCTION

The main goal of ISTEN project is to qualify ADRION Ports as strategic nodes and hubs for the ADRION Region. This objective is pursued by a mix of synergic actions, which act at local at international level: the definition of strategies, the setting up of local and transnational cooperation network, the drawing up of action plans to improve hinterland intermodal connections, with the scope to foster rail freight transport, moving the freights from road to more efficient and sustainable way.

This action plans aims to transfer the ISTEN approach into specific actions focused on Emilia-Romagna Region and in particular for the Ravenna Port, on the basis of the context analysis and on the transnational exchange of knowledge carried out in WPT1.

Fully in line with the "framework objective" of ISTEN, thus, have been selected two bottleneck clusters on which focusing the identification of key actions aimed at creating the conditions for making the Port of Ravenna and its hinterland an efficient and integrated HUB.

In this document, two of the main obstacles to the development of the connections with port's hinterland are considered: one of them is related to market bottlenecks, in terms of railway flows balancing. The second one concern the infrastructure bottlenecks, in particular the deepening of the draft of the port canal, the expansion of the existing terminals and areas dedicated to logistics operations, and the improvement of the last mile connections.

In fact, the Port of Ravenna was developed early 1960s' to support the industrial development of the Emilia Romagna Region and Northern Italy. Still today the port represents a key node of the logistics chain of the Italian industry in these areas. The strategic relevance of the port is today predominantly related to the import of goods and particularly of raw materials for the Italian industry in Northern Italy. The dredging works under implementation are aimed at keeping the port competitive and consolidate its position in the market with reference to dry bulks and import of raw materials. In order to reach both the target of greening transport, and maximize the potential associated with the availability of a modern and interconnected port infrastructure, thanks to the ongoing investments supported by the TEN-T policy, cross-industry actions towards an increased use of the Port of Ravenna as an export gateway are considered crucial to give concreteness to the strategies.

For these reasons, as detailed in the following sections, various actions and investments have been undertaken in the last years and planned for the next few years.

2. CLUSTER: Market bottlenecks

2.1 Introduction

With reference to the Local Context analysis, the Port of Ravenna serves the excellence industry located in the Emilia Romagna Region and Northern Italy representing a gateway for the dry bulk materials necessary for these industries. Considering the relatively high specialisation of the port and its strong integration with the manufacturing and industrial sectors of the local and national economy, one of the strategies followed to create conditions for innovating and improving the

performance of the port and of its hinterland connections as well as logistics operations, focused on a specific manufacturing sector identified in the ceramic industry.

The regional **ceramic industry** is mainly concentrated within the **"Ceramic District",** a strategic area between the provinces of Modena and Reggio Emilia (Emilia Romagna region) located about 140 km from the **Port of Ravenna,** which concentrates about 82% of the national production of tiles and slabs for flooring and ceramic coatings.

The Port of Ravenna has an important role both in the importation of **raw materials** coming from Ukraine and Turkey, and for the exportation of **ceramic tiles**, especially with Middle East/East-Med countries destinations. Also, transport and logistics activities related to the production and distribution of tiles constitutes an important service operated by the port of Ravenna in favor of the Ceramic District, e.g. the frequent rail connections with the **terminal of Dinazzano**, at the heart of the Ceramic District.

One example of this integrated logistic system is the so-called **"clay train" service**, which operated 900 connections between the two nodes in 2018 for about **1 million tons of raw materials.** The latter, representing one of the main goods categories constituting the rail traffic from the port of Ravenna[1], arrive to Ravenna with direct maritime services from Ukraine and Turkey, then stored and finally transported by means of scheduled trains from Ravenna to Dinazzano.

Regarding instead the connection from the Ceramic District to the Port, it is noticed that the district **exported overseas** via Ravenna Port about **5500 TEUs[2] (corresponding to 120.000 tons)**, reaching the Port of Ravenna mainly by **road transport** (about 90%) and only in small part by **train** (about 10%) usually by means of 20ft. containers. The destination countries for this traffic are, however, limited to some specific areas (East Mediterranean and Black Sea countries, few residual volumes to Middle and Far East).

According to the considerations described above, the Canvas Action Plan (CAP) focuses on the **ceramic sector**, envisaged as strategy for identifying tailored actions addressed to strengthen the relation between the port and the **Ceramic District located in the regional hinterland.**

The defined CANVAS is shown in Annex I and following thoroughly described.

2.2 Stakeholders involved

The stakeholders involved are:

- The Port Authority
- Freight Forwarders
- Port Terminals
- Multimodal Transport Operators (MTOs)
- Sectorial Association

[1] In line with Table **Errore. Solo documento principale.** of the Local Context Analysis report DT1.1.3 " Rail traffic generated by the Port of Ravenna, categorized by type of goods (tons)"
[2] Year 2018; source: ITL Foundation;

More in detail, have been identified 2 port terminals, 1 Multimodal Transport Operator (MTO) and, at last, 8 freight forwarders. The latter, in particular, hold approximately the 78% of the total overseas volumes[3] produced by the Ceramic District industry, confirming the strategic role of their involvement.

One-to-one meetings with representatives of stakeholders of each of the above-mentioned categories were carried out, as indicated in the Table 1 – Stakeholders' meetings, with the aim to investigate:

- Their positioning with respect to the volumes produced by the District with overseas destinations, with a focus on East Med/Middle East target areas;
- Time and costs of transport services (both maritime and terrestrial);
- Drivers for the choice of transport mode;
- Drivers for the choice of the maritime node.

Table 1 – Stakeholders' meetings

Organization	Date of interview
Ravenna Port Authority	18/12/2018
	30/05/2019
	18/06/2019
	15/07/2019
	28/08/2019
	05/09/2019
	19/09/2019
	22/11/2019
	06/12/2019
	11/12/2019
Sectorial Association (Confindustria Ceramica)	30/05/2019
	18/06/2019
	15/07/2019
	28/08/2019
	05/09/2019
	11/12/2019
Inland Rail terminal operator DINAZZANO PO	18/06/2019
	18/11/2019
Port terminal operator SAPIR	18/06/2019
Port terminal operator TCR	18/06/2019
Freight forwarder 1 GENERAL NOLI	15/07/2019
Freight forwarder 2 JAS	28/08/2019
Freight forwarder 3 DEL CORONA E SCARDIGLI	28/08/2019

[3] Source: ITL Foundation analysis.

Freight forwarder 4 LEONARDI GROUP	05/09/2019
Freight forwarder 5 SPINELLI	19/09/2019
Freight forwarder 6 DB SCHENKER	18/10/2019
Freight forwarder 7 DSV	18/10/2019
Freight forwarder 8 TRANSMEC	23/10/2019

Stakeholders also took part in a collective final meeting on the 14th of January 2020, aimed at discussing and defining the actions then included in the present Action Plan.

2.3 Key Actions

Following are given the details of the Key Actions defined with stakeholders.

- **Key Action n. 1:** *Implementation of a new scheduled service by using the "clay train" which currently returns empty to Ravenna Port*

The action consists in the development of a scheduled train service for tiles containers in export by using the existing service devote to the transport of clay (i.e. "clay train)" which currently connects the Port of Ravenna to Dinazzano terminal about 20 times a week (4 connections/day), returning empty (only occasionally some wagon containers are added).

After a preliminary assessment with the rail cargo operator based at the Dinazzano terminal, operational conditions (in terms of equipment and operational feasibility and availability) have been evaluated in detail. According to this consultation, have been supposed that up to 10 additional wagons for containers can be added to the returning clay train allowing to transport to Ravenna additional 20ft. containers per train. In total, a new service with guarantee the transport of 4.000 TEUs/year, partially covering the **existing demand** (it estimated that about 5000 TEUs of ceramic tiles reach Ravenna by truck each year).

The service allows a strong impulse to modal shift enabling the rail service to be always more convenient and attractive if compared to road alternative, because of a reliable scheduling and an increased frequency that would generate an additional demand ("critical mass").

It is important to underline that the action is subject to the stipulation of **commercial agreements and strategies** between commercial stakeholders (i.e. freight forwarders and transport operators) involved in the maritime and hinterland logistics chain, aimed at **consolidating a proper critical mass**.

The consolidation of an additional demand in terms of tiles containers dedicated to overseas export via Ravenna, would enable the conditions to reduce carriage costs per single container.

Nonetheless, the service could also apply for Regional incentives for the modal shift (generally awarded every three years), allowing a total saving of about 23 Euro/container (on a total estimated cost of 300 Euro/container).

- **Key Action n. 2:** *Commercial actions for the development of new connections and the strengthening of existing feeder services.*

The action consists in a new commercial strategy of the Port with the objective to involve shipping lines in order to verify the possibility to implement new direct connections and services as well as strengthen the existing ones.

Considering the sector of Ceramic tiles industry, the primary role covered by the Port of Ravenna in accommodating needs in terms of demand mainly occurs towards East Med destinations, as only indirect connections to Middle East and Far East are possible and one or more transshipments are required, with the consequent issues related to increased costs, transit times and risks (damage to goods and missed correspondences at the port of transshipment in case of delays). This situation, clearly, brings to the consequence that Transport companies may chose different departing Ports as more competitive to Middle East and Far East destinations.

The creation of new dialogues with shipping companies is enabled by the involvement of stakeholders (in particular Port Authority, Port Terminal companies and Freight Forwarders) and takes into account the possibility to include economic facilities. The latter point is justified according to the fact that is given the assumption that new shipping lines services can generate additional demand and improve port cargo volumes. Aiming, then, for an increase in the port attractiveness both for the hinterland and for countries markets (especially Middle East markets but also new markets such as Far East), it is searched for more competitive services and optimal balancing between transit times and costs.

2.4 Aims

The aims of the implementation of the Key Actions consist in:

- Consolidating the existing relations between the Port and its hinterland nodes by means of an improved port attractiveness and competitiveness within the Mediterranean Sea basin, as well as within the Northern and Central Italian intermodal system.
- A further increasing the traffic volumes at the port as part of its hinterland logistics chain with reference to total traffic and internodal traffic, including an increase in the modal share of rail traffic accessing the ports' terminals.

2.5 Problems faced

After consultations with stakeholders, resulted the following problems/criticalities:

- **Difficulties encountered in the railway flows balancing**

In consideration of the rail transport, raw materials for the ceramic industry reveals as one of the products determining unbalanced train services in terms of incoming and outcoming volumes, as also shown by the Table 2 of the Local Context Analysis report (DT1.1.3), hereafter recalled.

Table 2 - Rail traffic generated by the Port of Ravenna, categorized by type of goods (tons) – 2016 data

Goods type	Incoming [tons]	Outgoing [tons]	Total [tons]
Chemical	106,730	76,132	182,862
Metallurgical	-	1,605,259	1,605,259
Raw material for ceramics	168,231	1,021,569	1,189,800
Cereals	-	161,028	161,028
Ferrous	-	5,308	5,308
Rapeseed oil	4,885	-	4,885
Containerised	140,560	78,388	218,948

Total	420,406	2,947,684	3,368,090
TEUs	10,659	11,515	22,174

The numbers reflect the service represented by the **"clay train" services**, transporting about 1 million tons/year returning **empty** to Ravenna. Viceversa, containerized rail services running between Dinazzano and Ravenna are infrequent and, moreover, are unscheduled, allowing road transport to be more reliable and attractive for freight forwarders. Needless to say, this condition leaves space to actions aimed at optimizing the system of relationships between the port and its hinterland chain. Nevertheless, the implementation or planning of a regular service is strictly related to the availability of a certain, constant demand in order to ensure the economic sustainability and efficiency production of the rail service.

- **Difficulties to offer a competitive service in relation to infrastructure bottlenecks**

Rail Infrastructure for accessing to Ravenna port is limited and trains are subjected to double shunting (one at the Ravenna passenger station, and the other at the terminal), determining increased times and costs which affect the competitiveness and efficiency of the intermodal transport choice, in favor of the road transport by truck.

- **Complex governance of the transport service providers**

From the meetings with stakeholders resulted that a consistent part of export volumes is not managed by freight forwarders but is directly managed by shipping lines. The latter cover an always stronger role in the supply chain in relation to the selling of "carrier haulage" services. In this sense, the terrestrial transport is generally given to MTOs at a flat rate and the choice of the outgoing port is frequently in favor of the Tyrrhenian ports.

- **Fragmentation of logistics forwarders**

Exportation process is complex is handled by many different actors: freight forwarders, shipping lines, MTOs; this fragmentation inhibits the possibility to consolidate a critical mass to activate scheduled train services and optimization in the logistic system.

- **Difficulties related to the existing trade terms (INCOTERMS)**

The ceramic production in the District is characterized by a strong export orientation and deliveries are managed EXW ("ex -works"). In this sense, the industry does not occupy of logistics of the exported product, but only have attention on the supply of raw materials. Freight forwarders and shipping lines are the main actors of the tile's logistics.

2.6 Timescale implementation

As reported in Table 3, the Action no. 1 is currently ongoing and Action no. 2 is currently ongoing but, being a longer process, its implementation is foreseen to be completed in the mid-term.

Table 3 – Timescale implementation for the identified actions

	Short term (by 2020)	*Mid-term (by 2027)*	*Long term (by 2034)*
Key Action 1	Beginning and completion of Key Action 1		
Key Action 2	Beginning of Key Action 2	Completion of Key Action 2	

2.7 Risk evaluation

The first main risk connected to the implementation of the Actions, especially Key Action n. 1, is related to the realization of new train services (so-called "train risk"), which is related to their capability to enter the market attracting enough critical mass demand to sustain their operating costs. The risk is estimated as "low", in consideration of the fact that the feasibility analyses have been elaborated on the basis of the existing, not incremental, demand.

Additionally, risks related to long term sustainability of the Actions n. 1 and n. 2 are evaluated as "low-medium", in consideration of the limited duration of regional incentives for the modal shift (3+2 years), however mitigated by the increasing demand enabling lower costs for rail transport (virtuous circle).

2.8 Funding sources

- ***Key Action 1***

The funding sources for Key Action 1 are partially private (MTOs/ Railway operators which make investments and fully absorb the "train risk" + the ceramic industry, who can financially contribute to promote sustainability and modal shift initiatives) and partially public (Regional/State incentives for modal shift (e.g. L.R. 30/2019, Ferrobonus).

- ***Key Action 2***

The funding sources for Key Action 2 are private (Maritime/port terminals, Inland rail terminals/MTOs).

2.9 Impact on Bottlenecks

Continuous consultation with stakeholders is foreseen during the implementation of the Actions, in order to monitor and evaluate the activities included in the Action Plan:

- Increase in the incoming and outcoming volumes (tons) of raw materials/ceramic tiles, over a timescale of 1 year after implementation of the new service, and their variation compared to the previous year.
- Number of trains (inbound and outbound) connecting the port of Ravenna with the ceramic district for raw materials/ceramic tiles over a timescale of 1 year, their variation compared to the previous year.
- Improved integration of the Northern-Central Italian regions with the Adriatic Ionian basin and the TEN- T network (Baltic Adriatic).
- New connections/new shipping lines/new markets (N.) supplied by the Port of Ravenna.
- Travel time and distance (hours; km) of train services connecting the Port of Ravenna and Dinazzano, in relation to their difference in case of none, one or two shunting maneuvers.

Indicators can be evaluated since the beginning of the activities (time 0), during the implementation of the actions and at the total completion of the actions.

2.10 Annex I – CANVAS Action Plan

Stakeholders involved	Key Actions	Aims	Problems faced	Timescale implementation
• Port Authority of Ravenna • Tiles industry/ Sectorial Association (Confindustria Ceramica) • Maritime Terminal operator (TCR, SAPIR) • Rail Terminal Operator (Dinazzano Po) • Freight Forwarders	1 - Implementation of a scheduled service by using the "clay train" which currently returns empty to Ravenna (only occasionally some wagon containers are added). 2- Attraction of new shipping lines for improving the Port attractiveness (new connections), direct or with reliable transshipment connections; strengthening of the feeder services.	• Improved port attractiveness and competitiveness • Increased traffic volumes at the port	• Difficulties encountered in the railway flows balancing • Infrastructure limitations • Complex governance of the rail service providers • Fragmentation of operators • Difficulties related to the existing trade terms (INCOTERMS)	• Beginning and completion of Key Action 1 is foreseen by 2020 (Short term) • Beginning of Key Action 2 is foreseen by 2020 (Short term), its completion is foreseen in the mid term (by 2027)
Funding sources • Private funding • Regional grants to support the modal shift to rail in the region			**Risk analysis** • Train cost - business risk distribution • Long term sustainability	

3. CLUSTER: Infrastructure bottlenecks

3.1 Introduction

With reference to the Local Context analysis, maintaining an efficient and effective infrastructure capable of serving the needs of the market and accompany the evolution of the port and maritime industry is still a key element to keep a port competitive, especially in the mid and long-time horizons.

Among the actions aimed at promoting the integration between the Port and its Hinterland surroundings, and with international networks (TEN-T and Adriatic-Ionian basin), find place the infrastructure bottlenecks affecting the freight transport and logistics operations at the Port of Ravenna. In particular, bottlenecks are related to the deepening of the draft of the port canal, the expansion of the existing terminals and areas dedicated to logistics operations, but also the improvement of the last mile connections.

Starting with the port infrastructure development and expansion projects, activities are already ongoing which relate to the deepening of the Candiano Canal, currently constrained by a low draft which limits the efficiency of the terminal operations to all types of cargo, and particularly dry bulks. The relatively limited depth of the access canal, whose maximum draught is 10.5 m, and of the quays, in some of which (some of the mains) the draft is limited to just above 9 m, is suitable to those ships whose dead-weight tonnage (DWT) is lower than 20-25 thousand tons (approximatively the segment of the Handysize ships), corresponding to around 30% units (10% if measured in DWT) of the world fleet. The use of bigger ships is subjected to a reduction of the maximum permissible load, which can be achieved through a prior unload to a different port. Such constraint reduces the transport efficiency and increases the related costs, with a negative impact on the competitiveness of the Ravenna Port.

3.2 Stakeholders involved

The main stakeholders involved are:

- Emilia-Romagna Region
- RFI S.p.A. - National Rail infrastructure manager
- Ravenna Municipality
- Ravenna Port Authority
- Inland Rail terminal operator Dinazzano Po
- Port terminal operator SAPIR
- Port terminal operator TCR

In particular, the followed steps have been followed:

- Signature of two Memorandum of Understanding in 2009 and 2013 (between the Municipality, the Region, RFI SpA, FS Sis. Urb. and Ravenna port Authority) for the urban reorganisation of

the railway station and its surroundings in which are highlighted the bottlenecks related to the conflict between urban viability and rail access to the port;

- Signature of the Implementing Protocol and the related Operating Agreement in 2015 and 2017 (between Emilia-Romagna Region, Ravenna Municipality, Ravenna Port Authority and RFI SpA) for the implementation of interventions to improve the rail accessibility of the port - overcoming the critical issues of interference between the roads and the port's rail facilities. In this frame, the projects were agreed and carried out between the public bodies - which has speeded up approval times.
- Signature, in 2018, of a further Protocol for the improvement of rail accessibility and strengthening of the rail infrastructure serving the port. The Protocol defines a complex set of interventions which will allow the elimination of the maneuvering operations in the Port Freight Terminal in order to increase capacity and reduce lead times.

3.3 Key Actions

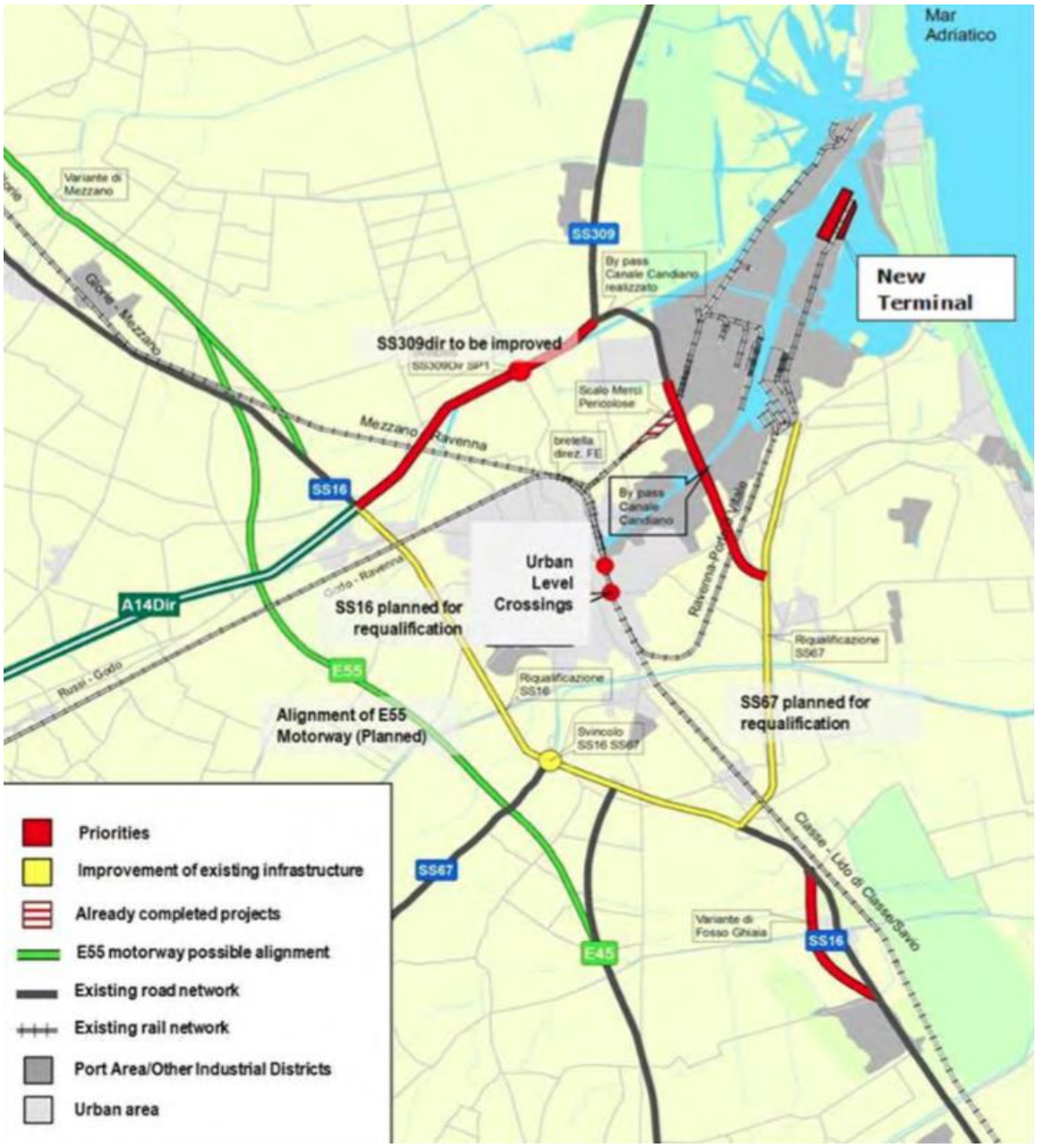
Following are given the details of the Key Actions defined with stakeholders.

- **Key Action n. 1: Renovation of rail/road infrastructure and services for the accessibility of the Ravenna Port**

The action consists in the resolution of the scarce accessibility to the port and last mile connections to the ports' terminals which affect the transport time, costs and thus the **overall attractiveness of the Port** in favor of other contenders Ports. Moreover, this is also a priority for the new TEN-T policy, the Work Plan of the Baltic-Adriatic corridor, the Deployment Plan for the Motorways of the Sea as well as the Connecting Italy (Connettere l'Italia) strategy, and the Strategic National Plan for Ports and Logistic (Piano Strategico Nazionale dei Porti e della Logistica).

Accessibility to the port results in both road and rail connections, as indicated in the Figure 1.

Figure 1 - Port last mile connections



- **Rail connections**

A series of specific projects have been identified and some of which are also already under implementation for the improvement of last mile connections in the wider context of the initiatives related to the development of the Core Network Corridor rail infrastructure in line with the standards required by the Regulation EU 1315/2013. To achieve this latter objective, the investments planned by the Italian national railway infrastructure manager, RFI, foresee numerous interventions relating to the adjustment of the gauge, the length and the axle load of the railway

lines interconnecting the port with the main logistics nodes located in the Emilia Romagna Region and more generally in the catchment area of the port.

About rail last mile connections, the objective is again to ensure the ports and their terminals respect as far as possible the technical standards in terms of:

- Electrification;
- Gauge;
- Axle load;
- Train length.

Furthermore, there is the need to upgrade and further develop the existing rail infrastructure within and in the immediate surroundings of the port areas. Improvements are required also in view of future traffic increase. The following issues have been recognized:

- Freight terminal close to its capacity limit;
- Interference with passenger train station;
- Low speed and long travel time to port terminals;
- Road – rail interference: level crossings (no barriers);
- Unavailability of hazardous cargo yards.

In this framework, five planned works are included in this action:

- eliminate one level crossing on the line interconnecting the port to the Baltic-Adriatic corridor network
- upgrade to P/C 80 standard the link on the Teodorico bridge and extend the existing infrastructure on the right side of the port canal, reaching the new container terminal.
- Additional upgrading and improvements of the existing infrastructure are also planned.

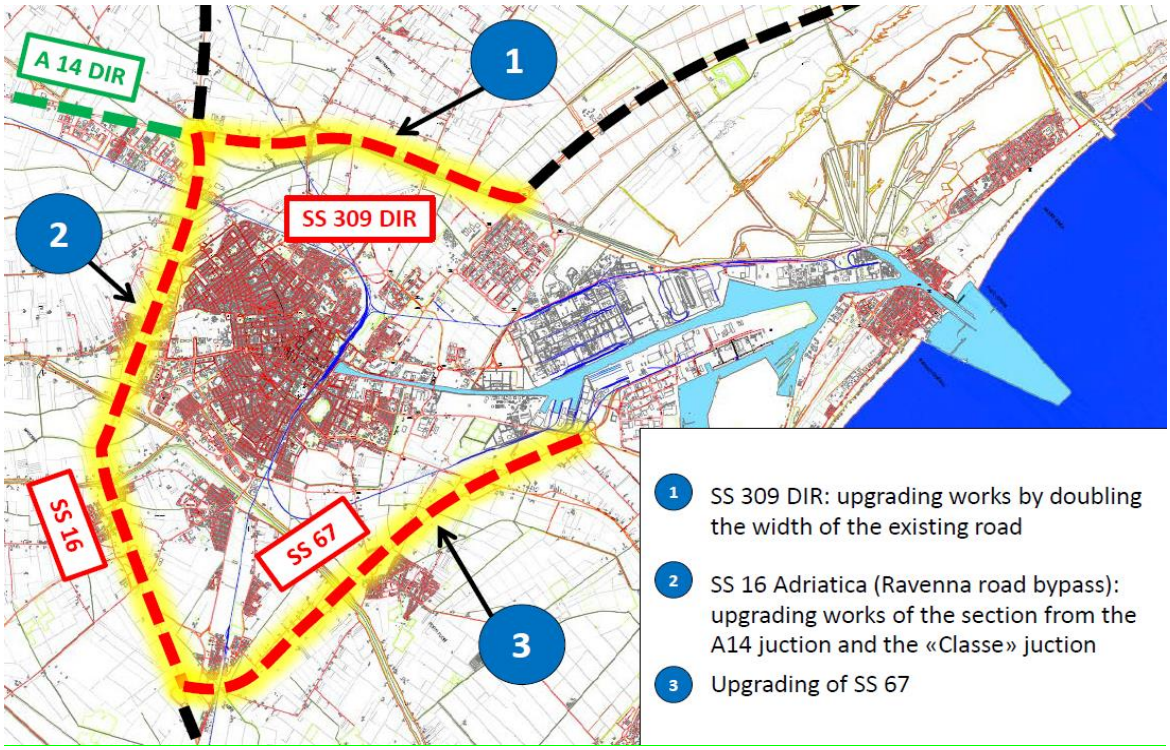
Table 4 - Planned improvements of the rail network within the Port of Ravenna

Number	Description
1	Elimination of a level crossing (Via Canale Molinetto)
2	Teodorico Bridge: Upgrading to P/C80
3	Extension of the shunting track to the new container terminal
4	Strengthening of the North shunting track: • upgrade of the rail yard to freight terminal; • direct link to North bound main line into operation.
5	Strengthening of the South shunting track: • electrification and equipment of the track; • upgrade of the rail yard to freight terminal.

❖ **Road connections:**

Regarding road last mile connections, as the road infrastructure requires modernization, the national planning envisages interventions for the upgrade of the Ravenna's ring road, which shows criticalities in relation to the peak traffic volumes in summer months, particularly on those sections that distribute the traffic coming from the A14 dir between the North and the South area of Ravenna. Moreover, solutions to mitigate the impact of road transport on the respective urban areas are also needed.

Table 5 - Road sections interested by the planning upgrades



More in details, are foreseen:

- Works for the improvement of road accessibility to the port are also planned for the upgrade of the SS 309 dir and its interconnection to the SS 16
- Upgrade of SS 16;
- the improvement of the SS 67 (included in the current Framework Agreement between the Italian Government and the National Highway Agency).
- Improvement of the Cesena-Ravenna-Mestre highway interconnecting Venezia to Ravenna, to Rome. This project is currently under consideration, assumed to be possibly developed under a PPP scheme.

- **Key Action n. 2: Maritime-side infrastructural improvements for canal depth, new terminals and quays (Ravenna Port Hub project)**

This action consists in the implementation of the Ravenna Hub Project, aimed at resolving the bottleneck consisting in limited maritime infrastructure, as well as guaranteeing port competitiveness.

The first stage of the Ravenna Port Hub project (Figure 2), already under implementation, includes dredging the canals (marine, Candiano and Baiona) and the front port area, reaching a maximum draft of 11.8 m (+1m). This improvement will allow the access of full loaded vessels with 30-35 thousand tons, which corresponds to load capacity that is 50% higher than the current limit. This stage also envisages the upgrade of the existing quays and the construction of the New container/multipurpose terminal quay, as well as the re-use of dredged materials to raise the level of areas located in the proximity of the port, in order to develop them as logistics platforms.

The second stage of the project (

Figure 3), instead, foresees a draft of -12,50/-14,50 meters in the superior parts of the Port, and up to -15,00 m in the approaching canal.

Figure 2 - Stage I of the Ravenna Port Hub project

Figure 3 - Stage II of the Ravenna Port Hub project

3.4 Aims

The Aims of the implementation of the Key Actions consist in:

- Consolidating the existing relations between the Port and its hinterland nodes by means of an improved port attractiveness and competitiveness within the Northern and Central Italian intermodal system.
- A further increasing the traffic volumes at the port as part of its hinterland logistics chain with reference to total traffic and internodal traffic, including an increase in the modal share of rail traffic accessing the ports' terminals.
- Improved port attractiveness and competitiveness within the Mediterranean Sea basin, overcoming the possible progressive marginalization of the seaport due to the increasing vessel size of the word fleet and the existence of higher drafts available in other European ports that register dry bulks traffic volumes higher than 10 million tons.

3.5 Problems faced

The main problem faced results in the long and complex implementation timeplan, e.g. caused by joint design activities, consultations with stakeholders, administrative, financial and legal procedures (tenders, contracting, etc.), as well as the issue related to the matching of the priorities between timescale for the implementation of the actions with the available financial resources.

3.6 Timescale implementation

In line with the local context analysis, the timeplan for the implementation of described actions for future development of the Port of Ravenna is expected to be as follow (Table 6):

- Key Action n. 1: The completion of the works for rail last mile connections to the ports' terminals is foreseen in the Short Term (2020); the completion of the works for the improvement of road last mile connections is foreseen in the Medium Term (2027).
- Key Action n. 2: the tender procedure aimed at identifying one general contractor has started in November 2019, the awarding of the tender is foreseen for late Spring 2020 and then the beginning of the works of Stage 1 is expected for Summer 2020. The beginning of the Stage 2 is foreseen in the medium term (by 2027) and its completion in the Long term (by 2034).

Table 6 – Timescale implementation

	Short term (by 2020)	***Mid-term (by 2027)***	***Long term (by 2034)***
Key Action 1	Completion of the works for rail last mile connections to the ports' terminals	Completion of the works for the improvement of road last mile connections	
Key Action 2	Beginning of the works related to Stage 1	Completion of the works related to Stage 1 – Beginning of the works related to Stage 2	Completion of the works related to Stage 2

3.7 Risk evaluation

The only risks (in part already experienced) are associated to delays in the final design of the project, longer consultation with stakeholders, as well as to the lack of funding for all the envisaged activities.

3.8 Funding sources

- ***Key Action 1***

The funding sources are public (State/EU funds). More in detail:

- the works for the improvement of rail accessibility (considering the interventions listed in the section "Key Actions" are quantified in about 70 € million (RFI SpA);
- the works for the improvement of road accessibility to the port are quantified in about 175 € million for the upgrade of the SS 309 dir and its interconnection to the SS 16, about 72 € million for the upgrade of the SS 16; €20 million for the improvement of the SS 67 (included in the

current Framework Agreement between the Italian Government and the National Highway Agency).

- ***Key Action 2***

The funding sources are public (State/EU funds) and correspond to about 235 € million. In particular, a part of the amount was awarded with CEF funds (2017-IT-TM-0044-W) for an amount of about 37 € million.

3.9 Impacts on identified bottlenecks

The first main impact related to the realization of the Ravenna Port Hub project will allow to keep the port competitive and to overcome the possible progressive marginalization of the seaport due to the increasing vessel size of the world fleet and the existence of higher drafts available in other European ports that register dry bulks traffic volumes higher than 10 million tons.

The main impacts related to a disruptive improvement of port accessibility and the development of an "integrated network" between maritime infrastructure and land-based infrastructure, results in an increase in the total traffic throughput of the port and the hinterland logistics chain with reference to total traffic and intermodal traffic, including an increase in the modal share of rail traffic accessing the ports' terminals.

The impacts related to accessibility have also an indirect impact on the overall competitiveness of the port-hinterland system. At last, the enhancement of this infrastructure is expected to provide an improved environmental performance of the local logistics chain in terms of decrease of road traffic in favor to the rail mode of transport, as well as a reduction in the travelled distances for the road freight transport addressed to the Port. In this way, it is allowed to prevent or reduce the negative externalities related to road transport, such as GHG and noise emissions, while at the same time accommodating growing demand.

Indicators are being evaluated since the beginning of the activities (time 0), during the implementation of the actions and at the total completion of the actions.

3.10 Annex I – CANVAS Action Plan

<table>
<tr>
<td>Stakeholders involved

• Emilia-Romagna Region
• RFI S.p.A. - National Rail infrastructure manager
• Ravenna Municipality
• Ravenna Port Authority
• Inland Rail terminal operator Dinazzano Po
• Port terminal operator SAPIR
• Port terminal operator TCR</td>
<td>Key Actions

• Key Action n. 1: Renovation of rail/road infrastructure and services for the accessibility of the Ravenna Port
• Key Action n. 2: Maritime-side infrastructural improvements for canal depth, new terminals and quays (Ravenna Port Hub project)</td>
<td>Aims

• Consolidating the relations between the Port and its hinterland and increase of the Port attractiveness and competitiveness
• Increase in the traffic volumes at the port as part of its hinterland logistics chain
• Improved port attractiveness and competitiveness within the Mediterranean Sea basin</td>
<td>Problems faced

• Long and complex implementation timeplan, e.g. caused by joint design activities, consultations with stakeholders, administrative, financial and legal procedures (tenders, contracting, etc.)
• Matching the priorities between timescale for the implementation of the actions with the available financial resources.</td>
<td>Timescale implementation

Key Action 1:
• Completion of the works for rail last mile connections to the ports’ terminals - Short term (by 2020)
• Completion of the works for the improvement of road last mile connections - Mid-term (by 2027)
Key Action 2:
• Beginning of the works related to Stage 1 - Short term (by 2020)
• Completion of the works related to Stage 1 + Beginning of the works related to Stage 2 - Mid-term (by 2027)
• Completion of the works related to Stage 2 - Long term (by 2034)</td>
</tr>
<tr>
<td colspan="3">Funding sources

• Government allocations (RFI)
• State funds
• Regional funds
• EU funds (CEF)</td>
<td colspan="2">Risk analysis

• Lack of funding
• Delays in joint project designing
• Delays in consultations with stakeholders</td>
</tr>
</table>

4. CONCLUSIONS

This Action Plans wants to contribute to overcome the bottlenecks identified at both local and transnational level and according to ISTEN's vision supporting Ravenna seaport towards the development of an integrated hubs network at ADRION level.

The port hinterland is increasingly recognised as the place for future competition of ports. It is a driving factor in port development dynamics, in this perspective the port development overtakes the port perimeter in a higher geographical scale. The future development at the Port of Ravenna will be influenced by global market evolutions as well as infrastructure, innovation and industry developments which are hardly predictable, but the actions mentioned in the chapter above strengthen the Port of Ravenna into synergic prospective. First of all, the port infrastructure developments, such as dredging of the port canal and development of new quays and terminals is considered an essential determinant of the future success of the port as the current port characteristics are deemed to represent a critical barrier to keep this node competitive against the challenges imposed by industry global trends. In addition, positive element is represented by the increased capacity of the stakeholders of the port and its hinterland to promote the use of this node as a gateway for the industry served by the port in Northern Italy, not just for import, but also for export purposes. The creation of ER.I.C. Emilia-Romagna Intermodal Cluster in 2018 following a cooperation agreement signed between Ravenna Port Authorities and 7 of the main transport and logistic platforms involved in ensuring intermodal services in the area, is tangible proof of the effort provided to enhance the intermodal regional community system. In particular, the main scope is to offer modern and efficient logistics services to the clients involved in the wider logistics chain of the flows of import and export goods generated by the Italian industry. Finally, innovative solutions in terms of business and organisational concepts, IT infrastructure and facilities and equipment enabling automated port-hinterland processes, together with the possible development of logistics areas in the proximity of the port, is also considered key to enhancing the attractiveness of the port and support the use of this node also for export purposes.

This action plan is strongly related to a regional planning document, namely PRIT (Piano Regionale Integrato per i trasporti) and to the standards required by European legislation regarding railway infrastructure (according to the Ten-T guidelines). In fact, Emilia-Romagna region is the core of the main corridors between the north and south of the Country. The port of Ravenna and its catchment area occupy a central role in the transport and logistics context of the region, being inserted in the regional, national and European transport planning documents.

The interventions inserted in the regional planning documents will allow to improve the connections of the port of Ravenna with its hinterland and with the great part of the potential national catchment area, improving at the same time the multimodal transport system of the port.

Together with the Global project, aiming at: dredging the port canal, upgrading the quays and developing new multimodal platforms, other physical interventions are planned to improve the efficiency of the multimodal transport in the node. These three interventions are necessary to adapt the railway connections of the port of Ravenna to the standards required by European legislation regarding railway infrastructure (according to the Ten-T guidelines).

The measures included in this LAP, especially those focusing on the Intermodal connections to the hinterland are also fully in line with key macroregional strategies document. In particular the last document delivered, the *Action Plan of the Strategy for the Adriatic-Ionian Region* (EUSAIR), suggested actions referred to increase access to rail terminals, in particular in sea and inland ports, introducing a concession approach for infrastructure, with direct cost oriented track access charges, performance schemes and management contracts for authorised applicants.