

Strategic analysis for Italian Territorial Needs Assessments”

D.3.2.10

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1. Introduction

On the basis of Deliverable D.3.2.1: Methodology for the implementation of Territorial Needs Assessments (TNA) prepared by WP Leader, this report aims to analyse the territorial needs for Italy.

The deliverable D.3.2.10 "Strategic analysis for Italian Territorial Needs Assessments" is based on the methodology outlined by the deliverable D3.2.1 "Methodology for the implementation of Territorial Needs Assessments".

2. Transport planning in Italy

2.1 The European transport network policy (TEN-T and CNC) in Italy (Reg. 1315/2013 and 1316/2013)

The European policy for Trans-European Networks (TEN) for transport, energy and telecommunications was established in 1993 on the basis of Title XVI, Articles 170-172 of the Treaty on the Functioning of the European Union. They enable the internal market to function, linking European regions and connecting Europe with the rest of the world. The creation and development of TEN aim at the interconnecting each national infrastructure networks by ensuring their interoperability with actions based on the establishment of common standards for the removal of technical barriers.

At the beginning of the 1990s, the 12 Member States had decided to set up a transport policy at European level in order to support the functioning of the internal market through continuous and efficient networks in the fields of transport, energy and telecommunications. After 20 years there have been major developments and challenges affecting the issues: the geographical extension as a result of four enlargements, Europe's increasing responsibility at global level, "revolution" in the field of Information and Communication Technologies, all had an impact on European infrastructure development. With a view to the EU's financial framework 2014–2020, the European Commission launched a policy review in 2009. The review started with an analysis of the strength and weaknesses experienced so far, built on the advice of technical experts and involved a broad range of stakeholders through formal consultations and regular TEN-T Days. The new policy framework, which was established as a result of this review, brought innovations and significant progress in a number of areas: governance at European level, a strong legal form, a genuine network approach, a powerful instrument for TEN-T funding, etc.... Today, the priority at European level is to ensure the continuity of the corridors, solve the missing links, and ensure connections between the different modes of transport, eliminating the existing bottlenecks.

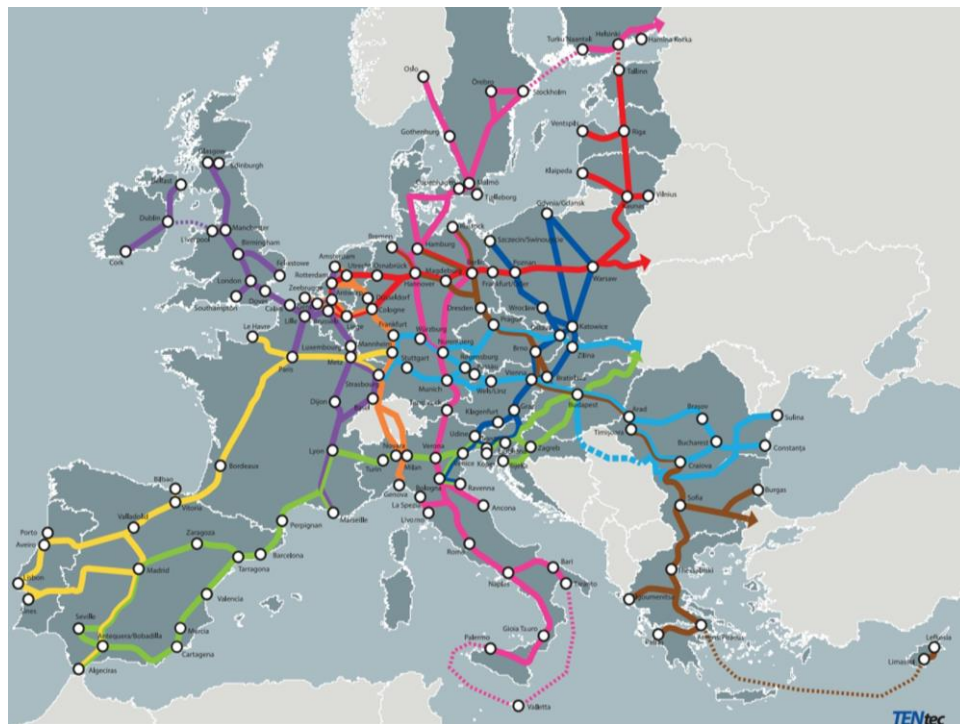
The main references of this paragraph are then the 2011 White Paper "Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system" (COM/2011/0144), adopted by the European Commission in 2011 and Regulation EU nr. 1315 and 1316/2013. The first document outlined a wide-ranging policy aimed at making the transport system competitive, able to increase mobility, remove the main obstacles in the essential areas, and boost growth and employment. By 2050 one of the key goals of the White Paper include a 50% shift of medium distance intercity passenger and freight journeys from road to rail and waterborne transport. Within the scenario outlined by the White Paper, with Regulation 1315/2013 of the European Parliament and of the Council of 11 December 2013, the EU reviewed the TEN-T networks establishing its development guidelines according to a "double-layer" structure:

- a core network, of greater strategic importance for the EU internal market, to be completed by 2030.
- a comprehensive network to be completed by 2050.

Both are multimodal transnational networks (rail, road, ports, airports, waterways) which interconnect themselves to create a dense network between the different European regions and between the main nodes of it. The aim of the network is to increase the efficiency and sustainability of transport systems, their capacity to contribute to the cohesion of territories and communities and to improve mobility services and their accessibility to travellers and goods.

Within these two networks, and specifically for the implementation of the core network, nine multimodal Core Network Corridors (CNC) have been identified.

Figure 1 - EU TEN-T network and CNC's



Among these nine Corridors, four of them are partially located in Italy:

- **Scandinavian Mediterranean Corridor** covers from the Russian-Finnish border and Finnish ports of Hamina/Kotka, Helsinki and Turku and crosses, with a section from Oslo, Southern Sweden, Denmark, Germany (connections with the ports of Bremen, Hamburg and Rostock), Western Austria, Italy (connections with the ports of La Spezia, Livorno, Ancona, Bari, Taranto, Naples and Palermo) and reaches Malta. The corridor includes railways, roads, airports, ports, rail-road terminals (RRTs) and sections of the motorway of the sea. The main projects within this corridor are at the moment the fixed connection of the Fehmarn Belt in the Northern section and the Brenner Base Tunnel in the Southern section involving directly our Country.

- Mediterranean Corridor** connects the ports of Algeciras, Cartagena, Valencia, Tarragona and Barcelona in the Iberian Peninsula, with Hungary, passing through the south of France, northern Italy and Slovenia, with a section in Croatia. The corridor includes railways, roads, airports, ports (Venice and Trieste) and rail-road terminals (Torino, Novara, Verona, Padua, Cervignano) and, in northern Italy, also the inland waterway constituted by the river Po. The main projects of the corridor are the UIC standard gauge railway lines in Spain, the Turin-Lyon railway tunnel and the Trieste/Capodistria-Ljubljana connection through the Karst region.
- Baltic-Adriatic Corridor** encompasses from the Polish ports of Gdansk, Gdynia and Szczecin/Swinoujscie and, passing through the Czech Republic or Slovakia and eastern Austria, reaches the Slovenian port of Koper and the Italian ports of Trieste, Venice and Ravenna. The corridor includes railways, roads, airports, ports and rail-road terminals (RRTs). The main projects are the Semmering base tunnel and the Koralm railway line (Graz-Klagenfurt) in Austria.
- Rhine-Alpine Corridor** connects the ports of the North Sea and the Italian port of Genoa crossing the Rhine valley, Basel and Milan. The corridor includes railways, roads, airports, ports, rail-road terminals and the Rhine river as inland waterway.

Figure 2 - TEN-T Network in Italy



In addition to the above-mentioned Core Network Corridors, it seems useful to remind that, according to Annex I Part. I chapter 1. of UE Reg. 1316/2013, the European transport planning foresees also the development, through dedicated budget allocation, of the transport “horizontal priorities” in Member States such as Innovative management & services (SESAR, RIS, VTMISS, ERTMS and ITS), Motorways of the Sea programme, Safe and secure parking and new technologies and innovation in transport.

2.2 The Annexes to the Economic and Financial Document (Documento Economia e Finanza – DEF)

The Economic and Financial Document (Documento di economia e finanza - DEF), pursuant to law n. 39 of 7 April 2011, is submitted to Parliament no later than 10 April of each year. It is the main instrument for financial and economic planning, as it sets out the public finance and economic strategies for the mid-term. It is submitted by the Government and approved by the Parliament. It embeds three sections and several annexes.

Among these annexes there is the “Infrastructure Annex – Allegato Infrastrutture”, stating transport strategies and objectives, infrastructure requirements and main infrastructural projects.

2.2.1 Allegato Infrastrutture al DEF 2109

The latest “Allegato Infrastrutture”, issued in May 2019, provides the most recent framework on transport and logistics national strategies.

The definition of the strategic guidelines, also in terms of transport infrastructures, is based on an extensive analysis of the territorial needs, that could be synthetically enumerated in the completion of the missing links, on passenger and freight safe mobility improvement, on environmental sustainability, improvement of commuters mobility and enhanced accessibility for economic competitiveness.

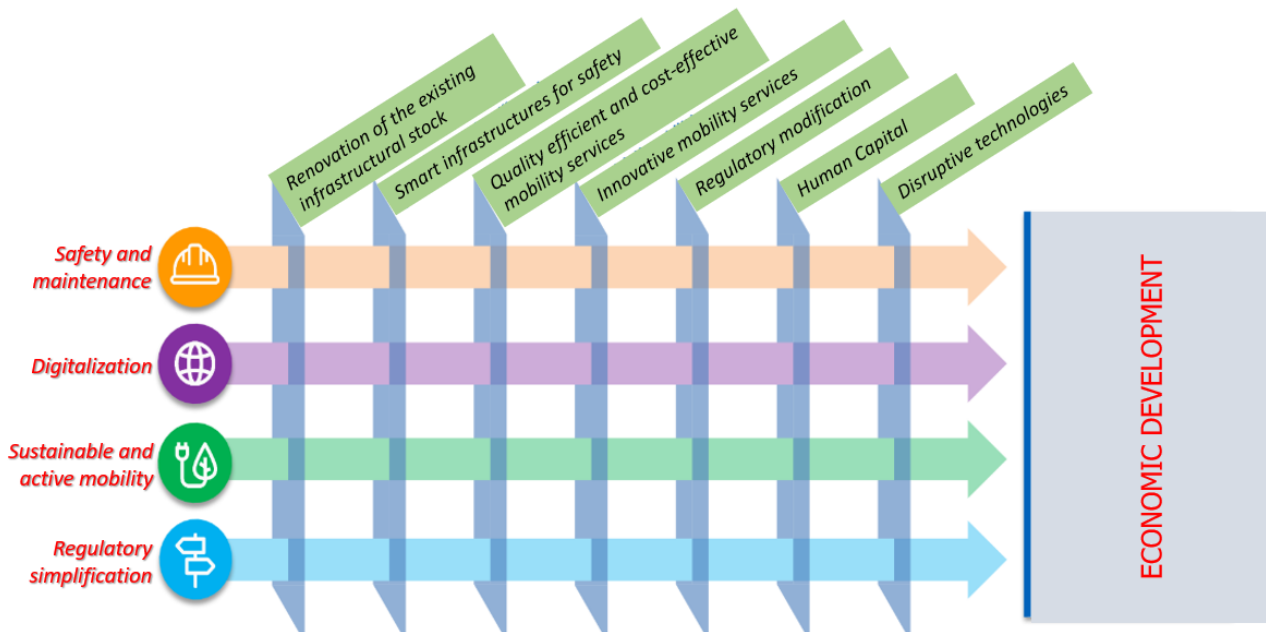
Having said that, the document identifies 4 main strategic pillars in order to pursue the above-mentioned general objectives:

- Safety and Maintenance infrastructural programmes, by paying particular attention to the safety aspects for the ordinary mobility, through the implementation of an extraordinary maintenance programme and the preservation and enhancement of the existing infrastructural stock;
- Digitalization and Innovation, through the establishment of a governance process able to ensure a full development of the digital transformation currently undergoing in the transport sector and in the business model of the market operators;
- Alternative Mobility: promotion of new mobility means and new mobility services, also by planning the development of the electric mobility in the urban nodes through agreements with the infrastructure managers;

- Simplification of the regulatory framework by defining a smooth and clear legislative environment for the realization of the infrastructural works, for the development of innovative mobility services and the data standardization.

Moreover, the implementation of those strategies is designed to be reached through the establishment of several horizontal tools as graphically described in the figure below.

Figure 3 – National Strategies and implementing tools in transport planning 2019



2.2.2 Connecting Italy (Connettere l'Italia)

Since 2016 the Italian government has started a deep revision of the regulatory and legislative framework affecting national transport planning, aiming at establishing a more efficient, connected and sustainable mobility system, both for passenger and freight transport.

The main strategic planning documents have been the Annexes to the Economic and Finance Document, released since 2016, depicting the long-term strategy “Connecting Italy” and identifying the major objectives (intermodality and modal integration, sustainable urban development, useful, smart and shared infrastructures as well as enhancing the use of existing infrastructures) and a tool-box of operational measures – infrastructures, administrative simplification and incentives schemes – to achieve those goals.

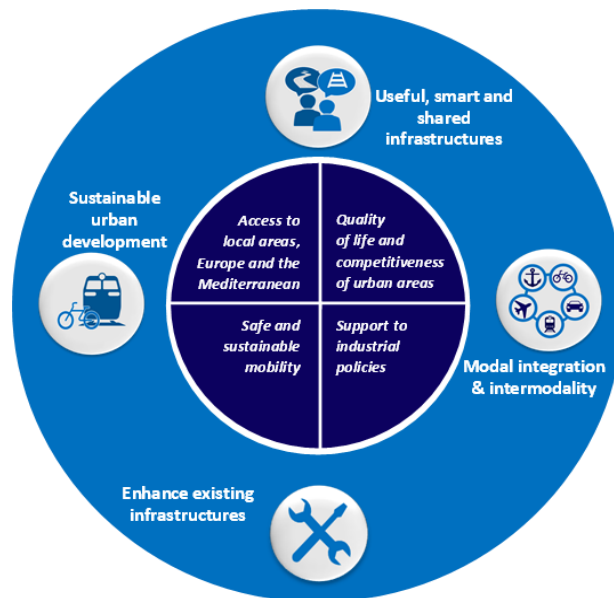
Connecting Italy is first of all but not limited to that, an infrastructural programme for the development of internal and international accessibility of the national territory and of the production and consumer markets, for passengers and for goods.

The “Allegati Infrastrutture” released from 2016 to 2018 have detailed the “Connecting Italy” programme by identifying objectives and strategies of the Italian transport policy, integrated with detailed targets and quantitative output indicators to be pursued at national level. In line with the “enabling” concept of the infrastructure, four strategic objectives have been identified as follows (and shown in the picture below):

- Accessibility to local areas, as well as to Europe and the Mediterranean Sea;
- Quality of life and competitiveness of urban areas;
- Support to industrial policies;
- Sustainable and safe mobility.

The Italian Government has also identified the implementing strategies aiming at reaching the above objectives, accompanied by a list of integrated actions.

Figure 4 – Strategies, objectives and action foreseen by “Connecting Italy”



In summary, the major infrastructural choices contained in it, defined and developed in coherence with the decision-making and regulatory framework described in the previous chapter, are the following:

- the high-speed rail network project, to complete the high-speed/high-capacity project ensuring a high level of connectivity and accessibility of the various areas of the country;
- completion of national road and rail routes in the logic of the National Integrated Transport System (SNIT), the Italian projection of the European core and comprehensive TEN-T networks;
- the development of the cross-border railway alpine passes, in order to connect Italy to the continental European markets and in synergy with the development of the national port system;

- the development of the national port system and its road and rail land connections, serving of national production and consumption markets in an international projection to enhance the role of Italy in the global competitive scenario;
- the development of the national airport system and its connections, in support of internal, international mobility and the promotion of tourism;
- the promotion of interventions in metropolitan areas to improve urban mobility in accordance with the principles of efficiency and sustainability;
- the focus on urban nodes decongestion, through infrastructural interventions aiming at separating long haul and transit traffic to the internal urban mobility (i.e. urban by-pass, etc..).

The planning and realization of strategic infrastructures of “Connecting Italy” refer to the National Integrated Transport System (SNIT) defined for the first time in the General Plan of Transport and Logistics (PGTL) of 2001 according to the logic of a “network” system.

2.3 Italian Transport Masterplan (PGTL)

The General Plan for Transport and Logistics (PGTL) contains the strategic guidelines for the mobility of passengers and freight as well as the infrastructural development of the country. The PGTL constitutes the reference framework of the set of interventions to be implemented on the Italian transport system, whose purpose is to improve the infrastructure of the country and make its use more efficient.

In order to define the addresses of the transport policy, the PGTL starts from an analysis of the National transport sector, in which the infrastructural needs are highlighted, together with the managerial and organizational ones, and the quality assessment of the offered transport services, on the basis of a current and forecasted demand and supply models at national and international level.

The last edition of the 2001 PGTL defined the strategic objectives of the System National Integrated Transport (SNIT) and established a degree of priority among the largest national infrastructural projects.

From the analysis of traffic volumes, several critical elements emerged such as:

1. The strong incidence of road transport both in passenger traffic (over 88%) and in freight traffic (almost 66%);
2. the non-homogeneous transport services in the different areas of the Country, and therefore the high levels of congestion in the Central-Northern Regions, and the low levels of accessibility in the Southern Regions.

In particular, the tool indicates the objectives that regional transport planning must pursue, distinguishing them between direct and indirect. The latter concern sectors outside the transport system, and establish the correlation between the forecasts of the system transport and those of territorial and urban planning tools.

In other words, the PGTL proposes the construction of a "planning process" within the regional transport plans, and therefore the rationalization of the regional transport systems, to be implemented through a series of actions that tend to overcome the traditional separation between typically sectorial planning, such as transport and territorial policies.

2.4 The Multiannual Planning Document (Documento Pluriennale di Pianificazione - DPP)

The Multiannual Planning Document (DPP), according to Legislative Decree 228/2011, is issued by the Italian Ministry of Infrastructure and Transport. It contains the list of transport and logistics interventions that have to be financed after a positive feasibility study, in accordance with the Italian Transport Masterplan (PGTL). The DPP contains indications about the procedural, physical and financial status of each project.

After the Legislative Decree 228/2011, the new regulatory and legislative framework introduced by the Legislative Decree 50/2016 (i.e. the new public procurement code), identified the DPP as one of the two main instruments for planning and programming transport infrastructures in Italy, together with the Transport Masterplan (PGTL). Specifically, the DPP assesses the current infrastructure needs (with the so-called Project Review), defines the program of interventions and selects the related sources of financing through a comprehensive technical and economic analysis of single project. In fact, the Decree 50/2016 allows also reviewing existing projects basing on the re-assessment of current needs, updated demand forecast, and current budget available.

The project review of existing infrastructure would help to improve the effectiveness and the efficiency of public spending by avoiding over-designed and un-needed projects and, the same time, it would guarantee the already undertaken legal and political commitments of the public administration. Two kind of project reviews are possible:

- first, a substantial reconsideration of financing the project which could lead to project exclusion from the DPP list;
- second, a project optimization (i.e. technical/technological revision) which would maintain the project in the DPP list but with possible revised cost.

Legislative Decree No. 228/2011 introduced and encouraged public administrations to work assessing at social and economic level their public investments. The Decree therefore introduced the obligation to draft the DPP which contains the three-year investment program for public works or public utility projects. In 2015, an addendum to the 2011 Decree was presented by the economic planning department which set up further methodological guidelines for the preparation of the DPP documents. The Ministry of Infrastructure for this reason in the DPP organizes a collection of ordinary infrastructure programming, it is also a summary of all the plans and investment programs of the ministry.

The DPP must be drawn up by 31/10 of each year and sent to CIPE, and the ministry must also present a report on the DPP's progress by 31/12 of the following year. It is composed of three sections:

1. The first section contains the analysis of infrastructure requirements. The part relating to infrastructures of national interest will be conducted as part of the PGTL updating activities and is partly already anticipated in the annex to the DEF 2017;
2. the second section illustrates the results of the ex-ante evaluations and selects the works to be carried out by identifying the priority intervention classes;
3. The third section defines the criteria for the ex-post evaluations of the identified interventions and summarizes the results of the ex-post assessments already carried out.

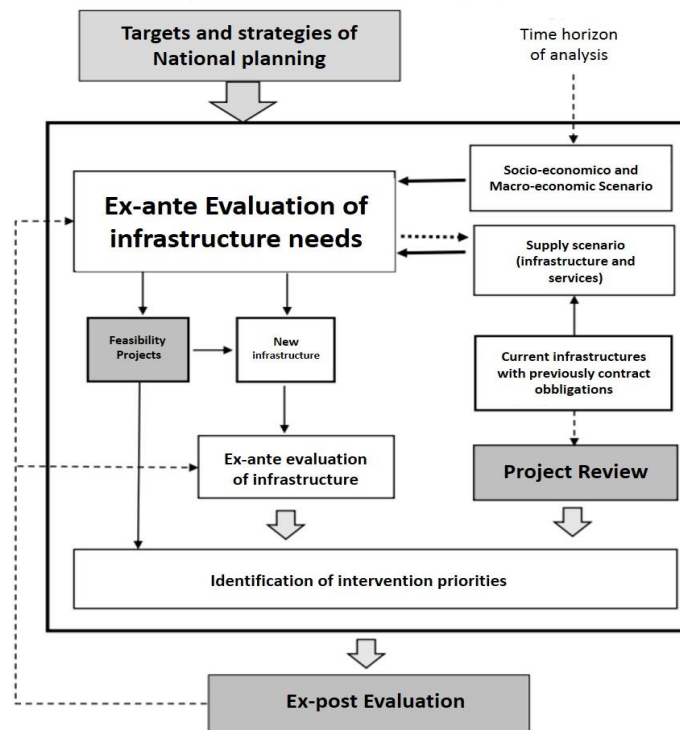
With references to local authorities, for the purposes of inclusion in the DPP the Regions, the Autonomous Provinces, the Metropolitan Cities and the other competent bodies transmit proposals to the Ministry of Infrastructures and Transport interventions of overriding national interest including the feasibility project drawn up in based on the provisions of the Code.

As already introduced at the beginning of the paragraph the new guidelines for the evaluation of the public works introduced have the objective of generating two evaluations, one before the realization of the work deemed to be of national interest, then an evaluation at the end of the work:

- Initial evaluation (Ex-ante) - It aims to define the demand thanks to a system analysis of the work through quantitative methods. It then identifies the methodology and tools with which the Ministry of Infrastructure and Transport carries out the scenario forecasts and the evolution of the transport demand-supply system aimed at the ex-ante analysis of needs.
- Evaluation completed (Ex-post) - It aims to measure the impact of the works carried out and to verify the possible deviation from the objectives and indicators envisaged in the planning and design phase.

In this framework the Guidelines for the evaluation of investments in public works are functional to both the ex-ante and ex-post evaluations and are aimed at stakeholders (institutional and not) of different nature:

1. to the General Directorate of Ministries responsible for planning;
2. to potential proposers (Regions, Metropolitan Cities, supervised companies, dealers, project financing promoters).



2.5 Sectorial plans

2.5.1 The National Strategic Plan for Ports and Logistics (Piano Strategico Nazionale della Portualità e della Logistica - PSNPL)

The National Strategic Plan for Ports and Logistics (PSNPL) released by the Ministry of Infrastructures and Transport and approved by the Council of Ministers in July 2015 sets the priorities and activities at a national level, to optimize the added value of the sea as a resource for the marine, port and logistics cluster, and for the entire economy of our Country.

The Plan is the instrument of strategic planning of the port sector, finalized to

- the improvement of the competitiveness of the port and logistic system;
- the increase of the traffic;
- the promotion of intermodality in freight traffic;
- the reform of the harbour governance.

It is meant to empower the transport sector and the general Euro-Mediterranean policies, in synergy with the priorities set by the European Union.

The implementing phase of the National Strategic Plan for ports and Logistics has conducted the Transport Ministry and the other involved public administrations to issue a series of norms and measures to implement the strategic objectives of the Plan.

National Strategic Masterplan for Ports and Logistics		
Masterplan's Vision: ✓ Enhance National Economy ✓ Active Political tool for the Mediterranean ✓ Development and cohesion of Sud – Italy ✓ Promoting sustainability	Objective 1 Process's Simplification	Action 1 Measures for simplification of procedures, checks and works on Ports interest
	Objective 2 Competition, Frankness, Service's upgrading	Action 2 Improve the efficiency of port services and increase the competitiveness of operators
	Objective 3 Improvement of accessibility	Action 3 Improvement of transport services and increase the accessibility to ports by land and sea
	Objective 4 Integration of the Logistics system	Action 4 Measures for the integration of the logistics chain and manufacturing activities
	Objective 5 Enhance infrastructure performances	Action 5 Measures for infrastructure upgrading of ports and their land connections
	Objective 6 Innovation	Action 6 measures to encourage research, development and innovation of ports
	Objective 7 Sustainability	Action 7 measures for energy efficiency and environmental sustainability of ports
	Objective 8 financial resources planning	Action 8 Measures for the management of financing and investment of port systems
	Objective 9 National Sea System Promotion	Action 9 Coordination, planning and promotion of the sea system
	Objective 10 New Governance model	Action 10 Measures to adjust the governance of ports to the vision

One of the most important “Actions” of the PSNPL is the Governance of Italian ports, and their regulatory reorganization, rationalization and simplification.

The following list shows some of the most interesting actions included in the PSNPL to promote intermodality and improve the logistics of freight:

- Action 1 (Simplification)
 - Simplification of procedures for approving infrastructure projects for Italian ports.
- Action 3 (Improvement of accessibility and connections)
 - The measures for the simplification of railway shunting in ports, in order to streamline and integrate processes in the Rail Containers Terminals and in port areas, enhancing and extending the use of existing ICT systems.
 - Introduction of the Fast Corridor in the terminals with adequate equipment and traffic volumes. This solution allows the handling of containers not subject to controls from the arrival port to a temporary storage area at the destination logistic node through a controlled railway corridor.
 - Extension of European rail freight corridors (RFCs), activated and in the process of being activated, up to and the international gateway ports.
- Action 5 (Enhance infrastructure performance)
 - Definition of projects on national road and rail networks and waterways to increase the national and international accessibility of Italian ports.
- Action 6 (Innovation)
 - Definition of projects on national road and rail networks and waterways to increase the national and international accessibility of Italian ports.

2.5.2 Framework Contract between RFI and MIT

Rete Ferroviaria Italiana (RFI) is a public company 100% owned by Ferrovie dello Stato Italiane Group (FSI) with act as Infrastructure Manager of the national railway network.

The Framework Contract is aimed at regulating the infrastructure investments related to safety and compliance with legal obligations, technologies for circulation and efficiency, "light" interventions, for the increase in existing line performances, and to "heavy" interventions, for the construction of new railway infrastructures and development of the network.

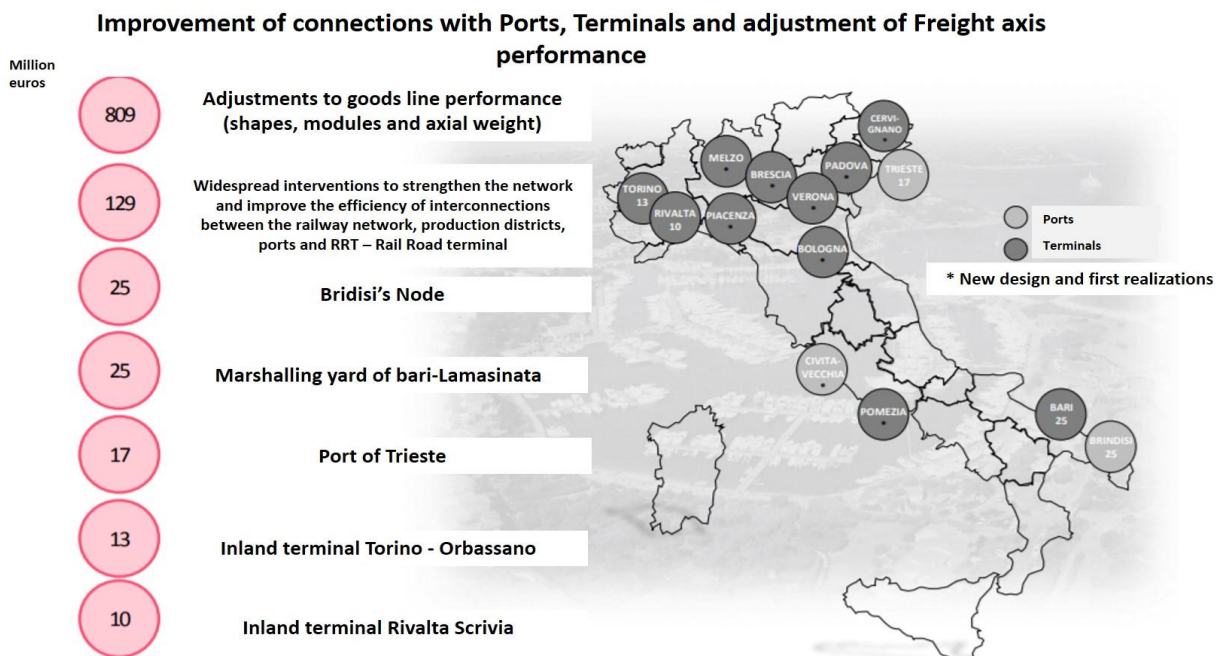
The new Framework Contract was approved by CIPE on August 2017 and by the Court of Audit in May 2019. This contract appoints 13,3 billion of euro for rail investments in the period 2017-2021. In detail the following intervention are planned and being implemented:

- Safety Programmes and compliance with legal obligations (for 2 billion);
- technologies for incrementing efficiency of lines, stations and equipment (688 million);
- development of regional/local networks (1.3 billion);
- upgrading and development of railways in metropolitan areas (885 million);
- multimodality development (ports, inland terminals and airports) (700 million);
- investment in upgrading and development of infrastructure in the main axis (EUR 5 billion);
- continuation of projects to be carried out for construction lots (EUR 2.6 billion).

In this Contract particular attention has been paid to measures on regional and local networks for commuter/local transport and to any kind of investment aimed at transferring freight from road to rail. These two pillars of the contract were developed in a general framework of greater safety, implementation of ICT innovation on trains, stations and lines, increase of quality of the services and intermodal connections for passengers and freight.

Italian Railways consider that a selection of strategic investments is essential in order to use the available economic/financial resources with more efficiency and effectiveness. This aim will be fostered also through the optimization of the existing infrastructures with investments in technology, coordinated actions between the different mode of transport and with managerial aspects. The investments are primarily finalized to

- develop the four European TEN-T corridors that cross Italy, with particular focus on improving national freight network and last mile connections to ports and RRT's (please find below a graphic description of some interventions planned);
- improve and upgrading infrastructure, especially in urban areas, in order to ensure high-quality standards services.



Source: RFI

2.5.3 Framework Contract between ANAS and MIT

ANAS (originally acronym of “National Autonomous Road Company”) is an Italian public limited company integrated since January 2018 into the Ferrovie dello Stato Italiane Group. The Anas is legally qualified as a body governed by public law. Moreover, within the European System of Accounts, Anas is one of the institutional units belonging to the sector of Public Administrations and, in particular, it is one of the companies in consolidated profit or loss of the Italian State budget.

With the Framework Contract ANAS 2016-2020 a new concept of road intervention has started. Greater emphasis has been put on the completion of axis, integration of routes and focus on safety and maintenance programmes. For the first time a fully financed multiannual investment plan has been established, permitting thus to have a long-vision certainty on investments and projects to be implemented.

The new Plan activates interventions on more than 60% of the network of over 26.000km. The multiannual scope determines a more efficient and productive investment planning than in the past. The interventions planned over the 5 years amount to 29.5 billion euro.

In some areas, upgrading or extraordinary maintenance have been planned, such as:

- On motorways: new highway A3 Salerno Reggio Calabria, E45/E55 Orte-Mestre, 106 jonica, the A19 Palermo-Catania, E78 Grosseto-Siena;
- On main roads: Road 372 Telesina, Road 16 Adriatica, Road 9 Via Emilia, Road 182 "Delle Serre calabre", Road 131 Carlo Felice and SS 554, Road 1 "Aurelia", Road 67 Tosco-Romagnola.
- Accessibility to main nodes: the connections with the airport of Malpensa,
- Main urban area: Ring Road of Rome.

2.6 National incentives and measures for the promotion of intermodal transport

In addition to the infrastructural side, Italy pursues its transport policy also through the implementation of incentives to the transport industry aiming at shifting road traffic to sustainable modes (notably maritime and rail transport modes), thus delivering cost-saving mobility with reduced environmental and social impact. The main incentives currently into force are the so called Marebonus, Ferrobonus and Sconto Traccia as described below.

Marebonus and Ferrobonus are two of contributions and incentives for intermodality established with Law 28 December 2015 n. 208 from the Italian Government and that have begun from 2017, through Regulation n. 125 of the 14 July 2017 that has stated the beneficiaries, the measure of aid, the modalities and procedures for the implementation of the incentives.

Both contributions will further contribute to the EU’s environmental and transport objectives, while respecting competition in the single market. In fact, support for a less polluting mode of transport than road transport will have a positive impact on the environment, will lead to a reduction in road congestion and mobility benefits.

2.6.1 Marebonus

The Marebonus, has a budget of EUR 118 million and is intended to encourage freight transport by sea rather than by road, and to reduce pollution and congestion on the roads. In line with the relevant provisions, public support is limited to financing some of the additional costs of switching to more environmentally friendly modes of transport.

The Marebonus aims to support maritime shipping companies that forecast a three-year investment plan for the realization of new maritime services or the upgrading of existing Ro-Ro and Ro-Pax lines. The bonus it is useful even for maritime shipping companies of the European Economic Area, for the multimodal transport of freight or the improvement of the same services on existing routes, arriving and departing from ports located in Italy, connecting ports located in Italy or in the Member States of the European Union or the European Economic Area, in order to support the improvement of the intermodal chain and the decongestion of the road network.

The incentive is calculated on the Intermodal Transport Units (ITU) multiplied by the kilometric routes subtracted from the road journey on the Italian road network. The instrument is completed with the upset of a quota of the received contribution in favour of the road haulage enterprises that have used the maritime services.

The contribution is therefore paid to both shipowners and hauliers.

2.6.2 Ferrobonus

The Ferrobonus is the incentive set up by the Law of Stability for the three years 2016-2018 to support of the arranged transport and transhipped on rail. The objective is the displacement of the traffic of the freight from the road to the rail through an incentive of the use of the intermodal transport and the transport transhipped from and towards logistic nodes and interposing to you Italian, by means of an incentive for railway undertakings and multimodal railway operators.

The incentive is addressed to the users of intermodal rail transport services and/or to multimodal combined Transport Operators (MTO) which buy complete trains from railway undertakings and which undertake to maintain traffic volumes in terms of trains*kilometre and to increase them during the incentive period. The MTOs benefiting from the contribution shall be required to overturn a share of the incentive received to rail users.

The Ferrobonus measure, which has a budget of EUR 58 million for a two year period, is therefore intended to facilitate the transfer of freight traffic from road to rail, by granting subsidies to railway operators and, specifically, in southern Italy where the imbalance between the use of the railways and that of the road is much more marked. In accordance with the guidelines, the level of support that beneficiaries may receive under the scheme is based on a reduction in the infrastructure and external costs incurred by rail transport operators compared to road transport.

2.6.3 Norma Merci (Sconto Traccia)

So called "Sconto Traccia" (Art.47. c. 11quinques DL 50 del 24/4/17, updated with L 96 del 21/6/17) is an incentive schemes targeted to intermodal operators that respect rail loads threshold for 5 years.

The authorized measure for the 2015-2019 period has an annual budget of around 100 million per year. The beneficiaries are the railway companies and the amount of the contribution is proportional to the trains / km covered on the national network by each company and is divided into two rates:

- one part is aimed at offsetting the extra costs of access to the railway infrastructure estimated in the national peripheral regions (South Italy and Island);
- one part is calculated on the environmental benefits attributable to the use of the railway mode rather than road.

The "Sconto Traccia" rule is one of the measures supporting intermodal freight transport. This measure supports rail traffic by compensating for the charges for the transport of goods and the fee for using the infrastructure due by the railway companies.

The "toll discount" is worth 1.5 euros / km, which become 2.8 if the origin or destination of the intermodal trains are in southern Italy. On the complete intermodal service (including shunting costs, etc ...) the discount will be about 7-8% on long journeys, 4-5% on short journeys.

3. Transport infrastructure in Italy

3.1 National strategic transport infrastructures

Main references of this paragraph are strictly connected with Chapter 2 and the list of strategic transport infrastructure is taken from those documents. Main sources of information consist in:

- Italian Transport and Logistics Masterplan (Piano Generale dei Trasporti e della Logistica – PGTL) with the Italian System of Transport Infrastructure (Sistema Nazionale delle Infrastrutture di Trasporto - SNIT);
- The Infrastructure Annex of the Economic and Financial Document, the document named “Connecting Italy”;
- the Multiannual Planning Document.

3.1.1 Italian System of Transport Infrastructure (Sistema Nazionale Infrastrutture di Trasporto - SNIT)

The Integrated National Transport System (SNIT) is an integrated system of infrastructures that constitute the milestone of passengers and freights mobility to be completed within year 2030. The SNIT it is a vision from the General plan of Italy Transport of the year 2001, updated in 2017 taking into consideration also the new transport network designed at EU level (TEN-T network).

The SNIT, defined in its current version to the 2017 Economy and Finance Document, includes existing and prospective transport infrastructure dedicated to the provision of services of overriding national and international interest.

The SNIT system has two layers of links and nodes (i.e. “1st level ” and “2nd level ” SNIT) identified with a logic recalling that of the TEN-T Core and Comprehensive, as described in the table and figures below per transport mode¹:

Mode of Transport	1 Level SNIT	2 Level SNIT
Railway	SNIT 2001 network (only long-haul passengers and freight axis) + TEN-T core and comprehensive network + additional last mile connections to ports and airports	Residual railway lines

¹ The SNIT includes also the urban nodes that for the purpose of the present document have not been listed as they mainly concern passenger transport

Figure 1 - The 1° level national railway network for goods



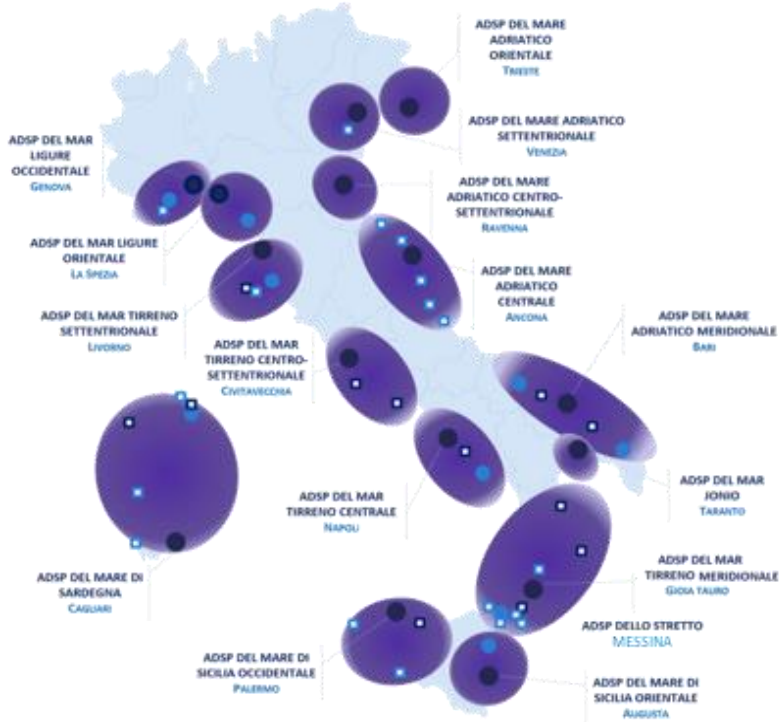
Mode of Transport	1 Level SNIT	2 Level SNIT
Highways and Motorways	SNIT 2001 network + TEN-T core and comprehensive network + last mile connection to airports, ports, touristic hubs and industrial districts	Residual roads under State property and management

Figure 6 - The 1° level national railway network for goods



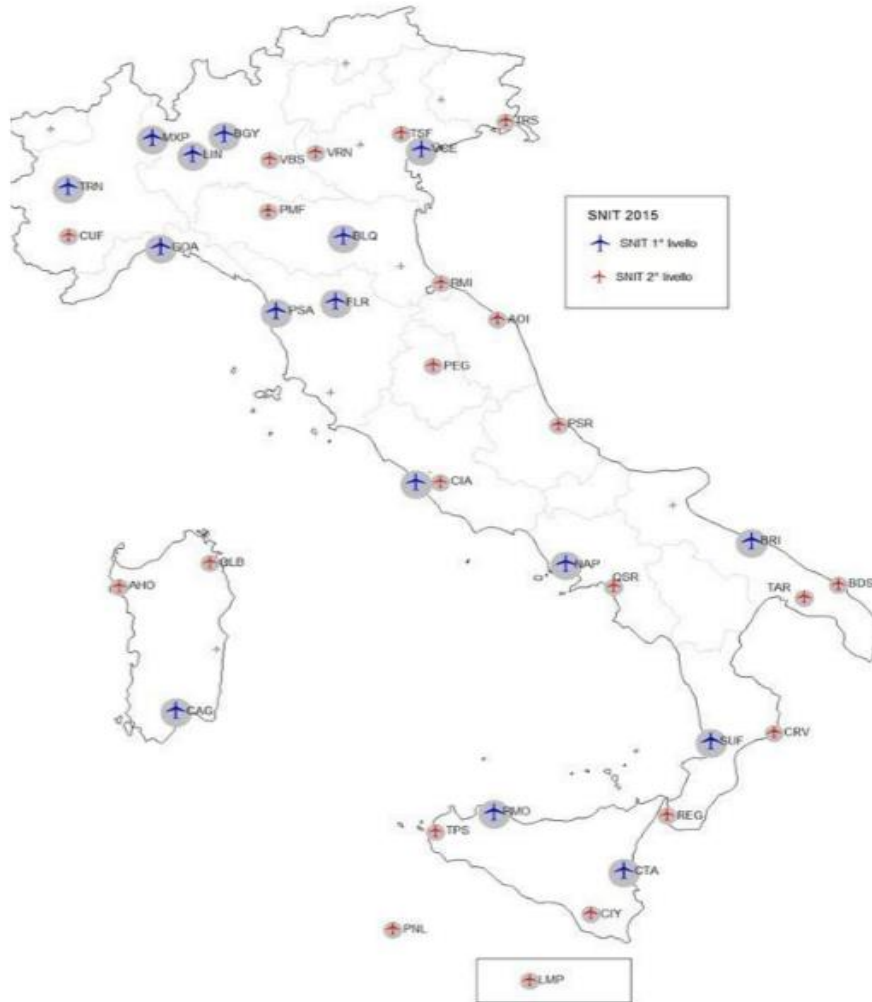
Mode of Transport	1 Level SNIT	2 Level SNIT
Ports	16 Port Network System Authorities, embedding 58 ports of national relevance	

Figure 7 - The 1° level national port network



Mode of Transport	1 Level SNIT	2 Level SNIT
Airports	16 strategic airports, core airports in the TEN-T frame	22 residual infrastructures as stated in the National Airport Plan

Figure 8 - The 1° and 2° level national airport network



3.2 Gap Analysis between the European and National transport planning network

In the table below the gap analysis (misalignment) between the European networks TEN-T and the Integrated National Transport System (SNIT) is shown for railways and maritime ports:

Table 1 - Main misalignment between TEN-T and national transport architecture

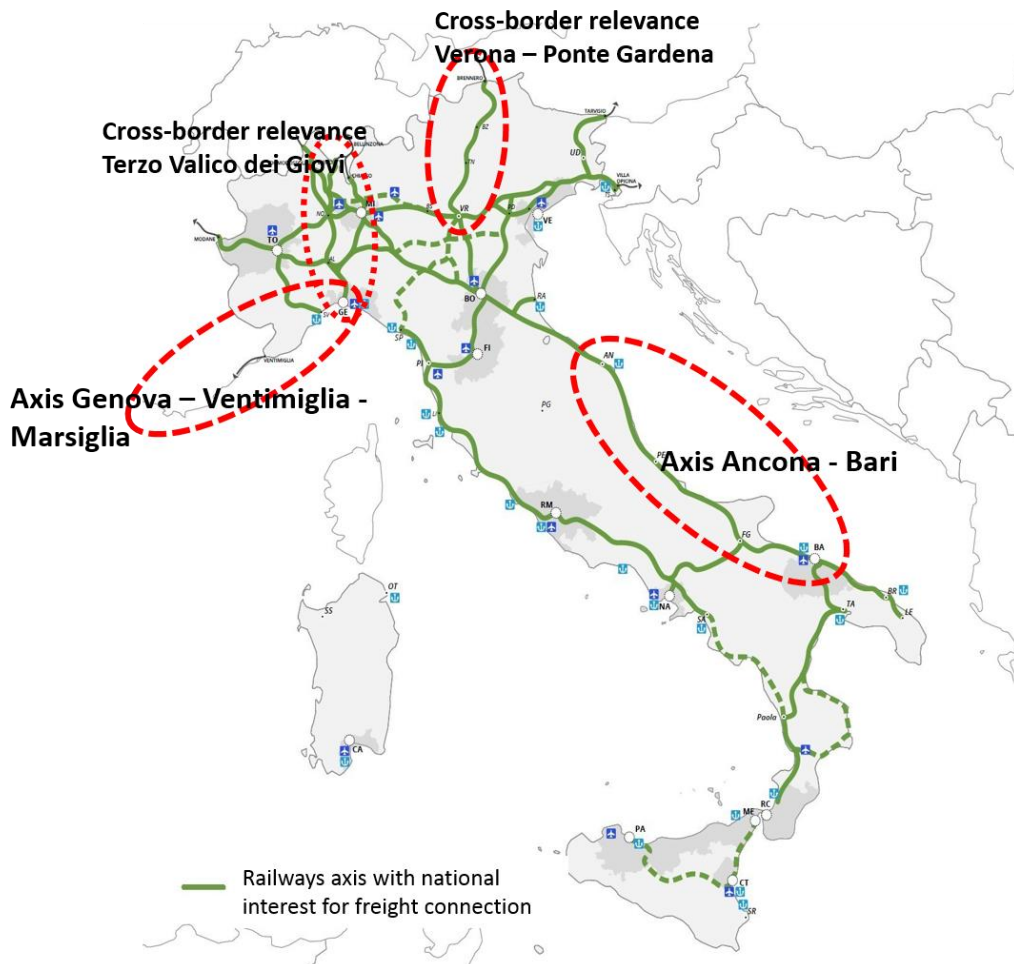
TRANSPORT MODES / NODES	MISALIGNMENT TEN-T / SNIT	PROPOSAL
Railway	The Adriatic Axis Ravenna-Ancona-Bari	Extension of the IT core network along the Adriatic coastal route and extension of the BAC CNC on the section Ravenna-Bari
	The rail section Genova-Ventimiglia (to Marseille) as diversionary line of the MED corridor	Re-alignment of the MED CNC along the diversionary section Marseille-Ventimiglia-Genova-Alessandria-Turin
	Cross border relevance of the access corridor (Verona-Ponte Gardena) to the Brenner Base Tunnel	Inclusion of the Verona-Ponte Gardena as cross-border section of the SCAN MED CNC
	Cross border relevance of the access corridor (Terzo Valico dei Giovi) to the IT-CH border	Inclusion of the Terzo Valico dei Giovi as cross border section of the RALP CNC
Maritime/Ports	Autorità di Sistema Portuale Center-Northern Tyrrhenian Sea	Inclusion of ADSP Center-Northern Tyrrhenian Sea as core port along the SCAN MED CNC
		The "Port Cluster" has to be considered as a unique core node.
	The new 15 Autorità di Sistema Portuale (ADSP), as foreseen in the Legislative Decree 169/2016, have included and clustered the former 24 Italian Port Authorities. The governance, operational, administrative, financial and budgetary aspects are consolidated in a unique legal entity, the ADSP, where the headquarter is a core port following the TEN-T classification (with the exception of Autorità di Sistema Portuale Center-Northern Tyrrhenian Sea).	Following the provisions of the European Commission COM(2013) 940 - "The planning methodology for the trans-European transport network (TEN-T)": "Seaports which are immediate neighbors and together fulfill the volume threshold, even if individually they would not, may be considered as a cluster, if they have common hinterland connections, except for the "last mile", or if they cooperate closely, e.g. under common management, or supplement each other in function".

Despite in the SNIT most of the investment programs concurs at completing the TEN-T Core and Comprehensive networks as well as on the horizontal priorities in Italy, the SNIT does include some additional transport links and nodes strategic for Italy, not yet incorporated in the Core Network and/or in the alignment of the Core Network Corridors (CNC).

The 1st level SNIT of Railway network does include the following links that are missing in the TEN-T Core network:

- The Adriatic axis, between Ancona and Bari;
- The access corridor to the Brenner Base Tunnel, between Verona and Ponte Gardena;
- The rail section between Genova and Ventimiglia, as diversionary line of the MED corridor:

Figure 9 - Representation of the main freight railway axes misalignment between TEN-T and SNIT architecture



3.3 Main characteristics of transport infrastructure in Italy

3.3.1 Railways – RFI Network

This Section describes the principal characteristics of the Italian rail and the detailed information, such as the characteristics of the lines and facilities, are based on the interactive request via the Internet called PIR WEB, which is an integration of the NS.

The PIR WEB is based on georeferenced maps (GIS) and interactive thematic graphics characterised by detailed descriptive windows. The request makes it possible:

1. To select options and adopt the available instruments;
2. To select maps with different bases (satellite, land surveys, urban surveys and other);
3. To choose the theme to be represented (e.g. operating system, type of code for combined traffic – PC, train operation control system and other);
4. To select data aggregated geographically (commercial line, traffic catchment area) or manually (geometric points, lines and areas) and display/export the detailed data in tables;
5. To display the representation of the summary layouts and other technical information.
6. The PIR WEB can be consulted online with access credentials on the RFI portal: www.rfi.it > Servizi e Mercato > Per accedere alla rete > Prospetto informativo della rete or at the <http://pir.rfi.it/pir> website

The PIR WEB will be updated as follows:

- in December of year X, the IM will provide the infrastructure scenarios relating to December of year X and year X+1;
- in June of year X+1, the IM will provide the infrastructure scenario at that date and an update of the infrastructure scenario for the December X+1.

Extent of network

The national rail infrastructure is the one referred to in the DM 138T of 31 October 2000.

For the sole purpose of the requirements related to the management rules, the infrastructure is articulated into nodes, basic network and secondary network (which, in turn, is broken down into secondary-network lines, limited-traffic lines, shuttle lines).

The extension of each of the Network components according to the above-mentioned DM is shown in the home page of the PIR WEB (see the picture below).



Network description

The rail network structure shown in the PIR WEB is broken down into basic elements consisting of arcs developing between the two ends represented by Network facilities or stations and service locations (junctions, communication facilities). It is possible, thanks to the selected representation, to investigate in detail the characteristics of the basic section and/or end facility.

In the PIR WEB, the railway lines and facilities are reported in accurate geo referenced detail. The following elements are shown as reference points on the maps:

- Regional capital cities
- Main locations

- Other locations
- Engineering locations

It is possible to mention in detail and place the rail lines and facilities within the context of the other infrastructure (for example, the thematic open street map makes it possible to superimpose the road and rail infrastructure).

Line characteristics

The gauge of the national rail infrastructure lines is 1435 mm.

Line coding is shown in the PIR WEB. As can be seen in the screenshot of the PIR WEB above, only the 21.23% of the Italian railway network has the standard PC80 (that is the equivalent of the European standard P400).



This standard is necessary to load the trailers on the train. RFI is steady working to improve the railway network, especially to bring this format to the Italian ports. In this way, it will possible to move the trailers coming from foreign countries from ports to the freight villages (and vice versa) avoiding road transport. In fact, these improvements are focused in the European objective of reduction of the emissions, pollutants and of the overall environmental impact.

Axle load limits

Regarding the axle load category, the characteristics of the network highlights the presence of special limitations relating to axle-loads above the accepted limit. These limitations can be found in the document called “Caratteristiche tecnico-funzionali della Infrastruttura ferroviaria nazionale gestita da RFI” (Engineering and functional characteristics of the railway infrastructure managed by RFI) and will be communicated during the planning phase on request of the RUs concerned.

The values corresponding to classifications shown in the map are as follows:



Category	Mass per axle	Mass per current metre
D4	22.5 t	8.0 t/m
C3	20.0 t	7.2 t/m
B2	18.0 t	6.4 t/m
A	16.0 t	5.0 t/m

Line slope

The maximum line gradient (expressed in “thousandths”), for both directions, can be found in the PIR WEB (as can be seen in the screenshot below).



Maximum train length

The network train length capacity – representing the maximum length that can be used by freight trains on the line (locomotive(s) plus hauled stock) – is shown both in the PIR WEB and in the Market Plan of RFI.



Power supply system

The power supply systems available are:

- ET (Electrical Traction) by direct current at 3000 V on conventional lines;
- ET (Electrical Traction) by alternate current at 25,000 V on HS/HC lines;
- DT (Diesel Traction) on non-electrified lines.



Traffic Control and Communication Systems

The control system adopted on the infrastructure is indicated in the PIR WEB. BAB means Blocco Automatico Banalizzato, automatic block of two-way working lines, BA means Blocco Automatico, automatic block, BCA means Blocco Conta Assi, axle-counter block, BEM means Blocco Elettrico Manuale, hand-operated electric block, ERTMS means European Rail Traffic Management System.

The ground-to-train communication system, called GSM-Railway, was introduced on 25 October 2004. Since then the national Infrastructure Manager is directly responsible for the mobile communications services for railway operations, among which are emergency calls, group calls and the handling of priority calls.

In the line operating system of the infrastructure (that can be seen in the PIR WEB portal) are used some acronyms. The symbols used are: DC means Dirigente Centrale (Central Traffic Controller), CTC means Controllo Centralizzato del Traffico (Centralized Traffic Control), where the Dirigente Centrale Operativo

operates, DL means Dirigenza locale (Local Traffic Controller), DU means Dirigente Unico (Single Track Line Traffic Controller); where “Others” is written, reference should be made to the service publications relating to the line.

The installation of the Sistema di Controllo Marcia Treno (SCMT), the Train Operation Control System, in the infrastructure is indicated in the PIR WEB.

As regards the characteristics and functionalities of the two systems, reference should be made to the regulations posted in www.rfi.it

3.3.2 Ports

The Italian port system has been recently interested by a sharp regulatory revision operated by Legislative Decrees 169/2016 and 232/2017.

Synthetically, the Reform of Port Sector and Logistics reorganized and simplified the National Port System, through a consolidation of responsibilities over port management by creating 15 new Port System Authorities (16 indeed since the approval of the Decreto Legge 23 ottobre 2018, n. 119), replacing the more numerous old port authorities.

The new Port Authorities have a simpler governance structure than the old port authorities, which is expected to speed up decisions making.

Also, the reform has simplified procedures for passenger and cargo transit and strengthened the central coordination of the Ministry of Infrastructure and Transport and Infrastructure with the establishment of the National Coordination Conference acting as a coordinating committee of Port system Authorities with strategic planning functions related to relevant port infrastructure investments, avoiding thus incoherent or competitive investments among port’s clusters.

The Port System Authorities are non-economic public entities based on the 16 Italian core/comprehensive ports (Genova, La Spezia, Livorno, Civitavecchia, Cagliari, Napoli, Palermo, Augusta, Gioia Tauro, Messina, Taranto, Bari, Ancona, Ravenna, Venezia and Trieste) and will have a strategic role in policy, programming and coordinating the 58 main Italian the ports falling in their geographic area. Their responsibilities cover ordinary and extraordinary maintenance of the common parts of ports, the provision of port servicers, the power to grant concessions and improvement of port connections with the broad transport network.

Focusing on the offer side, historically the Italian port system has been featured by the existence of a number of ports of medium-small size serving interregional or intraregional gravitational productive areas, with multipurpose vocations. Just few of them are single-segment specialized, such as Augusta and Trieste in liquid bulk, Taranto in dry bulk and Gioia Tauro as container transshipment hub.

Regarding the infrastructural features of the Italian ports, and having premised the multipurpose functions of most of them, we hereby provide a table quantifying and summarizing the availability of storage areas, the equipment facilities, the number and surface of berths as well as the availability of rail tracks on berths.

Table 2 - Features of Italian Ports at 31.12.2018

PORTS	Storage areas (yards)		Number of handling equipment		Berths			Number of Berths equipped with railway tracks	
	Number	Square meters available	Container	Non container cargo	Number	Length (mt)	Surface pier (sqm)	linked to railway network	not linked to railway network
Savona	2	860.457	4	32	74	15.859	62.340	17	51
Genova	n.d.	3.055.381	378	133	98	25.105	1.750.558	20	34
La Spezia	13	627.572	94	12	48	6.882	590.690	8	23
Marina di Carrara	n.d.	166.841	25	7	8	1.607	126.840	2	6
Livorno	30	1.642.679	112	367	214	33.415	383.058	9	11
Portoferraio	n.d.	84.000	-	-	25	2.671	23.756	-	-
Civitavecchia	16	766.305	44	44	38	9.087	672.779	3	-
Roma-Fiumicino	2	8.159	n.d.	2	16	12.296	30.750	-	11
Gaeta	4	143.250	-	55	38	12.631	80.133	-	-
Napoli	8	372.300	50	23	53	15.766	421.224	4	32
Castellammare di Stabia	3	11.740	-	3	26	4.990	54.581	1	11
Salerno	15	250.060	53	64	81	12.926	467.306	-	21
Vibo Valentia Marina	11	31.128	-	2	17	3.989	66.380	-	9
Gioia Tauro	n.d.	2.200.000	210	40	19	5.555	155.031	-	-
Reggio Calabria	2	2.960	-	3	27	7.690	123.523	-	4
Crotone	-	-	3	14	20	3.998	2.713	-	-
Corigliano Calabro	2	13.000	-	10	11	3.323	310.000	-	-
Taranto	4	127.235	84	29	22	10.366	178.113	1	21
Brindisi	5	565.613	21	105	40	12.396	778.961	1	26
Bari	2	104.259	3	64	22	4.947	86.580	-	18
Molfetta	2	7.000	-	3	18	1.851	11.415	-	9
Barletta	1	28.044	-	12	19	5.205	51.897	-	1
Manfredonia	10	48.681	-	5	32	7.902	72.506	7	-
Ortona	7	65.000	1	56	14	3.162	110.525	2	6
Pescara	1	8.968	-	1	14	3.424	52.603	-	9
Ancona	12	175.190	46	23	49	7.517	225.704	8	1

PORTS	Storage areas (yards)		Number of handling equipment		Berths			Number of Berths equipped with railway tracks	
	Number	Square meters available	Container	Non container cargo	Number	Lenght (mt)	Surface pier (sqm)	linked to railway network	not linked to railway network
Pesaro	1	3.140	-	-	20	4.191	46.385	-	-
Ravenna	5	1.559.206	70	93	50	24.131	422.045	9	31
Chioggia	n.d.	11.433	3	11	32	1.650	n.d.	13	19
Venezia	n.d.	2.100.000	86	54	134	15.340	12.925	57	8
Monfalcone	10	850.000	-	150	29	7.867	74.811	8	20
Trieste	n.d.	925.000	150	116	70	13.977	n.d.	30	34
Cagliari	10	628.771	94	55	57	16.957	861.907	-	24
Olbia	-	-	-	50	75	14.205	167.613	1	18
La Maddalena	2	7.125	-	-	16	1.149	17.176	-	15
Porto Torres	11	120.190	-	31	47	15.715	258.878	-	-
Oristano	1	154.000	3	24	12	2.590	112.117	-	12
Messina	5	71.163	-	1	23	3.119	74.558	7	9
Catania	n.d.	280	4	42	30	5.785	331.317	-	4
Augusta	2	300.000	4	3	12	7.735	34.746	-	-
Siracusa	-	-	-	-	24	2.679	n.d.	-	21
Pozzallo	2	2.500	3	20	8	6.209	180.890	-	6
Gela	-	-	-	-	5	1.129	7.200	-	-
Porto Empedocle	16	32.565	-	18	22	5.192	75.889	-	19
Trapani	8	27.500	27	21	39	7.082	121.562	-	7
Palermo	10	136.000	54	42	43	8.179	210.428	-	13
Milazzo	2	31.400	-	8	32	10.570	83.210	-	12
TOTAL Italy	237	18.326.095	1.626	1.848	1.823	410.011	9.983.623	208	576

Source: RAM elaboration on CNIT data; considered only major IT ports

3.3.3 Roads and focus on Motorways

The whole Italian road network (with the exception to the municipalities' roads), in early 2018, amount at 171.481 Km articulated as follows:

- 6.943 Km of Motorways, including the network managed by ANAS;
- 22.399 Km of Highways;
- 142.139 Km of Regional and Province's roads.

In the table below it is shown the evolution since 1990 of the three different categories of road infrastructures at national level. The high increase in the extension of the local roads registered since 2001 is a direct result of the transfer of property and assets from the central government to the Regions and local public authorities.

Table 3 – Evolution 1990-2017 of the Italian road network

Extension in Km	1990	2000	2010	2013	2014	2015	2016	2017
Motorways	6.185	6.478	6.668	6.751	6.844	6.943	6.943	6.943
Highway	44.742	46.556	20.856	19.920	19.894	21.686	20.786	22.399
Regional and Province's Roads	98.396	102.076	146.280	142.333	143.047	143.053	142.632	142.139
Total	149.323	155.110	173.804	169.004	169.785	171.682	170.361	171.481

Source: CNIT 2019

The Italian Motorway network is managed by concessionary companies, under public and private law, which respond to different granting parties.

The majority of the concession network is regulated by the Ministry of Infrastructure and Transport, succeeded to Anas S.p.A. in the role of grantor since 01 October 2012, through its General Directorate for Supervision of Motorway Concessionaires (DGVCA), established by Decree of the President of the Council of Ministers 11 February 2014, n. 72.

Anas S.p.A., a company subject to the supervision of the Ministry of Infrastructure, currently exercises the role of concessionaire for the "free toll" motorway network, and the role of grantor, indirectly, through participation in other companies (CAL S.p.A.).

In application of the rules of territorial federalism, regional companies have been set up in order to cover the function of concession grantor in newly constructed road sections that have been assigned.

The Motorway network, subject to user toll payment, granted by the Italian Ministry is managed by 22 companies regulated by 25 concessions and the whole network has a length of 5.886,6 Km, as described in the table below.

Table 4 – List of companies managing the Italian Motorway network under concession

id	Company	Extension Km
1	ATIVA SpA	155,8
2	Autostrade per l'Italia SpA	2.857,5
3	Autostrada del Brennero	314,0
4	Autostrada Brescia – Verona – Vicenza – Padova SpA	235,6
5	Autostrade Centro Padane SpA	105,5
6	SALT SpA – tronco Autocisa	101,0
7	Autostrada dei Fiori SpA – tronco A10	113,3
8	CAS – Consorzio per le Autostrade Siciliane	298,4
9	Autovie Venete SpA	210,2
10	Milano Serravalle – Milano Tangenziali SpA	179,1
11	Tangenziale di Napoli SpA	20,2
12	RAV – Raccordo Autostradale Valle d'Aosta SpA	32,4
13	SALT SpA – tronco Ligure Toscano	154,9
14	SAT – Società Autostrada Tirrenica SpA	54,6
15	SAM – Società Autostrade Meridionali SpA	51,6
16	SATAP A4 Torino – Milano	127,0
17	SATAP A21 Torino – Piacenza	164,9
18	SAV – Società Autostrade Valdostane SpA	67,4
19	SITAF – Società Traforo Autostradale del Frejus SpA	82,5
20	Autostrada dei Fiori SpA – tronco A6	130,9
21	SITMB – Società Italiana Traforo del Monte Bianco SpA	5,8
22	SITRASB – Società Italiana Traforo Gran San Bernardo SpA	12,8
23	Strada dei Parchi SpA	281,4
24	Società Autostrada Asti – Cuneo SpA	55,7
25	CAV – Concessioni Autostradali Venete SpA	74,1
TOTAL		5.886,6

The network above mentioned is featured as follows:

Table 5 - Features of the Italian Motorway network under concession

Motorway toll Network	5.886,6 Km of which:
2 lanes	4.039,2 km
3 lanes	1.722,9 km
4 lanes	122,7 km
5 lanes	1,8 km
Tunnels > 100 mt length	871,3 km
Bridges and viaducts > 100 mt length	1.031,4 km
International/Cross-border tunnels	Nr. 3

The network managed by ANAS, instead, has an extension of 953,8 Km free of toll, in the section represented in the next table:

Table 6 – List of Italian Motorways sections under ANAS management

Id	Section	Extension Km
1	A90 Grande Raccordo Anulare di Roma (GRA)	68,2
2	A91 Roma – Fiumicino	17,4
3	A3 Salerno – Reggio Calabria	442,9
4	A29 Palermo – Mazzara del Vallo e diramazione Punta Raisi	118,8
5	A29 Dir – Alcamo – Trapani e diramazione per Birgi	50,0
6	A19 Palermo - Catania	192,8
7	A19 Diramazione per Via Giafar	5,2
8	A29 Racc. Bis – Raccordo per Via Belgio	5,6
9	A18 Dir – Catania Nord – Catania Centro	3,7
10	Catania - Siracusa	49,2
TOTAL		953,8

3.3.4 Rail Road Terminals

The following table shows the data about the most relevant features of the Italian freight villages, like the total surface, the built area and the warehouse surface. It is easy to understand that Verona, Marcianise and Bologna are the main Italian freight villages according to the total surface figures. However, taking in consideration only the built area inside the total surface, the bigger inland terminals are Verona, Torino, Bologna, Parma, Padova and Nola. Finally, using the third parameter that is the warehouse surface, the main rail-road terminals are Torino, Bologna and Parma.

Table 7 - Main features of Italian RRT

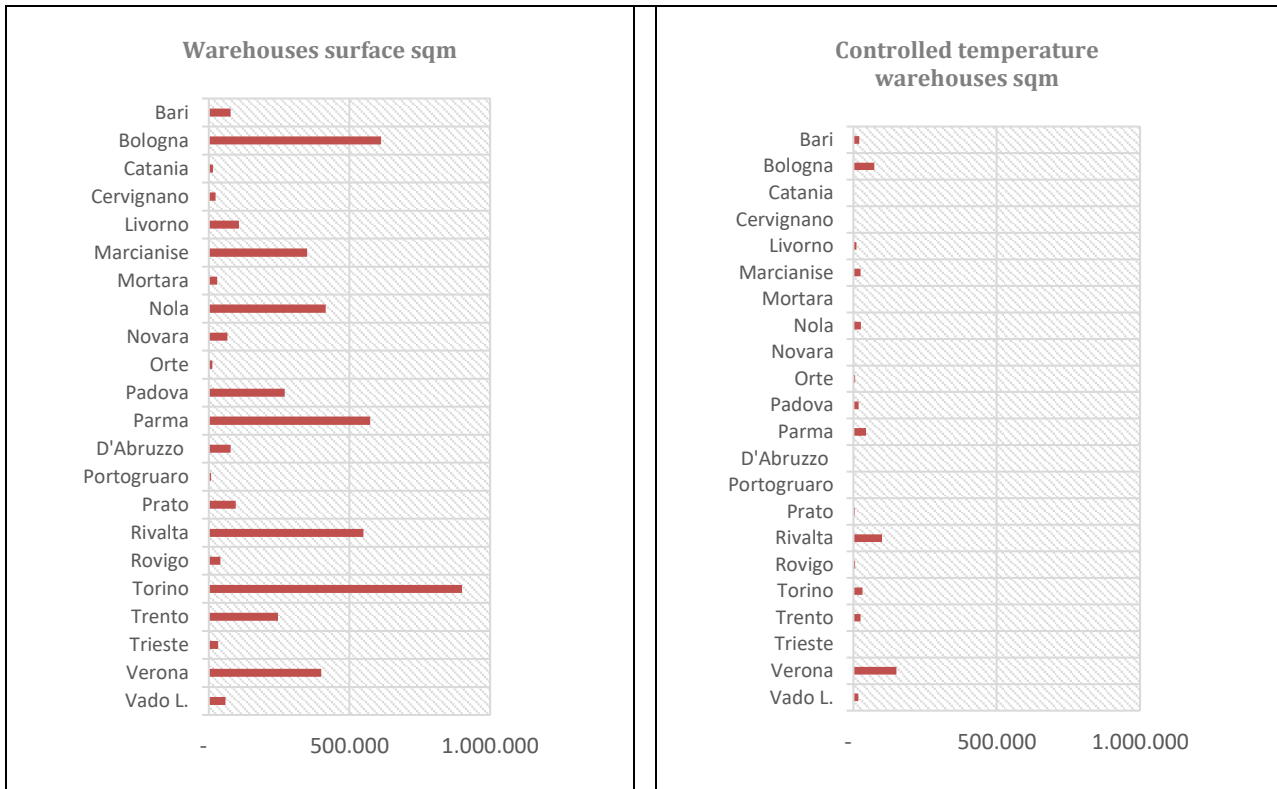
Freight village	Total surface	Built area	Warehouses
Verona	4.200.000	2.823.600	400.000
Bologna	4.194.098	3.713.093	612.344
Marcianise	4.100.000	1.300.000	350.000
Torino	3.000.000	2.840.000	900.000
Nola	2.900.000	2.000.000	416.000
Livorno	2.800.000	1.442.989	106.800
Parma	2.521.815	2.040.749	574.000
Padova	2.000.000	2.000.000	270.000
Rivalta	1.250.000	1.250.000	550.000
Trento	1.000.000	700.000	246.000
Pescara	960.000	960.000	78.000
Novara	845.000	785.000	66.500
Prato	712.000	521.000	96.200
Mortara	704.754	250.000	30.000
Cervignano	460.000	430.000	24.000
Bari	400.000	400.000	77.400
Rovigo	350.000	250.000	41.000
Orte	320.000	180.000	12.500
Portogruaro	1.500.000	500.000	8.000
Vado L.	232.000	115.000	59.000
Trieste	229.000	163.000	33.000

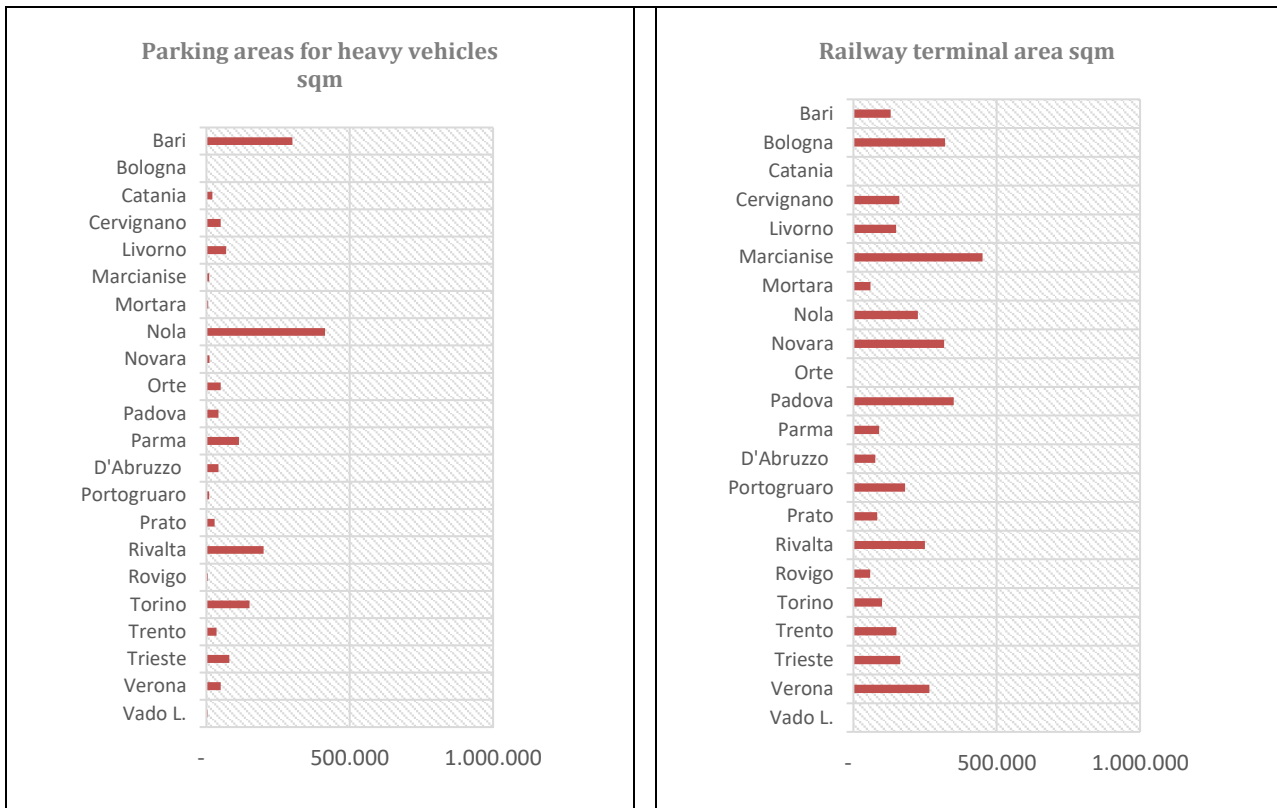
Source: UIR

Deeply in the analysis, the infrastructure supply linked to the freight villages is composed by different elements. The main ones are the availability of warehouses for dry and frozen goods, of parking area for heavy vehicles and of areas for railway terminals.

The following diagrams highlight (using the same scale of values) the relationship between the different areas of the freight villages, showing that these nodes are mainly composed by warehouses and a little part of them are used for the cool and frozen goods. The results of this analysis are a different distribution of the areas dedicated to the road and to the rail transport. The freight villages more focused on the road transport are Nola, Rivalta and Bari where there is the 56% of the parking areas for the heavy vehicles. On the other hand, the freight villages with a bigger supply of railway infrastructure are Marcianise, Padova, Bologna, Novara. These nodes represent together the 40% of the Italian freight villages railway supply.

Figure 10 - RRT sqm dedicated to categories of warehouses, railway terminal and parking areas





Source: CERTeT on UIR data

Finally, the following table shows the terminal equipment, focusing especially on the operative tracks, marshalling yard and maximum length of the trains. As can be seen, only the freight villages of Bologna and Nola have already the infrastructure to manage the trains 750 meters-long, as requested from the 1315/2013 regulations that have established the TEN-T network. In addition, it is important to point out that the maximum length constraints depend on the line where the freight village are placed since in some marshalling yards is possible to split the train in two or more parts in order to handle it in the loading and unloading tracks.

Table 8 - Railway Infrastructures in Italian RRT

Freight village	Number of working tracks (loading/unloading)	Number of the railway tracks on the marshalling yard	Maximum length of railway tracks - meters
Vado L.	3	0	450
Verona	18	31	600
Trieste	6	6	450
Trento	9	9	720
Torino	4	3	600
Rovigo	6	4	500
Rivalta	5	5	440
Prato	8	3	600
Portogruaro	6	3	478
D'Abruzzo	5	9	680
Parma	3	14	625
Padova	17	21	690
Orte			
Novara	12	0	550
Nola	7	13	750
Mortara	3	4	650 (525)
Marcianise	10	3	520
Livorno	2	2	600
Cervignano	8	1	500
Catania			
Bologna	17	4	750
Bari	16	27	600

Source: CERTeT on UIR data, Note: Orte and Catania are not linked to the main rail network

4. Freight transport in Italy – traffic data

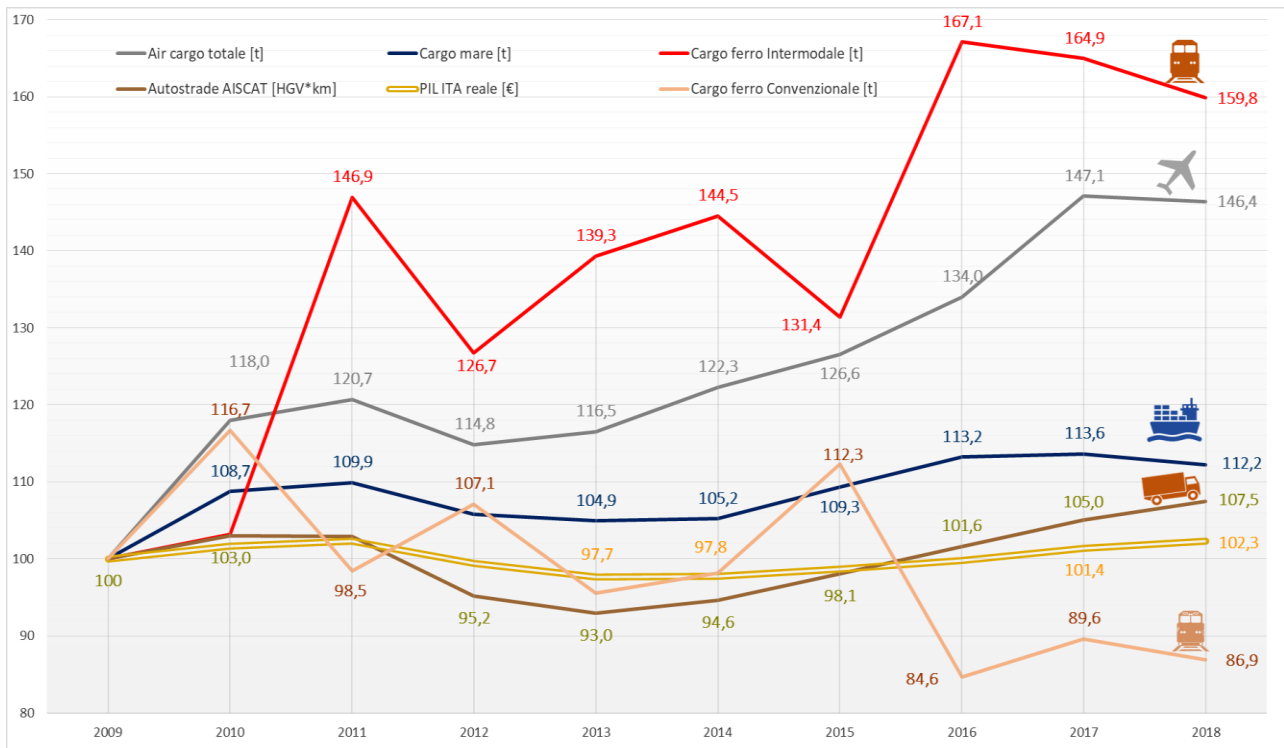
4.1 Long term (2009-2018) trend of freight traffic in Italy

In the ten-year period 2009-2018, characterized by the economic crisis of 2009 and the sovereign debt crisis of 2011, it can be seen from the chart below, with values indexed 100 for the year 2009, that the real Italian GDP grew by only 2.3 basis points and reached pre-crisis levels only from 2016. In detail, the slow recovery of GDP can be ascribed substantially to the increasing degree of internationalization of the Italian economy and therefore to export which were the counterpart of the still low levels of domestic consumption and investments.

As a corollary to this, it can be seen that the highest growth rates over the decade have been recorded by the intermodal railway traffic and by the air cargo, although they represent a very limited market share of the Italian freight transport. On the other hand, conventional rail freight transport is still significantly lower than in 2009 and the trend of the last years shows no sign of reversing.

With regard to maritime cargo traffic, despite two years of negative rates between 2011 and 2013, it has resumed a slow growth that seems to have stopped in the last year. Just like long-haul freight transport in the motorway sections, these two modes seem, at different rates, to trace the trend of the real GDP.

Figure 11 – Long term 2009-2018 trend of real GDP and freight traffic in Italy [index values 100=2009]



Source: RAM elaboration on ISTAT, Assaeroporti, AISCAT, AdSP, RFI and Eurostat data.

4.2 Medium-short term (2014-2018) trend of freight traffic in Italy

In the period analysed (from 2014 to 2018) there is a steady growth of the freight transport, except for the last six months of 2018 since there are some treats that are scaring the Global market (e.g. Brexit). The best performance in this period are scored by the air transport, followed by the road transport, especially for the express courier sector. This trend is pushed by the e-commerce since the Italian customers are buying more and more on national and abroad websites. In addition, the maritime transport is growing but its performance are under the pre-crisis level, especially for the negative results of Cagliari, Gioia Tauro and Taranto ports. After a positive trend of the first two years (2014 and 2015), the railway transport is scoring a performance quite negative (-0.4%) in the 2018. The negative trend of the last years affects the forecasts that foresee steady results for 2019.

The positive trend of the Italian goods sector detected in the first half of 2014 has been strengthened in the second half year, keep increasing year after year with positive results both in terms of traffic and turnover in all the transport modalities. The air cargo scored the best results (+6.7% weight carried, +4.1% number of shipping and +4.7% turnover), overcoming the pre-crisis results. On the other hand, the liquid bulk (-6.4%) and solid bulk (-1.1%) achieved the worst results of the sector. The substantial increase of the national transport market (+2.1% of FTL and +1.3% of Groupage) seems to be the sign of a recovery of the internal consumption of the families and of companies' investments.

It is important to point out that the recovery of the rail freight (+600,000.00 train/km that means +1.4%) is due to the growth of different railway undertakings, which are absorbing the Trenitalia's market shared. In addition, the steady increasing of the courier sector is notable (+3.8% volumes and +3.5% turnover), towed by the e-commerce that is keeping a double-digit growth, doubling its value in only four years. The positive trend of the freight traffic is confirmed both by the ratio traffic/revenues that is basically balanced and by the decrease of the days sales outstanding (79 days against 87 in 2013) and of the unpaid debts (1.2% against 2.4% in 2013). In the international shipping sector, not only the air transport is grown. In fact, both the road (+2.5% volumes and +2.8% turnover) and maritime transport (+1.9% volumes and +1.7% turnover) are increased.

The positive values collected by Confetra confirm the data coming from the Alpine passes (where the Brenner performance of +3.8% is closed to the Monte Bianco one) and of the airports where Malpensa with a result of +9.1% has strengthened its leadership on a static Fiumicino (-0.3%). In addition, the motorway traffic reached a result that is finally again positive, after a three-year decline. The growth of the container traffic of Port of Genova (+9.3%) and of the RO-RO port of Livorno (+7.8%) is noteworthy.

For the second consecutive year, **in 2015 the Italian traffic trend of the goods is positive** both for the carried volumes and for the revenues, except for the transshipment that is moving back (-10%). Air cargo (+5.1%) and courier sector (+8%) keep increase thanks to the unstoppable development of the e-commerce. Other good results are given by the road transport, both national (+3%) and international (+2.7%), confirmed both by the raised motorway traffic (+3.3%) and by the Alpine passes traffic (+2.5%). In addition, the rail freight transport scored a positive result (+2.6%). Then, the international shipments raised both in the maritime (+3.4%), road (+3.1%) and air (+2%) sector. However, the trend of the all transport modalities keep to be worrying compared to the maximum levels reached in 2007. Only the air cargo has overcome those values while road and sea transport are 13% and 40% below respectively.

The recovery of the freight transport sector is carrying on slowly in 2016. For the third consecutive year, the traffic trend raises in all its modalities although only the air transport scored a real higher performance compared to pre-crisis levels (2007). In particular, the growth of the air transport (+7.4% in 2016) has reached the highest levels of the second half year, showing that the peak season is in the last months when the provisions of goods raise for the Christmas period. This data is confirmed by the number of aerial shipping that scored a +4.5% compared to 2.3% of the first half year. There is a reverse trend for the road sector despite its significant growth (+4.4% in the international FTL, +4% in the groupage and +2.6% in the domestic market) because had a slowdown compared to the first half year. The same goes for the maritime transport because the growth of the first months has not continued except for the transshipment sector, thanks to the positive results of the Gioia Tauro port (+9%). The liquid bulk had a slight decrease compared to 2015 (-0.4%) but it seems linked to the turnover of the oil product stocks rather than a real reverse trend. Conversely, the growth of the rail transport is noteworthy since it has increased in the first half year from +3.8% to +4.1%. It is a sign of the recovery of the sector thanks to the incentive of the Govern that is showing the will to foster the rail transport through the so-called "iron-care". Good performance for the courier sector that scored +3.5 on the national shipments and +6.5% in the international market. These results are coherent to the productive trend to reduce the stocks, to promote the just in time and to increase the e-commerce.

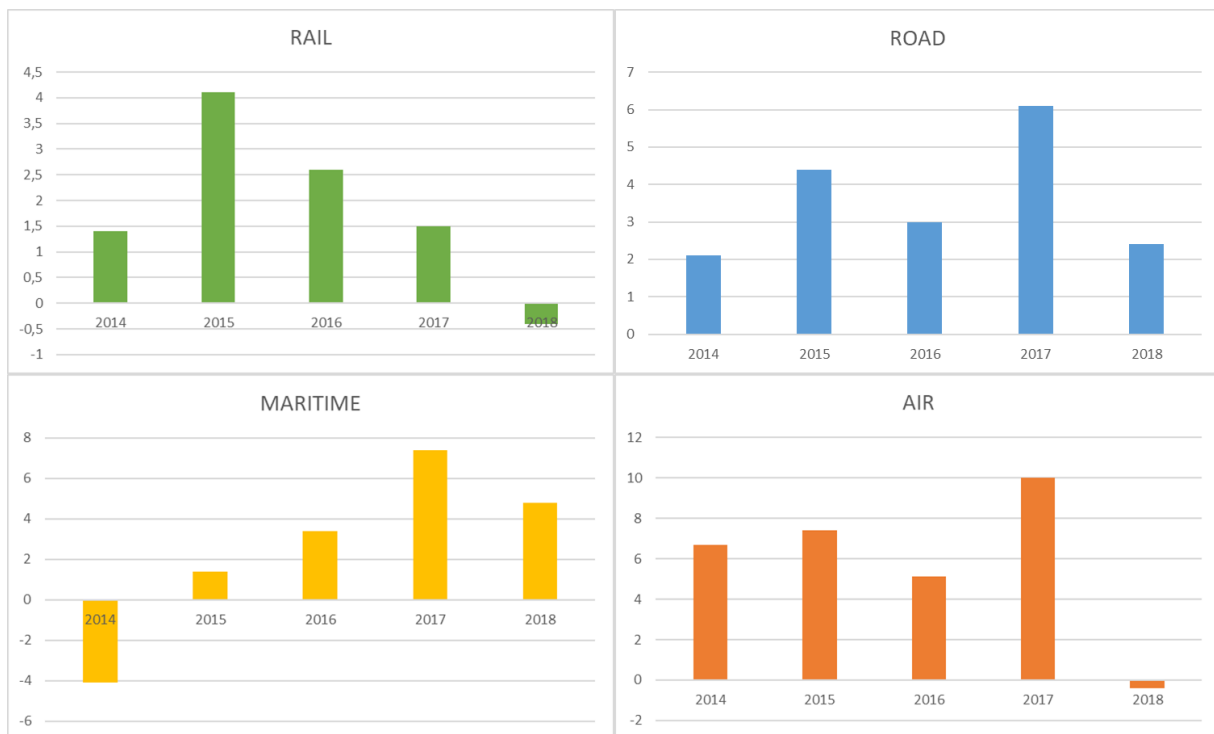
Analysing the revenues, the road transport and the courier sector show a recovery that can mean the end of the crisis. However, the international shipments, especially the air and the maritime ones are undergoing the contraction of the rental fees. From the financial point of view, the ratio between unpaid debts and turnover is getting better (1% more than +1.2% of the first half year) but the days sales outstanding (DSO) are increased a little bit from 78.5 of the first half to 79.4 days at the end of the year.

The **Periodic Economic Note of 2017** shows overall increases both of traffic and of turnover compared to 2016 that has been a positive year. The only negative results regard the transshipment sector since the bad performance of most important ports operating in this sector that are Gioia Tauro and Cagliari. In addition, there is a negative performance of the solid bulk caused by the port of Taranto involved in the Ilva's crisis. On the other hand, there is an increase of the revenues of the maritime and air sectors, thanks to the positive stabilization of the rental fee level. Good performance of the express couriers, thanks to the steady growth of the E-Commerce that in 2017 benefitted of the increase of Italian web shoppers (+10%) and of the purchases from Italian sites (+17%).

The **Periodic Economic Note of 2018** shows a slowdown of the growth of all the transport modalities. This trend started in the middle of the first half year and followed the industrial production trend detected by the ISTAT: in the first six months, the average growth was +2.7% and in the second half of the year -1.3%. Therefore, the annual average growth was +0.7%. Simultaneously, the forecasts of Global Trade have been weakened since the last evaluations of the Italy Bank foreseen 3.5% in 2019, more than 2 percentage point less of 2017. This negative performance is due to several factors, like the business negotiation between USA and China, the Brexit and the slowdown of China's economic activity that produced a growth of +6.6%, the lowest from 1990. In the first half year, the sector that have suffered less of this trend is the road transport despite its growth is decreased. The transport performed by truck scored +2.4% in the groupage and +2.5% in the international FTL (in 2017 the performance were respectively +6.1% and +6.5%), confirmed both by the motorway traffic raised of 2.6% in the first eleven months and by the crossing growth in the Alpine passes of 3.3%. On the other hand, the transport performed by van scored +2.5% in the domestic shipments (in 2017 was +3.5%) and +4.0% in the international routes (in 2017 was +6.9%) that is due to the steady growth of the

e-commerce. In fact, the on line purchases in Italy on national and international sites reached 27.4 billion of euro. Unfortunately, both the railway (-0.4 trains per kilometre) and the air cargo (-0.4 tons) scored a negative result, producing a sharp breaking compared to the forecasts. For instance, Malpensa has a negative result of -3.2% while Fiumicino had a growth of +11%. Moreover, the sea transport got worse than 2017 and 2016. The container traffic in 2018 was +4.8% (+7.4% in 2017). The Ro-Ro traffic reached +2.5% in 2018 but in the first six months was 4.7% (in the same period of 2017, it was 8.1%). Furthermore, the liquid bulk (-1.0%) and solid bulk (-4.6%) scored negative results but the worst performance is reached by the transshipment (-10.1% in 2018, -10% in 2017). In fact, both Cagliari (-56.3%) and Gioia Tauro (-4.9%) keep scoring negative trends.

Figure 12 - Medium Short term 2014-2018 trend in freight traffic [maritime includes only container gateway traffic]



Source: Confetra – Note congiunturali semestrali

All the data represented in the maritime diagram are referred only to the gateway traffic and especially to the containers handling. In fact, in the transshipment ports there is only the movement of the loading unit from a vessel to another one so this type of traffic represents only a marginal part of the national freight transport throughput. For the same reason, the focus of the analysis was the containers traffic since they represent the most significant part of the maritime activity.

On the other hand, the railway diagram represents the entire railway sector. Deepen into the analysis, it is possible to split the intermodal and the conventional railway traffic. From 2015, there is an important growth

of the intermodal sector. It is a positive signal since Europe is pushing this sector to reduce the use of the road transport. In fact, the loading units carried by truck can be easily loaded on a train using cranes. In this way, a clean vehicle like the train will perform the longer stretch of the route. Lastly, the road and the air transport have a similar trend. After a positive 2015, the 2016 recorded a slight reduction in 2016 due to the raising of the e-commerce and of the reduction of the stocks. Then, 2017 was the best year thanks to the steady good performance of the e-commerce sector. Unfortunately, Brexit and China slowdown has affected negatively the market, reducing the growth and the performance of the both transport modalities.

5. Major transport investments in Italy (2030 target) for future freight transport scenario

5.1 Railways

The Market Plan of RFI starts its analysis on the European context and the map of the TEN-T corridors crossing Italy. The analysis carries on with the identification of the freight markets and areas that generate the demand. In fact, the 90% of the freight transport that nowadays is developed in our country is flowing along these corridors, which will be described in the following paragraphs.

The infrastructure manager has created a standardized process called “Market Observatory” that consists of a steady comparison among the customers to control their satisfaction.

The input analysis heads to the detection of the following objectives:

1. to strengthen the offer for the railway undertakings operating in the freight market;
2. to improve the condition of the enterprises operating in the railway yards (railway undertakings and terminal managers) to reduce the costs of the service offered;
3. to optimize the assignment of the railway paths and to enhance the compatibility of the freight traffic with the other businesses.

In addition, the achievement of the goals of the Reg. UE 1315/2013 concerning the links among port authorities and the infrastructure manager must be pursued by a set of actions described in this document.

The performance - The GABARIT

Following the other European Infrastructure Managers, RFI has started an upgrading plan in order to adapt the National Network to interoperability technical specifications. These requirements are infrastructural standards that every network must have to allow the movement of the trains owned by the railway undertakings on the entire European network without limits.

The technical specifications must be applied:

- when new railway lines or their components start their activity;
- in case of the restorations: it is when a subsystem or a part of it is modified in order to change the performance;

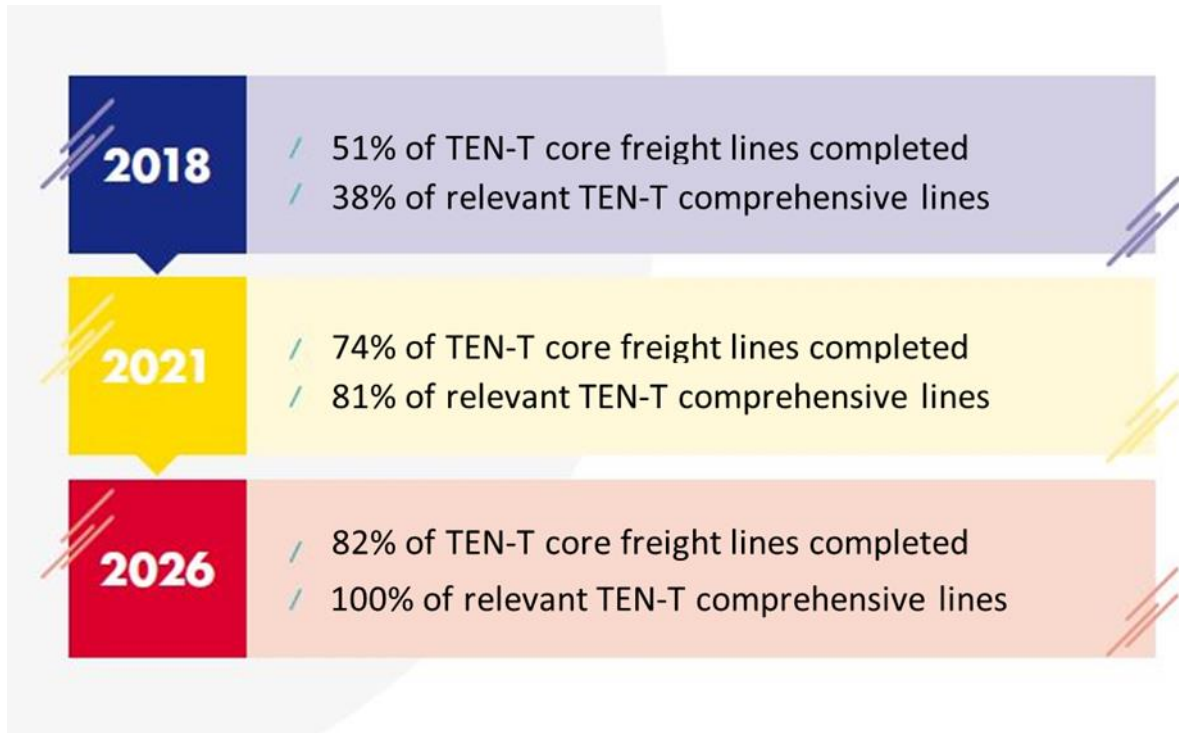
- in case of renewals: it is when a subsystem or a part of it is substituted but the performance do not change.

Each interoperability technical specification is defined by ERA (European Railway Agency) on behalf of UE. Then, UE endorses them through specific decisions and regulations. Therefore, for each interoperability technical specification there is a specific decision that deepens the technical details.

From the performance point of view, it is clear the gradual reduction of the railway gabarit from the Baltic and Eastern Europe countries to the Mediterranean Sea. However, the European network has a widespread diffusion and a good level of infrastructure in the European area.



At the end of 2017, the TEN-T line covered by the PC80 Italian standard (that is the same of P400 in Europe) is 40% for the core and 26% for the comprehensive part. The works in the first scenario are focused on the completion of the main stretches on the north-south direction that are Milan-Bologna, Adriatic and Tyrrhenian. In 2018, the works on the Bologna-Prato will start and they will be finishing in 2021. The impacts on the railway functioning are relevant so has been set up a specific agreement with the Emilia-Romagna and Toscana regions in order to manage the three year of works.

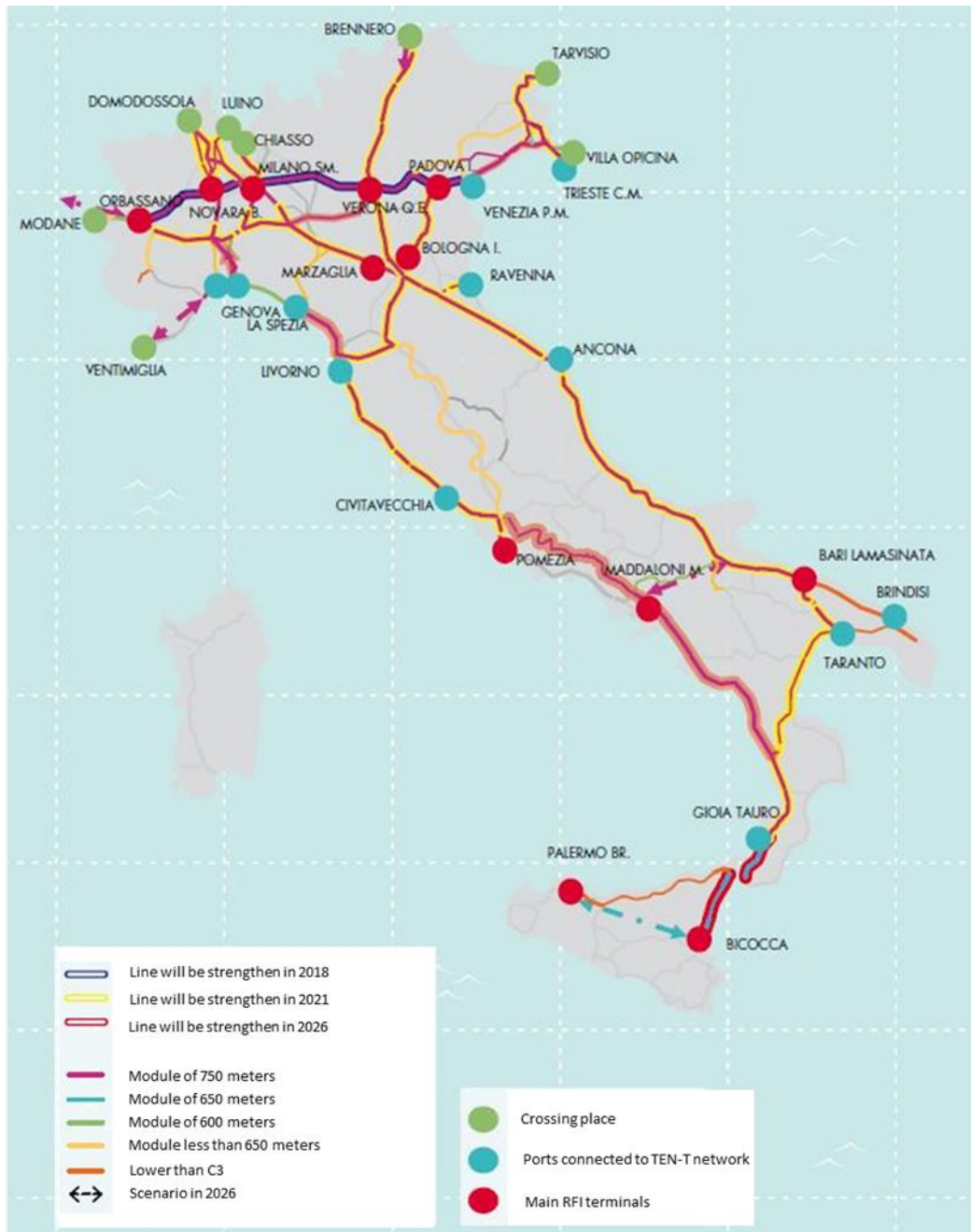


The performance - The train length

This chapter analyses the maximum length of trains allowed on the network, avoiding to create problems for the other trains and to congest the overall network performance.

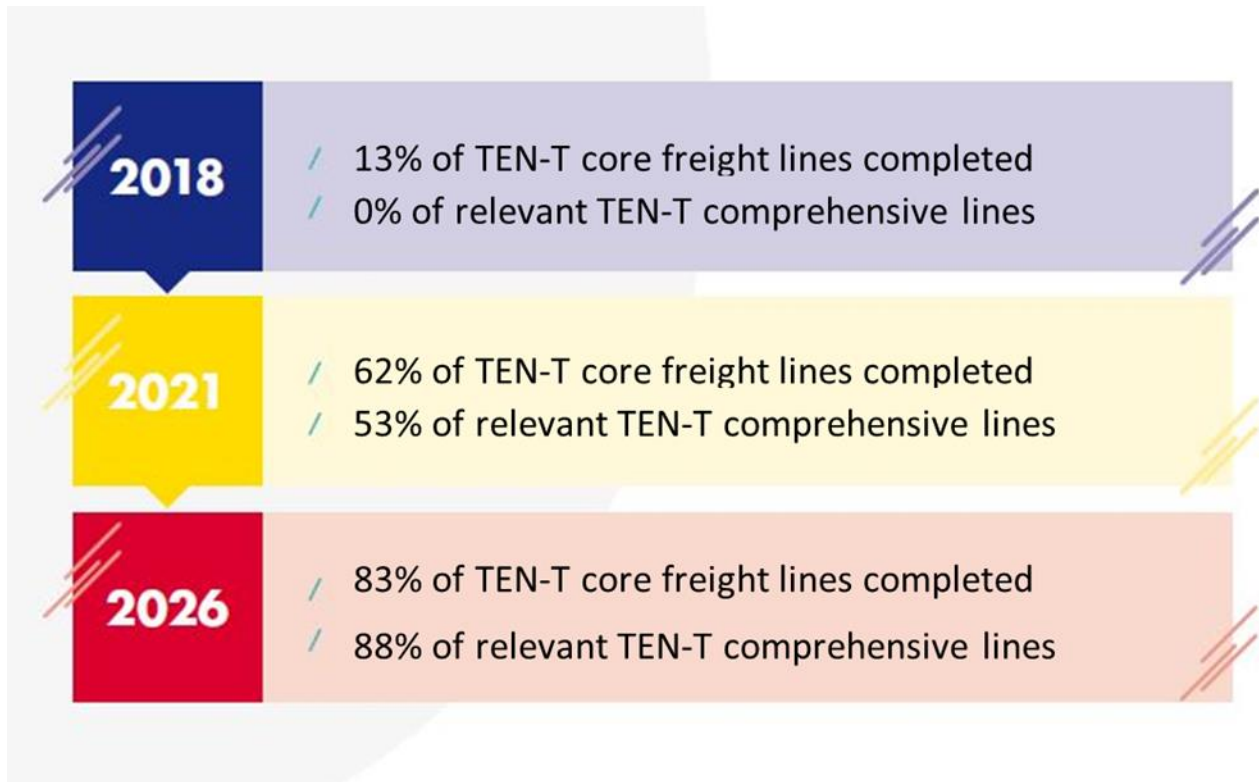
The train length value is based on the physical limits of the infrastructure like the length of the railway station's tracks, the terminal area and the shunting area.

The European Member States define the strategy by relying on the potential circulation of the "long" freight trains, checking the opportunity to make 750 meters long trains according to the last needs of the combined transport market.



The request of the railway undertakings to manage trains 750 meters long is recent. Therefore, the National Railway Line has not lines with this standard in 2017. In 2018, the works are concentrated on the Bologna-Brennero stretch and on the Chiasso crossing place on which there is the passage of the majority of the railway freight traffics. The objective is to have the half of the network with this stand in 2021. The works will be concentrated on the Adriatic and Tyrrhenian lines because are the main connections for the freight

traffic from north to south (and vice versa). The long-term objective is to arrive at the end of the industrial plan with this standard implemented on the 90% of the entire network.

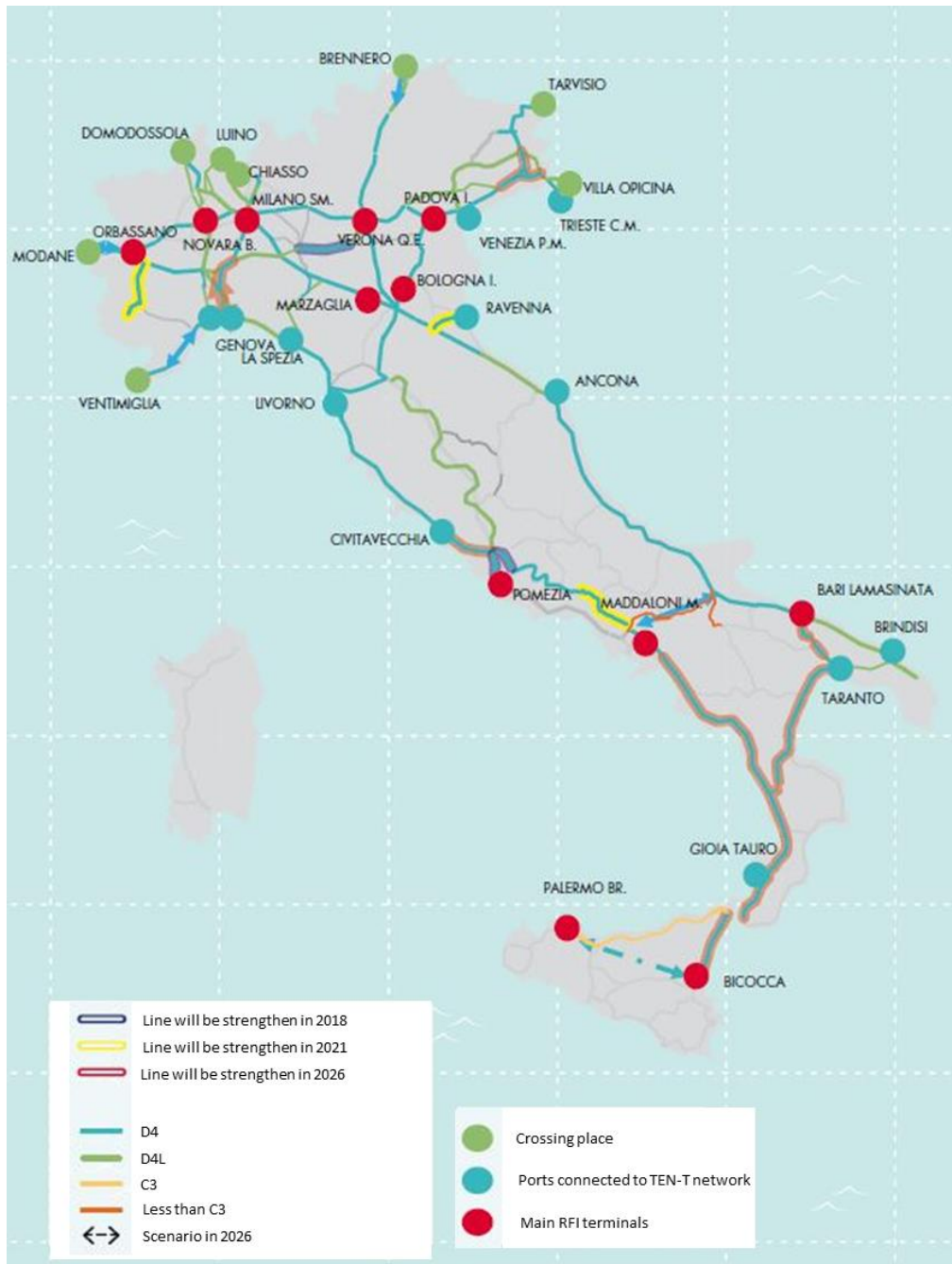


The performance - The AXLE LOAD

The railway lines have been classified according to the maximum weight that each axle and linear meter can sustain.

- The axle load means the mass of the vehicle that weights on each axle of the train. It is calculated dividing the total mass of the vehicle for the number of axles.
- The mass per linear meter means the mass of the vehicle that weights on each space one meter long occupied by the vehicle itself. It is calculated dividing the total mass of the wagon for its length measured from the buffers edges when are not working (not compressed) and it is expressed in meters.

The ranking of a specific railway line is binding both for the load limit and for the speed allowed on the network. The common standard requested from each corridor is of 22.5 tons for each axle of D4 category.



The national railway network has already covered with the D4 standard. However, important works must be realized on the Tyrrhenian line. Other works are concentrated on the lines outside the main corridors but are links from the main national companies to the network, like Cava Tigozzi and Racconigi steel mills. Lastly, the southern lines will be upgraded since currently there is a relevant performance gap to the northern ones.

5.2 Roads and Motorways

According to the framework contract of ANAS, the strategies to improve the road network are divided into priority programs focused on the entire network and priority works concentrated on the roads and motorways directly linked to the development of the TEN-T network. In the following rows will be listed the priority programs for the 2016-2020 period.

Enhancement of the road heritage

One of the issues of the road infrastructure system is the age of the network. Therefore, are promoted the actions aimed to enhance and maintain this network. In addition, the improvement of the road safety and the reduction of the car accidents will be pursued through several works that are focused on the adaptation of the road network to the current standards, on the adjustment of the existing stretches and on the improvement of the protection barriers.

Technological strengthening and digitalization (Smart Road)

Following the defined strategies, the deployment and dissemination of the infrastructure digitalization (it is included the innovative monitoring of the infrastructure through the use of sensors) is one of the essential priority programs to achieve the predetermined objectives.

Renovation and safety works for the infrastructure with risk of earthquake

The role of the road network is essential for the management of the emergencies caused by the high risk of earthquake in the national territory. Throughout the years, some important actions have been developed, as the safety works of the area affected by an earthquake which must be deployed through preventive measures to face this problem with a focused planning.

Decongestion and fluidification of the motorway stretch

Within the suburban zone, several works are planned to strengthen the current viability and to realize new connections able to make the traffic uniform on the network. The third and fourth lane on the motorway can give an example of this planning that aims to overcome the current operative conditions of the network in order to sustain traffic peaks for many hours per day in strategic stretches.

Decongestion of the metropolitan areas

As far as to be concerned the congestion of the urban areas and their limited accessibility, the strategies at the national level attribute more importance to the systems of sustainable mobility, especially to the railway services in the metropolitan area. Consequently, the road system in the urban areas must guarantee mainly the by-pass function. The foreseen solutions for the main urban nodes are concentrated on their strengthening, acting chiefly on the traffic sorting system.

Planned Italian motorway works

The Italian Ministry of Transport has planned all the works necessary to improve the road and the motorway network. However, it is important to make a different analysis for the roads and the motorways since there is a different distribution of these two networks on the Italian territory. In fact, there are many motorways in the northern Italy because is the zone more industrialized. On the other hand, the road network has a smooth distribution on the Italy surface despite there is smaller concentration of roads on the south caused

by the low level of development in the area. For this reason, the majority of the investments on the road network are concentrated on the south. For instance, the upgrade of the connection between Caltanissetta and Agrigento (called SS 640 road) will cost 1.535 million of euro. Another huge planned intervention is the connection between the SS 106 road and the SS 534 that will cost 1.234 million of euro. The overall costs of the intervention on the south section of the road network are 5,800.18 million of euro. The sum of the all works planned in the north (2,082.60 million of euro) and in the center (2,048.45 million of euro) of Italy does not reach this amount foreseen for the south. Analysing the motorway network, there is a reversal of the of the investment's concentration. The reason is the number of motorways currently built. In fact, the distribution of the motorways in Italy is twenty-three in the north, six in the center and seven in the south. It is clear why the investments are higher in the north. Only the Pedemontana Veneta and Pedemontana Lombarda will absorb an important share of the investments foreseen (2.258 and 2.681 million of euro respectively). The concentration of the investments in the north is not only due to the proximity to the neighbour's countries. In fact, there is also a different territory. Unfortunately, in the north there are not mountains except on the country borders (Alps). Conversely, in the center and in the south of Italy there are the Apennines Mountains that make difficult to improve the existing infrastructure or to create new ones. In fact, the creation of faster roads like the motorways entails to make routes as straight as possible. Therefore, there is the need to build tunnels and bridges to cross and overcome these mountains. All these reasons make more attractive the motorway investments in the north of Italy. Despite these disadvantageous conditions, the aim of the Italian Ministry of Transport is to strengthen the network in the entire territory, creating a widespread transport system. Notwithstanding the different features of these two networks (roads and motorways), the works aimed to improve both systems can be classified in five macro areas:

- Promotion of the existing road assets (the investments foreseen are 12,052.97 million of euro);
- Digital and technology upgrade (the investments foreseen are 198 million of euro);
- Reactivation and securing of the infrastructure with seismic risk (the investments foreseen are 11,256.42 million of euro);
- Decongestion and fluidification of the motorway routes through the creation of the third and fourth lane (the investments foreseen are 1,256.65 million of euro);
- Decongestion of the metropolitan area (the investments foreseen are 7,370.87 million of euro)

The analysis above is the evidence of the lack of infrastructures that distinguishes the southern Italy. For this reason, these interventions are essential to create a unique and efficient network able to provide a high level of service to the users. Adequate connections among the different cities and towns are important to develop all the areas of Italy. In this way, the country will be able to compete in a market more and more globalized in which the punctuality and the door-to-door delivery are become essential elements.

5.3 Ports

Nowadays, the overview of the existing maritime infrastructure shows some gaps that must be filled in order to compete with the other European ports. The following analysis is based on the list of the planned works over 5 million of euro. The best way to understand the future improvements is to talk about each System Port Authority separately since the physical interventions foreseen are different.

The description of the next lines will make possible to compare the different areas of the country, highlighting the different problems to solve.

- ◆ Following a geographic order, the first Port Authority to mention is the Port Network Authority of the Eastern Adriatic Sea. It involves only Port of Trieste. The main important work regards a new logistics hub between the yard for the timber and carriage free for mineral oils, which cost is 131 million of euro. Other works foreseen regard especially the upgrades of the piers and a new layout of the port. The sum of all the planned works is about 206 million of euro.
- ◆ The second Port Authority analyzed is North Adriatic Sea Port Authority. It involves both the Port of Venice and of Chioggia. The most important work is the realization of a new cruise terminal for 63 million of euro. Other important works are the construction of a railway bridge, the restoration of historical buildings to create new offices for the Port Authority and the extension of the quays. All the works will cost about 170 million of euro.
- ◆ Moving on the western part of Italy, there is the Western Ligurian Sea Port Authority. It involves the Ports of Genova, Savona and Vado Ligure. The huge work planned is the construction of a new container terminal and the connected interventions for the reorganization of bulk terminal and of the piers for the mooring of the ships with petroleum products. The cost foreseen is about 281 million of euro. Other important planned works are the realization of a road connection between the port and a dedicated dry port, the extension of the existing container terminals, the dredging of the seabed and the creation of a new customs clearance. All the work in the port Authority area will costs about 426 million of euro. It is worth mentioning the feasibility study currently undergoing for the new
- ◆ Another Port Authority closer to the previous one is the Eastern Ligurian Sea Port Authority. It involves Port of La Spezia and of Marina di Carrara. The most important intervention is the improvement of the functional interface used for the link between the port and the city. The expected costs are about 35 million of euro. Other important works are the dredging of a basin close to the piers, the improvement of the logistics platform connected to the dry port, the digging out of the depths and the upgrading of the old buildings to use them for nautical activities. The overall cost for these works is about 145 million of euro.
- ◆ In the center of Italy on the Adriatic Sea, there is the Eastern Center Adriatic Sea Port Authority. It involves only Ravenna Port. The bigger works regard the realization of a new terminal and the connected adaption of the quays and the dredging of the channels. The cost is about 235 million of euro. The other important works in the area are focusing in the restoration of the operative quays. All the works will cost about 311 million of euro.

- ◆ Close to the Eastern Center Adriatic Sea Port Authority there is the Center Adriatic Sea port Authority. It involves only port of Ancona, Falconara, Pescara, Pesaro, San Benedetto del Tronto and Ortona. The works regard only the maintenance of the seabeds and the overall costs are about 27 million of euro.
- ◆ On the opposite coast, there is the Northern Tyrrhenian Sea Port Authority. It involves Livorno, Piombino, Portoferraio and Rio Marina Ports. The most important work regards the construction of a new dockyard using about 30 million of euro. Other important interventions are focused in the realization of a new logistics site, the extension of the existing containment basin and the construction of a new warehouse for cellulose. The sum of the all work costs is about 161 million of euro.
- ◆ Some kilometers above the previous Port Authority, there is the Northern Center Tyrrhenian Sea Port Authority. It involves Civitavecchia, Fiumicino and Gaeta Ports. The bigger investments are necessary to realize a dockyard used for shipbuilding industry (cost 509 million of euro), a commercial harbor (cost 251 million of euro), the extension of a quay (87 million of euro) and to build a connection bridge (83 million of euro). Other interventions are foreseen like the realization of a new access to the historical basin, a new viability and the construction of new yards. All the works will cost about 1,518 million of euro.
- ◆ Moving on the southern Italy, there is the Center Tyrrhenian Sea Port Authority. It involves Naples, Salerno and Castellamare di Stabia ports. The biggest work regards the realization of the road connection between the Port and the Salerno-Reggio Calabria motorway. The cost is about 110 million of euro. The other important works concern the designing of the Salerno commercial harbor, the extension of a pier, the renovation of a basin and the realization of a port-integrated system. The sum of all costs is about 439 million of euro.
- ◆ On the opposite side, there is the Southern Adriatic Sea Port Authority. It involves Bari, Brindisi, Manfredonia, Barletta and Monopoli Ports. The works are focused on the extension of the quays and on the renovation of some areas to create buildings for the Port Authority. The bigger works are the upgrading of the quays and of the seabeds in order to manage the ferries, the Ro-Ro vessels and all the sea motorways traffic arriving at the ports (the expected cost is 55.5 million of euro). Other important works are the completion of the connection between the petrochemical plant and the coasts (39.325 million of euro), the completion of the quays in the Saint Apollinare area to manage the Ro-Ro vessels and the ferries (35.5 million of euro) and the construction of a central offices and some port warehouses (31.5 million of euro). The overall costs for the interventions are 320 million of euro.
- ◆ In the same region of the previous Port Authority (that is “Puglia”), there is the Ionian Sea Port Authority. It involves only the Port of Taranto. The biggest intervention is the construction of the intermodal terminal and its cost is 219 million of euro. Other important works regard the steps necessary to realize a pier able to manage different commodities sectors. The costs expected for the different phases are 83, 81 and 75 million of euro. The costs sum for the all works are 744 million of euro.
- ◆ The last port Authority analyzed is the Stretto Port Authority. The Italian name “Stretto” is given for the proximity to the Strait of Messina, the narrow channel between Sicily and Calabria region. It

involves Gioia Tauro, Crotone, Corigliano Calabro, Tauretana di Palmi, Villa San Giovanni, Vibo Valentia, Reggio Calabria, Messina, Milazzo and Tremestieri Ports. The bigger work is the construction of a new logistics platform in Tremestieri Port and the cost expected is about 75 million of euro. Other important interventions are the construction of a dry dock (40 million of euro), the realization of a road to connect the railway to the port (27 million of euro) and the creation of an industrial pier (25 million of euro). All the works in this Port Authority will cost about 321 million of euro.

The data for the Catania and Palermo Port Authorities are missing so it is not possible to make an evaluation on these two entities.

6. Initiatives for the digitalization of transport in Europe and Italy

The regulatory and strategic planning framework envisages programmed interventions and common guidelines about the digitization of the logistics chain. Therefore, the mapping of the main initiatives is to be considered mainly within this field of application where economic and financial supports help design on two interconnected levels: European and national.

In Europe, the transport technological innovation issue is expressly mentioned in the EU Regulation 1315/2013 on the trans-European transport network (TEN-T), describing it both as a general horizontal priority (art. 10) as a specific priority for each transport mode (art. 23). More specifically, the Regulation mentions that the TEN-T network "*should provide the basis for the large-scale introduction of new technologies and innovations, which, for example, could help improve the overall efficiency of the transport sector in Europe and reduce its carbon footprint*".

The objectives of technological innovation in transport are the following:

4. to allow the decarbonisation of all modes of transport by promoting energy efficiency
5. to improve the safety and sustainability of the mobility of people and the transport of goods
6. to improve the functioning, management, accessibility, interoperability, multimodality and efficiency of the network.

At European level, innovation and new technologies are declined both in the field of digitalization and decarbonisation, where the effects can often be combined. Although the main aspect remains digital and technological innovation and information technology for logistics and transport. The development of innovation and technology in transport is reflected concretely into telematic applications for management, signalling and traffic safety by transport modes (ERTMS for the railway network, VTMS for maritime transport, ITS for the roads, RIS for the waterways and SESAR for the aviation sector) and in instruments that can guarantee the interoperability and the integration between the IT systems used in the different modes of transport.

6.1 Main ongoing initiatives

Consistently, the CEF Transport 2014-2020 allocates important resources to the priority "technological innovation and digitalization", considering it a dedicated financing resource in each call and a horizontal priority (therefore the financing for digitization and ICT systems can also be part of actions co-financed in

other priorities, e.g. MoS, Core Nodes, etc ...). CEF Transport 2014-2020 program has allocated significant amounts to projects and actions with Italian beneficiaries in the 2014-2017 period which sum to 30 projects (mostly multi-beneficiaries) for a total budget on the Italian side exceeding 328 Mln € and a related European co-financing of over 130 Mln€.

Another 9 projects with the participation of Italian beneficiaries in the field of ICT innovation and digitalization were approved during the last CEF-T call for proposal 2018 for investments of over 152 Mln € with a European co-financing of approximately 75 Million €. Additional European funds for transport innovation and digitalization for the 2014-2020 programming period can be found in the Horizon 2020 programs (research and development), in the European Territorial Cooperation programs (INTERREG) and in the European Structural Investment (ESI) Funds.

Coming to the national level, the 2015 National Strategic Plan for Ports and Logistics is the basic tool for strategic planning of the maritime sector aimed at improving the competitiveness of the Italian logistics system. The theme of technology, innovation and digitalisation in transport is set out in the following points:

- Action 1: measures for the simplification and speeding up of procedures, controls and interventions on ports of national interest
- Action 6: measures to encourage research, development and technological innovation in Italian ports. Specifically relating to activities:
 - 6.1. Digitization of the logistic chain,
 - 6.2. Promotion of structured research collaborations between AdSP and research and development centers
 - 6.4. Legislative measures to consolidate the dissemination of the National Logistics Platform

Subsequently then in the annexes to the DEF 2017 and 2018, the infrastructural planning of transport expressly foresees in the program the theme of the digitization of the logistic chain and ICT as well as the fact that there is a mapping (state of the art) of the existing in terms of technological innovation in Italian logistics and ports.

6.1.1 UIRNET

UIRNet is a company governed by public law which, as a result of specific regulatory provisions and conventional agreements² with the Ministry of Infrastructure and Transport (MIT), operates as the sole implementing body of MIT for the creation and management of the National Logistics Platform (PLN), as defined by the Ministerial Decree 20 June 2005 n.18T.

The PLN should represent the main Intelligent Transport System (ITS) for the management of the national logistics network, aimed at allowing the interconnection of the intermodal nodes (ports, freight villages and logistic platforms) in an efficient and safe way. With the PLN the operators, through a common digital language, will be able to exchange information in real time to agree, verify, schedule freight transport. The goal of UIRNet is to put the various actors of the transport and logistics sector in a simple way, without

² MIT has signed 3 Agreements with UIRNet (PLN, PLR and Security) for a total funding of about € 50M

introducing market changes induced by the offered services and without privileging one or the other category of operators.

Now, UIRNet has completed the implementation of the core services of the PLN and through a tender procedure has selected the economic operator Logistica Digitale (DXC Technology company, Vitrociset SpA and FAI Service Società Cooperativa) for the awarding of a concession of services concerning the extension and management of the PLN (including the dissemination of services and application modules on the market) for a period of 20 years starting from 1 April 2017, according to the project finance scheme pursuant to 'art. 278 of the D.P.R. 5 October n. 207. UIRNet and the MIT - Department for Transport, Navigation, General Affairs and Personnel, on 06.20.2017, have also signed a Memorandum of Understanding (n. 1157/2017) with which they have shared at institutional level the objective of creating the connection of the Ports to the PLN.

The multi services to be made available ranges from the Port Community System to the Freight Village System to the Unified Access Card for all Italian Ports and freight villages, up to the Dangerous Goods tracking services. In order to achieve the set objectives and considering the aforementioned Memorandum of Understanding, some of the national ports are in the process of joining the PLN (Genoa airport first), agreeing to adopt the PLN services related and / or instrumental to the PCS, as well as system interfaces, while the situation is continuously evolving.

Given that PLN over the years has designed and developed a series of services that generally correspond to transport needs, the following are those in line with the requirements defined and envisaged by the MUPCS, as they are useful and complementary to the achievement of results for the simplification, speeding up and monitoring of maritime / port and intermodal services:

- Access, registry and access control permissions.
- Booking (reservation): this function allows the recovery and management of "mission" data, to book the loading / unloading operations as a forecast in favour of the terminal operators, warehouses, warehouses; for the possible use of parking areas; and - arriving at the Logistic Node - to facilitate the immediate access of the vehicles from the gates and gate, having verified in advance (through the PCS) all the authorizations and permissions that allow entry.
- Operational Alerts: in case of forecasts and / or presence of queues and traffic to the port accesses, the MUPCS with its Institutional PCS also provides the PLN with such information, so that the PLN itself - which monitors the means directed to the Ports and / or specific gates - may inform the Carriers concerned (and with their authorization the drivers of the vehicles) to avoid the gathering and queues at the entrance to the port entrance concerned.
- Control Tower ("Advance notice"): allows a Node to have accurate and real-time information about the vehicles traveling to it. Operators and infrastructure managers can know for each individual vehicle the estimated time of arrival (ETA), be informed about advances / delays with respect to the planned arrival (see booking). The Node can also have aggregated information: number of vehicles arriving by time slot and, therefore, be able to forecast overall traffic concentrations for each Node and entry gaps even if multiple.

- Parking areas management: The service is oriented to parking and buffering area managers, through the provision of support functions for management activities for each type of parking area and buffering for truckers (port and motorway).
- Fast Corridor referred to in the following section

6.1.2 Custom Agency

In the recent years the key player in the digitalization of ports has probably been the Customs and Monopolies Agency, which has implemented important projects based on intangible infrastructures, on the commitment of new technologies, on electronic tracking of goods for simplification of the import / export cycle and for the decongestion of port spaces. Between these:

- **The pre-clearing:** The procedure, which works in synergy with the new single customs window, allows even before the arrival of the ship and docking at the dock, to carry out not only all the safety and security checks of the ship's cargo, but also to anticipate the complex administrative procedure of the customs clearance of goods and the consequent payment of customs duties. All this takes place via telematic dialogue, based on precise IT protocols, between the Customs Authority, the Maritime Authority, the shipping companies, the Container Terminal managers and the operators, ie importing companies, shippers and customs agents. In this way, the time required to park the containers in the ports was restricted, all the unloading operations were optimized and all the containers already cleared and released directly to the port exit were addressed; while the consignments of goods are destined for control will be diverted to the control areas.
- **Customs clearance at destination (Fast corridors):** The fast corridors or controlled corridors help to relieve congestion in port areas and reduce the time for forwarding and customs clearance of goods from the point of disembarkation to the final destination, allowing geolocation systems to track merci, real-time monitoring of the company's logistics cycle. The goods are transferred through special corridors on rubber, railway or intermodal sections, "controlled" by electronic tracking systems (GPS, e-seals, etc.) which are placed side by side with the traditional systems for tracking documentary shipments. To date, the following have been activated:
 - 10 Fast Corridors activated on the road in collaboration with PLN (Uirnet) or 7 Fast Corridors activated on the railway
 - 2 intermodal Fast Corridors activated

The results obtained are that in 2016 and confirmed also for 2018, the Doing Business report of the World Bank has pushed Italy from 56th position to 1st in the world for trading across borders, a parameter that calculates the costs and timing in the import export procedures.

6.2 Future projects and initiatives

Starting from the previous paragraphs, a mapping of the main national initiatives on logistic digitalisation is carried out. This mapping will then be evaluated (see Chapter 7) through a deeper analysis of some of the main stakeholders in order to identify the impacts on the national freight transport system.

Initiatives will be evaluated for the digitalisation of the entire logistics chain, optimization of operations, monitoring and integrated management between various elements of the network:

1. Fast corridors, recently implemented between ports and land terminals in cooperation with the Italian Customs Agency;
2. The National Logistics Platform (PLN) being implemented by Uirnet;
3. Custom Agency initiatives;
4. Port Community System at national level (MUPCS).

7. Market study – Map and survey on main involved stakeholders (D.3.2.11)

To analyse the issues related to the ICT theme with the main operators in the logistics chain and then to verify the priority areas of intervention, three main stakeholders have been analysed:

- the Italian railway Infrastructure Manager (RFI);
- UIRNET
- Italian Customs Agency

They will be interviewed during the following months in order to directly understand their vision about ICT and intermodality and their future projects.

At the moment three topics for each stakeholder have been selected in order to better understand the vision and the forecasted ICT development. These topics are:

1. The Vision of the stakeholder on ICT and the foreseen development in the near future
2. Main future project
3. Interoperability and interfaces

7.1 RFI

RFI - Rete Ferroviaria Italiana is the company of the Ferrovie dello Stato Italiane Group with the public role of Infrastructure Manager, responsible for management and for safety of the rail traffic on the national network, track, stations and facilities.

In its role of Infrastructure Manager, RFI allows the access to the railway network to Railway Undertakings (RU), performs the maintenance and ensures the safe circulation on the whole network, manages the

investments for the upgrading of railway lines (High Speed and Conventional) and the technological development.

Topic 1 – Vision

RFI has made technological innovation one of its absolute priorities, also thanks to it not only to accompany the infrastructural evolution, but to anticipate it and make the Italian railway among the safest and most efficient in Europe in terms of safety, speed, capacity, punctuality, quality of services for passengers and freight.

Railway technologies include the set of systems, electronic and automated, which, behind the presence of operators both on the ground and on board trains, contribute to ensuring safe circulation over the entire network, but also the support and efficiency of all other processes connected to railway operation, from the line maintenance, to information to the public, to the electrification of the network, to the remote monitoring of owned assets.

Topic 2 – Projects

For the aim of PROMARES project two ongoing projects/systems from RFI are considered:

- ERTMS (European Rail Train Management System)- The Italian railways have implemented the Level 2 European Rail Traffic Management System / European Train Control System (ERTMS / ETCS) on the new lines of the High Speed / High Capacity network. The system - based on a European standard - ensures that the trains of the various countries can circulate seamlessly on all European lines that are equipped with it and is able to guarantee the safe movement of trains with the adoption of cutting-edge features and technologies.

At 31 December 2018, 709 km of high-speed lines were equipped with ERTMS without overlapping with national signalling systems and in the absence of lateral light signals. In fact, with ERTMS/ETCS, the constraints for international circulation deriving from the diversity of signalling systems currently in use in different countries are substantially removed. The adoption of the ERTMS system on conventional lines belonging to the European rail corridors that cross Italy and on the nodes of the main cities is now under development.

This could increase the overall efficiency of rail transport because locomotors changes (for signalling system, not for power system) will not be necessary in the future

- Integrated Traffic Platform (Piattaforma Integrata Circolazione – PIC) - PIC is the unitary information base, certified in quality and IT security, reference for all activities related to rail traffic. It has been created to ensure maximum integration between information management systems, monitoring and control of the various components of the circulation process and information systems supporting other production processes. Of particular importance for freight is its components PIC-IF and PIC-INFO, which are able to give services for railway companies and operators that use the RFI network, for requesting path and shunting operations, supplying traffic information, acquiring train composition data, etc. (PIC-IF) and those consultation of programmed and historical information as well as real-time monitoring of circulation (PIC-INFO);

Topic 3 – Interoperability

ERTMS / ETCS (European Rail Traffic Management System) is a management, control and protection system for railway traffic and related on-board signalling, designed to replace multiple and incompatible among

them, circulation and safety systems of the various European Railways in order to guarantee the interoperability of trains especially on the new high-speed rail networks.

To improve the planning and management of the railway operations of all the actors involved in the supply chain, aimed at increasing the competitiveness of rail and intermodal transport PIC could be linked to PCSs in a interoperable way. For example the Port System Authority of the Western Ligurian Sea and RFI (Italian Railway Network) have finalized the final elements for the interoperability agreement between the PCS (Port Community System) and the PIC (Integrated Circulation Platform), which let, through a structured and organized telematic dialogue, the exchange of a series of information and documents among operators.

7.2 UIRNET

UIRNet is a company governed by public law which, as a result of specific regulatory provisions and conventional agreements³ with the Ministry of Infrastructure and Transport (MIT), operates as the sole implementing body of MIT for the creation and management of the National Logistics Platform (PLN), as defined by the Ministerial Decree 20 June 2005 n.18T.

Topic 1 – Vision

After the creation of the Platform (NLP) and implemented its core services, UIRNet is committed to the project of guaranteeing its extension through the inclusion of new modules and maximizing its interoperability with other platforms that manage sectoral transport and logistics systems. In pursuing its goals, UIRNet strives to:

- to encourage intermodality, through specific projects for each logistic sector (road transport, railway infrastructure, ports, freight terminals and logistic platforms);
- propose tools for information exchange and cooperation, which guarantee the continuous flow of freight and the improvement of the efficiency and security of supply chains, optimizing the operations of private and public logistics operators and creating value for all the actors involved;
- to foster a uniform approach in the field of logistics computerization.

Topic 2 – Projects

As reported in Par. 6.1.1. UIRNet has completed the implementation of the core services of the PLN and their objective now is to create, within the context of the connection of the Ports to the PLN, a single ITS infrastructure interface at the service of the Port System Authorities/Port Authorities and the Port Communities of reference that dialogues with the PLN and is able to support the AdSPs/AP themselves in the specific competence activities for everything concerning the complex cycle of transport and logistics.

The development of the preliminary design activities of the PCS Single Model (MUPCS) appears to be of considerable interest at Country level if well developed, aimed at guaranteeing homogeneous development of infotelematics for the maritime / port and intermodal sector. At the moment not all the Port Authorities has agreed about the implementation of the MUPCS, so lot of work still needs from every stakeholder.

³ MIT has signed 3 Agreements with UIRNet (PLN, PLR and Security) for a total funding of about € 50M

Topic 3 – Interoperability

The MUPCS, if it will be completely and efficiently developed, could provide a complete tool both for all ports that have not yet started the realization of their own PCS, and to support existing PCS, with new operational verticals and new Institutional functions and services in the perspective of standardization, unification of processes and procedures, also in terms of interoperability.

7.3 Custom Agency

The Customs and Monopolies Agency - established by Legislative Decree No. 300 of 30 July 1999 - is one of the three tax agencies that carry out technical and operational activities formerly pertaining to the Ministry of Finance. It is a public entity with legal status and wide regulatory, administrative, patrimonial, organizational, accounting and financial autonomy. From 1 December 2012 - pursuant to Decree Law No. 95 of 6 July 2012 - (converted into Law No. 135 of 7 August 2012) - the Customs Agency has incorporated the Autonomous Administration of State Monopolies, changing its name to Customs and Monopolies Agency. In April 2018, the Ministry of Economy and Finance gave the green light to undertake a radical restructuring of the Agency's organization, functions and mission while providing that the functional division between the Customs and Monopolies Areas would be finally removed.

Topic 1 – Vision

The Agency's mission, apart from those typical of the Monopolies Agency, fosters Italy's economic growth by facilitating the movement of goods in international trade.

Topic 2 – Projects

For the aim of PROMARES project two ongoing projects/systems from Custom Agency are considered:

- AIDA, the informative system that allows Customs Offices to carry out the necessary activities for the management and control of electronically transmitted declarations by economic operators for the various tax sectors, the amounts of levies collected, and the handling of goods under suspension, both in intra-Community and national ambit.
- The fast corridors are one of the main project of the Custom Agency towards ICT for freight. They help to relieve congestion in port areas and reduce the time for forwarding and customs clearance of goods from the point of disembarkation to the final destination, allowing geolocation systems to track merci, real-time monitoring of the company's logistics cycle. The goods are transferred through special corridors on rubber, railway or intermodal sections, "controlled" by electronic tracking systems (GPS, e-seals, etc.) which are placed side by side with the traditional systems for tracking documentary shipments.

Topic 3 - Interoperability

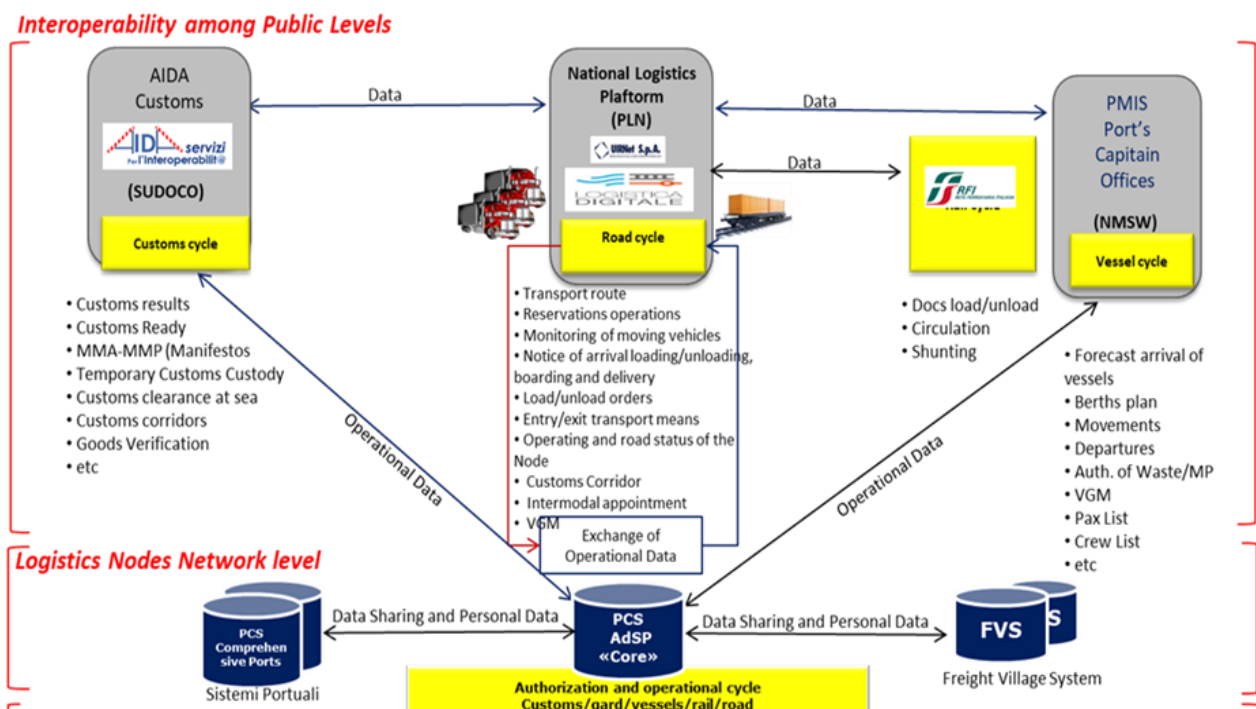
AIDA, active from 2003, is able integrate processes and unify controls between multiple administrations. Information taken from customs processes is made available to interested or competent bodies (national and EU bodies) via web. The computer system has gradually integrated various existing functional areas and subsystems to become the fulcrum around which the relationship with users and administrations is digitalized. The interoperability portal between administrations and between these and users (Aida Services

for Interoperability), makes the "integrated" processes operational with the administrations involved in the one-stop shop and offers new interactive services to users

7.4 Stakeholder's ICT platforms cooperation

The following scheme could show the interoperability among the three stakeholders analysed in Chapter 7, RFI, UIRNET and Customs Agency.

As reported in the scheme many stakeholders of the supply chain could benefit from ICT implementation and their integration.



8. SWOT Analysis

Following the general description of the national transport and logistics policies and strategies for intermodality provided in this document, with a specific focus on the logistics chain digitalization on-going and planned initiatives, the following chart depicts a SWOT analysis on the Italian intermodal freight system.

SWOT	
Strengths (S)	Weakness (W)
<ul style="list-style-type: none"> • Italy has a clear and recent planning framework targeting to intermodal and sustainable transport in line with EU objectives • Although freight traffic is still highly concentrated on road transport, combined road-sea traffic (Motorways of the Sea) and intermodal railway transport are growing in the last 5 years at good pace, probably also thanks to the implementation of national incentives • The development of digitalization procedures and process among the most important public authorities involved in the logistics chain are stated as a priority and some initiatives departed as pilots, have been now extended, also through the use of EU cofinancing programmes 	<ul style="list-style-type: none"> • Some national and centralized governance process focusing on transport, established by law, have still low operational base or have been disregarded (such as Conferenza nazionale delle Autorità di Sistema Portuale, Partenariato della Portualità e della Logistica, PGTL, new Law on RRT's, etc..) • The implemented incentive schemes for intermodal transport seem somehow, on certain specific origin-destination, in competition among them with limited effects on modal shift • The railway last mile connections to ports and RRT's have to be further boosted in terms of investments and infrastructural projects, as well as some regulatory simplification for intermodal transport have to be pursued
Opportunities (O)	Threats (T)
<ul style="list-style-type: none"> • The important investment planned on the upgrading of the railway network to EU standards and the infrastructural programmes foreseen in port's and RRT's seem to design an adequate transport network targeted to intermodal objectives • High interest among transport and logistics stakeholders to develop ICT and digitalization innovation as market tools • Availability of European funds (CEF 2014-2020, INTERREG, Horizon 2020 and new MFF 2021-2027) for infrastructural upgrading, digitalization and decarbonization in transport • National discussion on the extension and rationalisation of intermodal transport incentive schemes • Growing attention by final consumers to green, intermodal and sustainable transport solution as driver of their consuming choice 	<ul style="list-style-type: none"> • Horizontal and vertical transport market integrations trend, establishing worldwide leading companies in terms of market shares, could affect the achievement of national policies (such as intermodal transport) or undermine the regulatory national powers • Intermodal option has to be disseminated among market operators, while it is often seen as an expensive and non-reliable in terms of transit time solution • The several digitalization initiatives carried on need by each actor need to be interoperable with the other actors, in order to avoid a number of autonomous and single ICT micro-system self-referential

9. Final Remarks

The document has analysed in an extensive manner the Italian territorial needs for Promares project objectives, focusing on the description of the national strategies, policies, measures, planned investments, traffic data and ICT initiatives aiming at enhancing intermodality in freight transport.

More specifically, the most recent planning documents delivered at governmental level are highly focused in the promotion of intermodality as transport solution able to balance the freight modal split and to provide a more environmental friendly transport and logistics sector.

Consequently, the document has assessed both the national operational measures implemented for enhancing intermodal transport (Marebonus, Ferrobonus, Norma Merci) as well as the planned investments to 2030 horizon on the railway network and on the main national transport nodes (ports, RRT), depicting also the planned investments on roads and motorways on order to provide a comprehensive view of the national strategy in the sector.

Moreover, after having analysed the long term (2009-2018) and medium-short term (2014-2018) trends in Italian freight transport market, where intermodal options (such as railway and Motorways of the Sea) have registered important performances, the document have deepen the issue of digitalization development as enabler tool for enhancing intermodal transport: a list of relevant national stakeholder has been identified and a description of their on-going and planned initiatives in the field have been provided.

Finally, a SWOT analysis has highlighted the “atouts” and the opportunities for the further development of intermodal transport in Italy, illustrating however some criticalities that could affect the recent positive trends foreseen in Italy in the segment.