

The future of transport in the context of the Recovery Plan

Final study



Policy Department for Structural and Cohesion Policies
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RESEARCH FOR TRAN COMMITTEE

The future of transport in the context of the Recovery Plan

Final Report

Abstract

This Report provides the European Parliament's Committee on Transport and Tourism (TRAN) with an overview of the EU's 29 transport sector priorities and the National Recovery and Resilience Plan's (NRRP) funding to achieve those priorities. NRRP transport sector measures also contribute to the further development of nine TEN-T Core Network Corridors and the achievement of TEN-T goals.

This document was requested by the European Parliament's Committee on Transport and Tourism.

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LIST OF ABBREVIATIONS

AFITF	The French Agency for Transport Infrastructures Funding
ASP	Service and Payment Agency (<i>l'Agence de Services et de Paiement</i>)
BMVI	Federal Ministry for Transport and Infrastructures (<i>Das Bundesministerium für Digitales und Verkehr informiert über Themen zu Verkehr, Mobilität und Digitales</i>)
BRT	Bus rapid transit
CBG	Compressed Bio Gas
CCAM	Cooperative, connected and automated mobility
CCS	Carbon capture and storage
CdP	Program Agreements (<i>Contratti di Programma</i>)
CF	Cohesion Fund
C-ITS	Cooperative Intelligent Transport Systems
CNC	Core Network Corridors
CZ	Czech Republic
DG MOVE	Directorate-General for Mobility and Transport
EADR	European Alternative Dispute Resolution
EASA	European Union Aviation Safety Agency
EBA	The Federal Railway Authority (<i>Eisenbahn-Bundesamt</i>)
EC	European Commission
eFTI	Electronic Freight Transport Information
ERDF	European Regional Development Fund
ERTMS	European Railway Traffic Management System
ETCS	European Train Control System
EU	European Union
EV	Electric vehicle
HBOR	Croatian Bank for Reconstruction and Development (<i>Hrvatska banka za obnovu i razvitak</i>)
ICT	Information and communications technology
IPCEIs	Important Projects of Common European Interest
IPTO	Independent Power Transmission Operator
IPU	Inter-Parliamentary Union
IT	Information technology

ITS	Intelligent Transport Systems
IWT	Inland waterway transport
LVER	Low Voltage Electrotechnical Regulation
LVM	Ministry of Transport and Communications in Finland (<i>liikenne- ja viestintäministeriö</i>)
MaaS	Mobility as a Service
NGEU	Next Generation EU
NIP	National Innovation Programme
NRFP	National Recovery and Resilience Plan
NSCP	National Society of Compliance Professionals
OTW	Organisme de Transport de Wallonie
PPP	Public Private Partnership
R&D	Research and Development
R&I	Research and Innovation
RFI	Request for Information
RRF	Recovery and Resilience Facility
SGPI	General Secretariat for Investment (Secrétariat Général pour l'Investissement)
SLP	Fast-track Programme "Digital Rail Germany"
SME	Small and medium-sized enterprises
SR	Slovak Republic
SSMS	Sustainable and Smart Mobility Strategy
SSS	Shortsea Shipping
SUMP	Sustainable Urban Mobility Plans
TBC	Technical Building Code
TEN-T	Trans-European Transport Network

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EXECUTIVE SUMMARY

KEY FINDINGS

- The EU's priorities in the field of transport are identified on the basis of an analysis of EU policy documents, including the [Sustainable and Smart Mobility Strategy \(SSMS\)](#), [Directorate-General for Mobility and Transport \(DG MOVE\) Strategic Plan 2020-2024](#) and the [EU's webpage on Transport and Mobility](#), and complemented with other policy documents. In total, 29 EU transport priorities are identified within the three themes of smart, sustainable, and resilient transport.
- The Recovery and Resilience Facility (RRF) is the centrepiece of the EU's Recovery Plan, with an allocation of EUR 723.8 billion in non-repayable support and loans. 22 out of 27 National Recovery and Resilience Plans (NRRP) approved by the Council implementing decision were assessed in the study. The assessed NRRPs include a total RRF contribution of EUR 449.9 billion out of which EUR 291.1 billion in the form of non-repayable support and EUR 158.8 billion in the form of loans.
- The NRRPs examined contained a combined total of:
 - 218 measures related to the EU's priorities under the theme of "sustainable transport", with the highest number of NRRPs measures related to deployment of alternative fuels in road transport.
 - 68 measures related to the EU's priorities under the theme of "smart transport" and 44% of those measures related to IT systems development.
 - 98 measures related to the EU's priorities under the theme of "resilient transport" and 75% of those measures related to transport sector governance.
- NRRPs contribute to the achievement of TEN-T policy objectives and compliance of the nine Core Network Corridors (CNCs) with TEN-T requirements. Rail will be the main beneficiary of the NRRPs, with upgrades of the existing rail infrastructure in nine Member States, the construction of new compliant rail lines in four Member States, and the European Railway Traffic Management System (ERTMS) deployment in six Member States.
- In the revision of NRRPs, higher focus could be placed on cross-border projects, modal shift to rail and waterborne transport, more and better links between governance and other measures to ensure long-term and sustainable change, and more and better use of financial instruments by supporting bankable projects and projects developed by the private sector.

NRRPs' contribution to the achievement of EU's policy priorities

The main objective of the study is to **provide an overview of the Recovery and Resilience Fund's contribution to the achievement of EU's policy priorities** for the smart and green transition of the transport sector. The study is divided into three tasks, firstly **identifying EU's policy priorities** for sustainable, smart, and resilient transport. The next task involves an **assessment of NRRPs' impact** on achieving EU transport policy priorities. The third task includes the **assessment of NRRPs' contribution to Core Network Corridor completion**. Based on an analysis of EU policy documents,

29 EU priorities in the field of transport are identified, which can be divided into the themes of 'sustainable transport', 'smart transport' and 'resilient transport'.

All approved NRRPs, 22 in total, have been analysed in this study. **NRRPs' total contribution** amounts to approximately EUR 449.9 billion, of which EUR 291.2 billion, or 65%, is used as non-repayable support and EUR 158.8 billion, or 35%, in the form of loans.

The total number of measures planned for theme "**sustainable transport**" is 218, or 56% of all transport sector measures identified. 21 out of 22 Member States (89 measures in total) focus on the deployment of alternative fuels in road transport. However, more projects and investments should have been planned for waterborne and rail transport, to have a balanced approach to transport sector development. In addition, considering the need to reduce the impact that the transport sector has on the environment, more could have been done to increase public transport use and to make it more sustainable.

The theme "**smart transport**" is characterised by a high number of IT projects including software and IT infrastructure development. Smart mobility measures are mainly planned for road and rail transport and there is insufficient contribution to cross-border travel under the theme. However, only four Member States are planning projects to support data availability, access and exchange of mobility data. Thus, more projects focusing on promoting data exchange between Member States should be launched, as well as more projects under the theme of 'smart transport' generally, given its priority within the EU.

The theme "**resilient transport**" is addressed by 21 out of 22 Member States and the majority of measures (75%) are governance-related. Of all the measures, 71% relate to improved transport sector governance and are included in 19 NRRPs. The governance measures include transport master plans development, enhancing the regulatory framework, and transport sector related reforms. There are a number of transport sector priorities which are not covered by NRRPs or are covered only by a small number of projects.

NRRPs' contribution to the achievement of TEN-T policy objectives and compliance of the **Core Network Corridors (CNCs)** with TEN-T requirements varies between Member States and transport mode. Member States with more mature transport sector infrastructure networks tend to focus on other priorities and are not using the Recovery and Resilience Facility (RRF) to further develop CNCs infrastructure. **Rail will be the main beneficiary** of the NRRPs, with upgrades of the existing rail infrastructure to increase compliance with TEN-T requirements in nine Member States, the construction of new compliant rail lines in four Member States, and the European Railway Traffic Management System (ERTMS) deployment in six Member States.

Recommendations for policy making

Considering the EU transport sector objectives, there are several areas which are not sufficiently addressed in the Member States' NRRPs and where further focus and investments are needed:

- The development of the transport network from the European perspective, or **cross-border projects**.
- There is a need to better facilitate the **modal shift to rail and waterborne transport** by increasing investments and, where feasible, include a cross-border component.
- **Multi-modal passenger transport** could be increased by contributing to the shift from private cars to public transport.

- **Safety and security measures** are not sufficiently addressed in the NRRPs; therefore, it is recommended to increase the number of measures in this area, especially for those Member States where road fatalities are high.
- **Social aspects**, such as fair, accessible and just mobility and transport sector worker conditions are not sufficiently covered; therefore, it is recommended to include social aspects as a cross-cutting priority for the different transport sector measures.
- More measures to “**internalise external transport costs**” would help reduce the carbon footprint.

The European database could be further developed to include information in terms of location and nature of the projects and be used to **monitor the implementation of the NRRPs** on the ground. The database could be used to monitor the project contribution on the achievement of **EU’s policy objectives (different fields, including transport)**.

In addition, there are five additional areas which were not prioritised by Member States and need to receive more focus within EU policies, including:

- Improving **energy efficiency** within transport, including improved energy efficiency of road transport.
- **Further developing the public transport system**, including cross-border public transport networks, and linking this with the use of alternative fuels.
- Better **facilitating the modal shift** to rail and waterborne transport.
- Combining implementation measures with support for the **behavioural change of citizens** to more efficiently achieve transport policy objectives, for example by incentivizing the use of alternative fuels by private cars and public transport modes.

1. INTRODUCTION

KEY FINDINGS

- The main objective of the study is to provide an overview of the Recovery and Resilience Fund's contribution to the achievement of EU's policy priorities for the smart and green transition of the transport sector.
- The EU's Recovery and Resilience Plan, called the Next Generation EU (NGEU), consists of the [Recovery and Resilience Facility](#), with a total allocated amount of EUR 723.8¹ billion, of which EUR 385.8 billion is non-repayable support and EUR 338 billion is loans and several other smaller programmes.
- The study is divided into three tasks: identifying EU's policy priorities for sustainable, smart, and resilient transport; assessing the NRRPs' impact on achieving EU transport policy priorities; and assessing the NRRPs' contribution to CNC completion.
- Based on an analysis of EU policy documents, 29 EU priorities in the field of transport are identified, which can be divided into the themes of 'sustainable transport', 'smart transport' and 'resilient transport'.
- There are twelve policy priorities aimed at making the transport system more sustainable. These are centred around three pillars: making all transport modes more sustainable; making sustainable alternatives widely available in a multimodal transport system; and introducing the right incentives to stimulate the transition to sustainable transport.
- Nine policy priorities relate to smart transport, ranging from supporting the implementation of smart transport in all modes of transport to supporting transport innovation, the supply of digital infrastructure for smart transport and promoting the availability, access and exchange of transport data.
- Eight policy priorities relate to resilient transport. This theme needs to be interpreted broadly and includes topics such as the governance of transport investments, fair and just transport, infrastructure development and network resilience against disruptions.

The introductory chapter provides information on the study objective and introduces the structure of the National Recovery and Resilience Plans and their approval status. The study is divided into three tasks and a summary of methodologies for each task is presented below. The chapter provides a summary of the 29 identified EU policy priorities for sustainable, smart, and resilient transport. More information about identified priorities is provided in Overview Briefing on ["The future of transport in the context of the Recovery Plan"](#), which forms part of this overall research project.

1.1. The objective of the study

The main objective of the study is to provide an overview of the Recovery and Resilience Fund's (RRF) contribution to the achievement of EU's policy priorities for the smart and green transition of the transport sector. For the purpose of this analysis, the EU's transport sector priorities were grouped into 29 themes, under the headings of sustainable, smart, and resilient transport, and the approved National Recovery and Resilience Plans (NRRP) mapped against these 29 themes.

One of the EU's transport sector goals is to develop the Trans-European Transport Network (TEN-T); therefore the study also includes an assessment of the foreseeable impact of the approved NRRPs' contribution to TEN-T development, including closing infrastructure gaps and removing bottlenecks and technical barriers in the transport sector, thus helping to strengthen social, economic, and territorial cohesion in the EU.

Based on the assessment results, the study then evaluates whether any changes should be made at the EU level to better promote the smart and green transition of the transport sector. The study report also includes a set of policy recommendations for EU policymakers, primarily for Members of the European Parliament, on what could be done at the EU level to strengthen the effectiveness of the RRF's contribution to the smart and green transition of the transport sector in the EU regions and Member States.

1.2. Overview of the National Recovery and Resilience Plans

The EU's Recovery and Resilience Plan, called Next Generation EU (NGEU), consists of the [Recovery and Resilience Facility \(RRF\)](#), with an allocated total amount of EUR 723.8¹ billion, of which EUR 385.8 billion is non-repayable support and EUR 338 billion is loans and several other smaller programmes. The funding has been allocated based on [the EU's 2021-2027 long-term budget and Next Generation EU](#).

The RRF is implemented based on the Member States' Recovery and Resilience Plans (RRPs), which were prepared in accordance with the Commission's working document '[Guidance to Member States recovery and resilience plans \(Guidance\)](#)'. In the NRRPs, individual reforms and investments are structured through coherent components. Based on the Commission's Guidance, a component is a constituent element of the NRRP, with each component reflecting related reform and investment priorities in a specific policy area or sector. For example, "Eco-friendly mobility" is a coherent component within Austria's NRRP.

Each component consists of mutually reinforcing and complementary measures (reforms or investments). These measures tackle one or more challenges identified by the Member State and are highlighted in Country Specific Recommendations, published by the European Commission. These measures are implemented through a comprehensive and coherent package. For each measure there is a target – a quantitative achievement (based on an agreed upon indicator) and qualitative achievement (based on a milestone). For example, within Cyprus, a quantitative indicator is the "installation of at least 330 charging points".

At the time of the preparation of this study, the Commission had received 26 NRRPs², out of which 22 were approved by the Council Implementing Decision. These NRRPs are assessed in this study. The NRRPs of Sweden, Hungary, Poland and Bulgaria are currently being evaluated and were not assessed in the study report.

1.3. Study methodology

As mentioned above, the study is divided into three tasks: identifying EU's policy priorities for sustainable, smart, and resilient transport; assessing the NRRPs' impact on achieving these policy priorities and assessing the NRRPs' contribution to CNC completion. These tasks are carried out by using the methodologies described below.

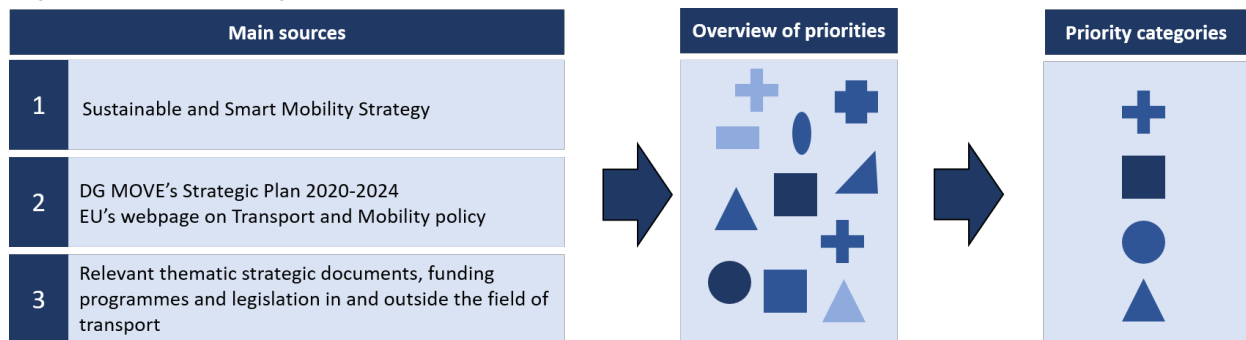
¹ This and the following figures are in current prices (2021), derived from the EU's 2021-2027 long-term Budget and Next Generation EU: Facts and Figures, <https://op.europa.eu/en/publication-detail/-/publication/d3e77637-a963-11eb-9585-01aa75ed71a1/language-en>

² The Netherlands had not yet submitted its NRRP.

1.3.1. Methodology to identify transport sector priorities

The identification of the EU's transport sector priorities is based on a broad analysis of the EU's main political and strategic documents over the last years and on the EU legislation in force. The methodological approach is presented in [Overview Briefing on "The future transport in the context of the Recovery Plan"](#). The basic source for this analysis is the Sustainable and Smart Mobility Strategy (SSMS). This document was published in December 2020 and serves as the current foundation of EU's transport policy. The [DG MOVE Strategic Plan 2020-2024](#) and the [EU's webpage on Transport and Mobility](#) are also used to get an overview of the EU policy priorities in the field of transport.

Figure 1. Methodological approach



Data source: Own elaboration

Other policy documents (i.e. action plans, communications, regulations, directives and decisions) that focus more specifically on certain themes within the transport sector were also used within the study. Examples are the [EU Aviation Strategy](#), [EU's Road Safety Strategy](#), the [TEN-T Regulation](#) and funding programmes such as the [Connecting Europe Facility](#) (CEF), the [Cohesion Fund](#) (CF) and the [European Regional Development Fund](#) (ERDF). Relevant documents outside the transport sector are also included and checked for priorities which are relevant for transport, such as the [European Data Strategy](#).

The [Overview Briefing on "The future transport in the context of the Recovery Plan"](#) published by the European Parliament, which is part of this overall study, includes a detailed description of the methodology for the identification of transport sector priorities and results.

1.3.2. Methodology to assess NRRPs' impact on achieving EU transport policy priorities

The future of the transport sector in the context of the NRRPs is assessed based on the Council Implementing Decision on the approval of the RRP for each Member State. The analysis includes an assessment of all approved NRRPs (22 in total, including the components, measures, milestones and targets) against EU's 29 transport sector priorities identified in the overview briefing.

The Council Implementing Decision includes information on the Union's financial contribution in the form of non-repayable support. The Annex to the Council Implementing Decision includes a description of the components, measures, and milestones and targets for monitoring the implementation of the measures. The Annex to the Council Implementing Decision also includes the estimated total cost of the RRF, including non-repayable and loan component, but does not include financial information per component and measure.

There are different types of measures used to address the transport sector priorities, therefore the planned measures are grouped as investments in infrastructure, governance, IT systems and research. This grouping will allow for a better overview of the types of measures that have been planned and financed.

The assessment starts with selecting all the transport sector measures included in each NRRP (per Member State) and thereafter segmenting them to fall under one of the 29 EU transport sector priorities identified. In a case where a measure relates to more than one transport sector priority, it is included under each of those priorities; for instance, alternative fuel infrastructure and governance related to alternative fuel use. This segmentation is included in Annex 2. An example of a component, priority, measure, milestone and target is provided in table 1 below.

Table 1. Example for the assessment of NRRPs measures to transport sector priorities

Component	Priority	Measure, Milestones and Target
Cycling and walking infrastructure	G. Investment I-3A: Cycling infrastructure	Measure – start of all cycling and walking projects; New and refurbished cycling roads Milestone – adoption of the decision or contract award Target (km) 204.3 and 1389.6 km of new and refurbished cycling paths

Data source: Own elaboration, Council decision

After the assessment of the NRRPs against the different EU transport sector priorities, the next step includes consolidating all the identified NRRP transport sector measures per EU transport sector priority. The consolidated assessment is included in Annex 3 and example provided below.

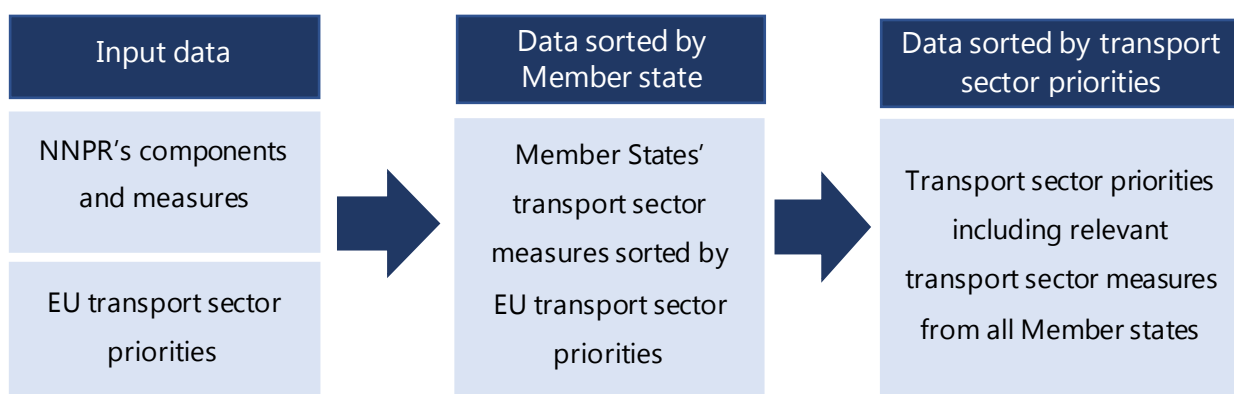
Table 2. Example for the consolidated assessment

Cyprus	Infrastructure - 2	Investment 2 (C2.2I2): Creation of electro-mobility infrastructure. Measure - Installation of at least 1,200 charging points, due to the support granted Target (numbers) 0 to 1,200 charging points Investment 3 (C2.2I3): Promote widespread use of Electric Vehicles (EVs). Measure - Purchase of electric vehicles, electric bicycles (at least 2,050), due to the support granted; Purchase of electric vehicles, electric bicycles (at least 5,750), due to the support granted; Scrapping of high emission vehicles, due to the support granted Target (number) 0 to 5,750 electric vehicles, 3,50 vehicles
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Data source: Own elaboration, Council decision

The overview of the assessment methodology is presented below in figure 2.

Figure 2. Methodological approach



Data source: Own elaboration

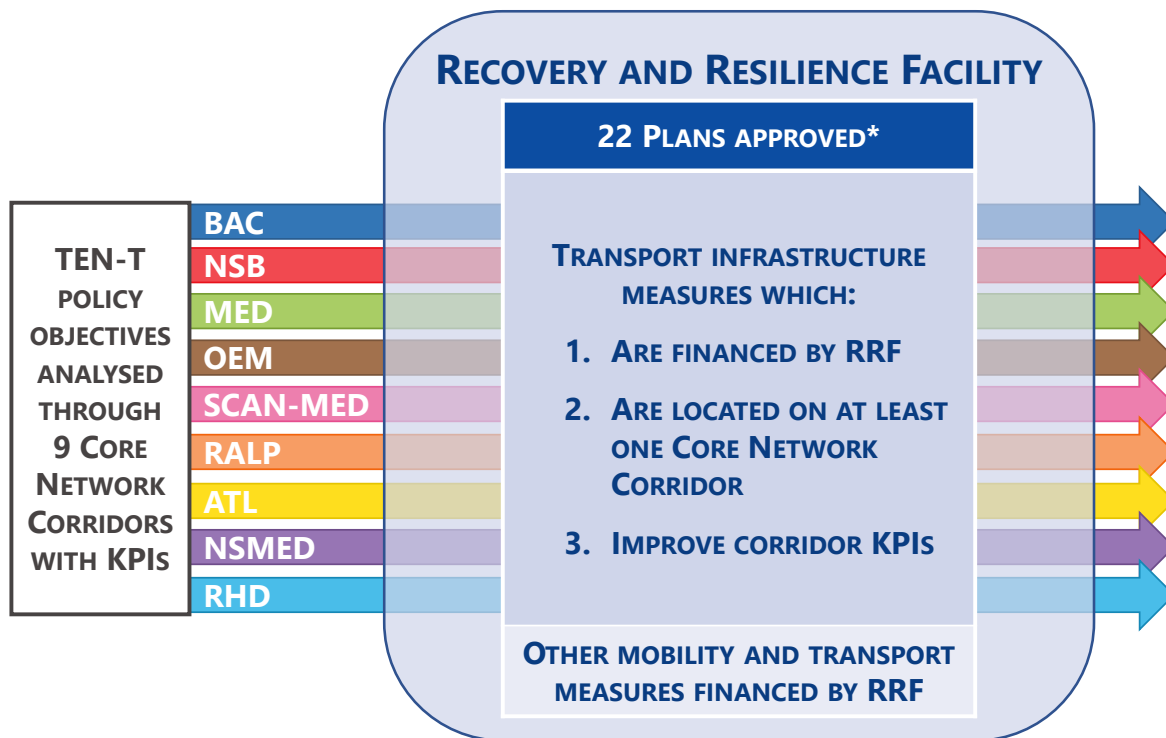
1.3.3. Methodology to assess the NRRPs' contribution to CNC completion

One of the main objectives of EU's transport policy is to ensure that the CNCs of the TEN-T meet the technical requirements set out in [Regulation \(EU\) 1315/2013](#). The evolution and development of the CNC is monitored by the CNC Work Plan prepared for each CNC by the CNC European Coordinator. Four [CNC Work Plans](#)⁴ for each CNC have been prepared and published by the European Commission over the years. Work Plans include key performance indicators (KPIs) enabling the measurement and tracking of TEN-T compliance for each CNC. KPIs correspond to technical requirements set in the TEN-T Regulation for all transport modes. For example, under rail it includes electrification, UIC track gauge, line speed for freight trains, axle load permitted for freight trains, freight train length allowed and ERTMS signalling. Compliance for road entails road class (express road or motorway), parking areas along motorways, and availability of alternative clean fuels. Specific KPIs are also set for inland waterways, ports, airports, and rail-road terminals.

The basis for CNC compliance with TEN-T requirements comes from the latest CNC 4th Work Plan published in June 2020 for each CNC. This Work Plan presents KPIs and current implementation status of the CNC compliance with TEN-T requirements in 2020. Beyond compliance with TEN-T requirements, the projects referred to in the 4th Work Plan also contribute to the removal of bottlenecks and technical barriers per CNC.

An overview of the methodology used is provided in figure 3 below. Measures included in the NRRPs are cross-referenced with TEN-T requirements and CNC compliance status included in the CNC 4th Work Plan.

Figure 3. Methodological approach



** 5 National Recovery and Resilience Plans have not been approved yet*

Data source: Own elaboration

⁴ All CNC Work Plans are available on the European Commission's website at the following link, and links to each individual CNC Work Plan are given in the references: https://transport.ec.europa.eu/transport-themes/infrastructure-and-investment_en

The assessment of the NRRPs' contribution to the achievement of TEN-T requirements include only infrastructure measures. Measures which indirectly contribute to TEN-T policy implementation, such as research measures, are not included as it is difficult to assess their impact on CNC compliance with TEN-T requirements.

The assessment relates only to CNC and does not include the TEN-T Comprehensive Network, however some of the NRRP measures do contribute to the development of TEN-T Comprehensive Network. Due to the overlapping of CNC sections, some measures from the NRRPs can be presented several times in the assessment, as they contribute to compliance on several CNCs. Some measures cover different sectors and territories which, without additional information, cannot be linked to CNC. Therefore, there could be additional measures which fully or partly contribute to the achievement of compliance with TEN-T requirements which were not included in the analysis.

1.4. Grouping of EU transport sector priorities

Transport policy is one of the key policy areas of the EU. It enables the free flow of persons, goods, and services, and is key in accomplishing the European Single Market. The transport sector contributes significantly to the EU's economy, [employing more than 10 million workers and comprising around 1.1 million enterprises](#). EU transport policy is regulated by more than [150 legal acts](#) and the policy and actions initiated by the EU have large impacts on the functioning of the European transport sector.

The EU's main transport policy objectives are threefold: (i) promote sustainable forms of transport, (ii) improve the digitalisation of transport, and (iii) make the transport system more resilient. These policy priorities are described in the [Sustainable and Smart Mobility Strategy \(SSMS\)](#); in the [DG MOVE Strategic Plan 2020-2024](#); the [Intelligent Transport Systems \(ITS\) Directive 2010/40/EU](#) and the [TEN-T Regulation \(EU\) 1315/2013](#).

Based on analysis of EU policy documents, 29 EU priorities in the field of transport are identified. These priorities are divided into the three themes of sustainable, smart, and resilient transport and presented in table 3 below.

Table 3. 29 EU priorities in the field of transport

Theme	#	Priorities
Sustainable transport	C1	Improve energy efficiency of road transport
	C2	Deployment of alternative fuels in road transport
	C3	Improving sustainability of waterborne transport and ports
	C4	Improving sustainability of airborne transport and airports
	C5	Improving sustainability of rail transport and rail terminals
	C6	Improve multimodal transshipment locations to facilitate a modal shift
	C7	Improve rail transport to facilitate a modal shift
	C8	Improve water transport to facilitate a modal shift
	C9	Improve active mobility (cycling, walking) to facilitate a modal shift
	C10	Cross-border transport and interoperability
	C11	Sustainable urban transport
	C12	Internalising external costs of transport
Smart transport	C13	Smart mobility in road transport
	C14	Smart mobility for multimodal passenger transport
	C15	Smart mobility for multimodal freight transport
	C16	Smart mobility in rail transport
	C17	Smart mobility in aviation
	C18	Smart mobility in waterborne transport
	C19	Innovation in smart mobility technology

Theme	#	Priorities
Resilient transport	C20	Develop digital infrastructure for enabling smart mobility
	C21	Support data availability, access and exchange of mobility data
	C22	Improved transport sector governance
	C23	Completion of the TEN-T
	C24	Improving the resilience of the transport system against disruptions
	C25	Fair, accessible and just mobility and passenger rights
	C26	Improve conditions and attractiveness of working in transport sector
	C27	Gender equality
	C28	Road safety and security
	C29	Improve safety and security of other modes of transport

Data source: Own elaboration

2. RRF CONTRIBUTION TO TRANSPORT SECTOR

KEY FINDINGS

- NRRPs' total contribution amounts to approximately EUR 449.9 billion, of which EUR 291.2 billion, or 65%, is used as non-repayable support and EUR 158.8 billion, or 35%, is in the form of loans. All Member States have transport sector measures under different components and most of them have a dedicated transport sector component. In total, 384 transport sector measures are identified.
- For the theme "sustainable transport", Member States focus on the deployment of alternative fuels. However, more projects and higher investments could have been planned for waterborne, rail and public transport. Moreover, an important measure not addressed by Member States is cross-border transport and interoperability.
- The theme "smart transport" is characterised by a high number of IT projects and smart mobility measures which are mainly planned for road and rail transport. There is insufficient contribution to cross-border travel and only four Member States are planning projects to support data availability, access, and exchange of mobility data.
- The theme "resilient transport" is characterised by a high number of transport sector governance measures, including developing transport master plans, enhancing the regulatory framework and transport sector related reforms. Safety and security issues are not sufficiently addressed in NRRPs.

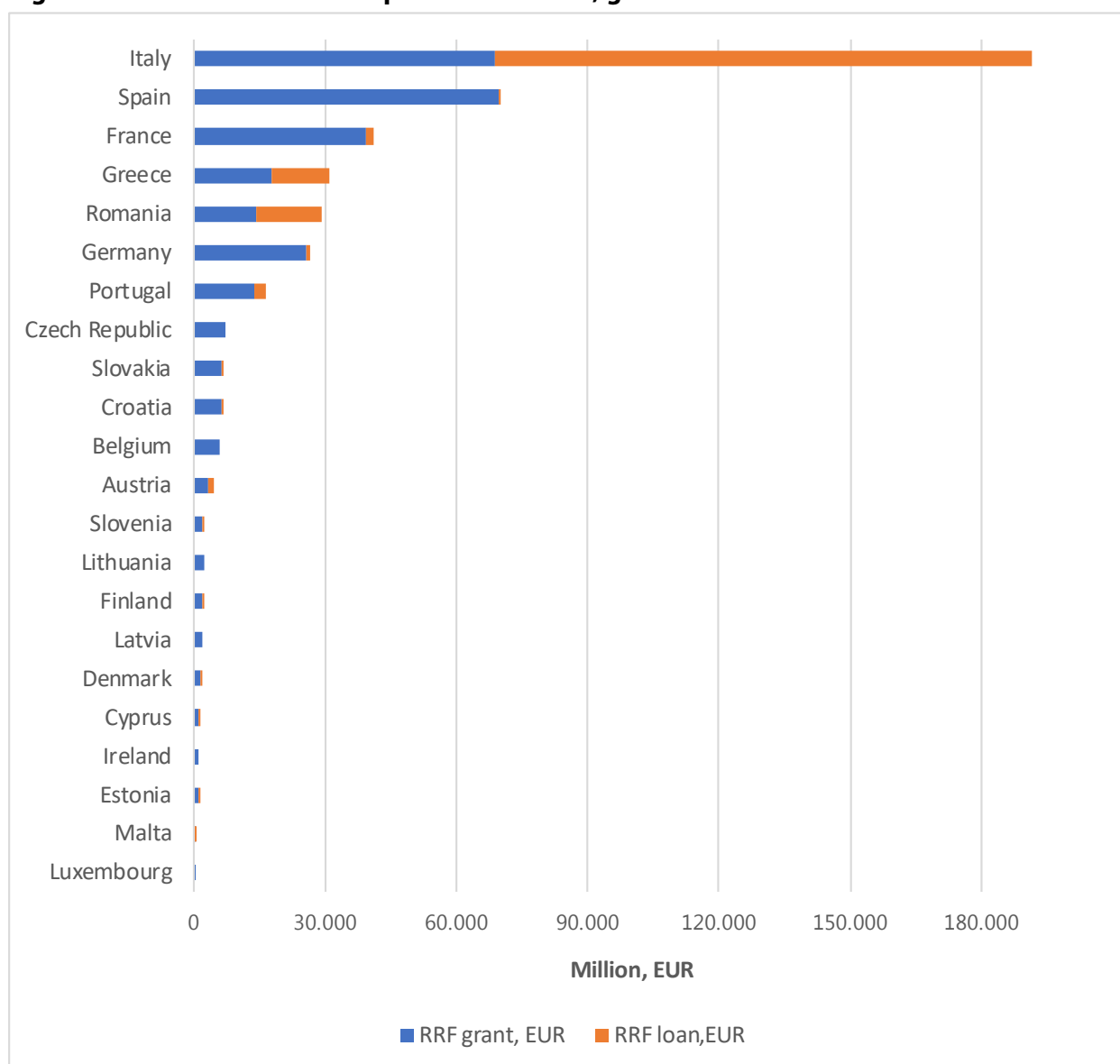
The chapter provides an assessment of NRRPs' contribution to identified 29 EU transport sector policy priorities. For each policy priority, the statistical information on measures is provided grouped by Member States and types of measures. Thereafter, a summary of measures per Member State is provided. The chapter ends with a summary of the analysis for the three main themes - sustainable, smart, and resilient transport.

2.1. Overview of the RRF financing and transport sector components

RRF financing

The approved RRF financing (non-repayable support or grant) per Member State is included in the Council Implementing Decision on the approval of the assessment of the Recovery and Resilience Plan (Article 2 – financial contribution). The annex to the Council Implementing Decision on the approval of the assessment of the Recovery and Resilience Plan (section 2 - financial support) includes the estimated total cost of RRF per Member State. The estimated total cost includes non-repayable support and loans.

Most of the Member States are using only non-repayable support. However, there are several Member States who allocated significant financing for NRRP implementation by using loans, such as Italy, Greece and Romania. The use of loans in the NRRP implementation allows for the possibility to allocate higher amounts for achieving the set targets, to use funds more effectively and to implement the projects with financial return. Figure 4 below includes information about total RRF funding per Member State, including the split between non-repayable support and loan. Loans are used to finance different investment measures and not all of them are related to the transport sector.

Figure 4. RRF total contribution per Member State, grants and loans

Data source: Own elaboration based on Council implementing decision on the approval of the assessment of the recovery and resilience plan

Table 4 below contains information on the total RRF contribution by Member State, including non-repayable support and loans.

Table 4. RRF contribution per Member State, grant and loan

Member State	RRF total contribution - grant and loan, EUR	RRF grant, EUR	RRF loan, EUR	Loan / RRF total contribution, %
Austria	4 449 475 001	3 461 398 824	988 076 177	22
Belgium	5 924 952 328	5 923 953 327	999 001	0
Croatia	6 393 794 220	6 295 431 146	98 363 074	2
Cyprus	1 206 400 000	1 005 946 047	200 453 953	17
Czech Republic	7 035 697 549	7 035 697 549	-	0
Denmark	1 615 267 709	1 551 401 105	63 866 604	4
Estonia	982 490 000	969 299 213	13 190 787	1
Finland	2 094 687 000	2 085 341 084	9 345 916	0

Member State	RRF total contribution - grant and loan, EUR	RRF grant, EUR	RRF loan, EUR	Loan / RRF total contribution, %
France	40 950 000 000	39 368 318 474	1 581 681 526	4
Germany	26 518 833 613	25 613 478 442	905 355 171	3
Greece	31 164 331 515	17 769 942 602	13 394 388 913	43
Ireland	989 938 300	988 966 534	971 766	0
Italy	191 499 177 889	68 880 513 747	122 618 664 142	64
Latvia	1 826 000 000	1 826 000 000	-	0
Lithuania	2 224 686 966	2 224 686 966	-	0
Luxembourg	93 354 077	93 354 077	-	0
Malta	344 900 000	316 403 496	28 496 504	8
Portugal	16 643 679 377	13 907 294 284	2 736 385 093	16
Romania	29 181 842 750	14 239 689 750	14 942 153 000	51
Slovakia	6 750 000 000	6 328 586 359	421 413 641	6
Slovenia	2 482 687 549	1 776 927 281	705 760 268	28
Spain	69 528 050 000	69 512 589 611	15 460 389	0
TOTAL	449 900 245 843	291 175 219 918	158 725 025 925	-

Data source: Own elaboration based on Council implementing decision on the approval of the assessment of the recovery and resilience plan

Dedicated transport sector components

All NRRPs assessed in the study were approved in 2021 (July – October), as presented in table 5 below. All Member States have transport sector measures under different components and most of the Member States also have a dedicated transport sector component in their approved NRRPs, mostly related to “sustainable transport”. There are three Member States with several dedicated transport sector components: Belgium, the Czech Republic and Spain. There are also four Member States (Greece, Ireland, Latvia and Lithuania) which do not have a dedicated transport sector component. Instead, transport sector related measures are included under economic, environment and other components. Information about the transport sector dedicated components is included in table 5 below. Non-transport sector specific components are highlighted in italic.

Table 5. Information on specific components of the transport sector for each country.

Member State	Annex to the Council implementing decision date	Dedicated transport sector components
Austria	6 July 2021	Eco-friendly mobility
Belgium	6 July 2021	Greening road transport Cycling and walking infrastructure
Croatia	20 July 2021	Development of a competitive, energy sustainable and efficient transport system
Cyprus	20 July 2021	Sustainable transport
Czech Republic	31 August 2021	Sustainable transport Clean mobility
Denmark	6 July 2021	Sustainable road transport
Estonia	5 October 2021	Sustainable transport
Finland	4 October 2021	Low-carbon solutions for communities and transport
France	5 July 2021	Infrastructure and green mobility
Germany	5 July 2021	Climate - friendly mobility
Greece	6 July 2021	<i>Modernise and improve resilience of key economic sectors</i>
Ireland	31 August 2021	<i>Advancing the green transition</i>

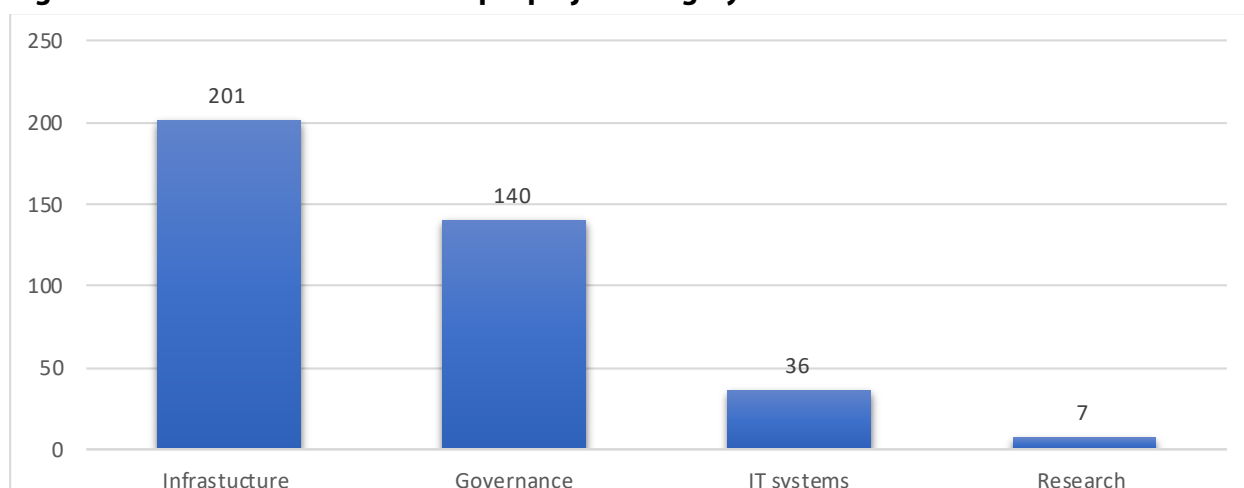
Member State	Annex to the Council implementing decision date	Dedicated transport sector components
Italy	7 July 2021	Energy transition and sustainable mobility
Latvia	5 July 2021	<i>Climate change and environmental sustainability</i>
Lithuania	20 July 2021	<i>Green transformation of Lithuania</i>
Luxembourg	5 July 2021	Decarbonisation of transport
Malta	28 September 2021	Decarbonising transport
Portugal	5 July 2021	Sustainable Mobility <i>Infrastructure</i>
Romania	27 September 2021	Sustainable transport
Slovakia	6 July 2021	Sustainable transport
Slovenia	20 July 2021	Sustainable transport
Spain	5 July 2021	Sustainable, safe and connected mobility shock plan in urban and metropolitan environments Sustainable mobility (long-distance)

Data source: Own elaboration based on annex to the Council implementing decision on the approval of the assessment of the recovery and resilience plan

Grouping of transport sector measures

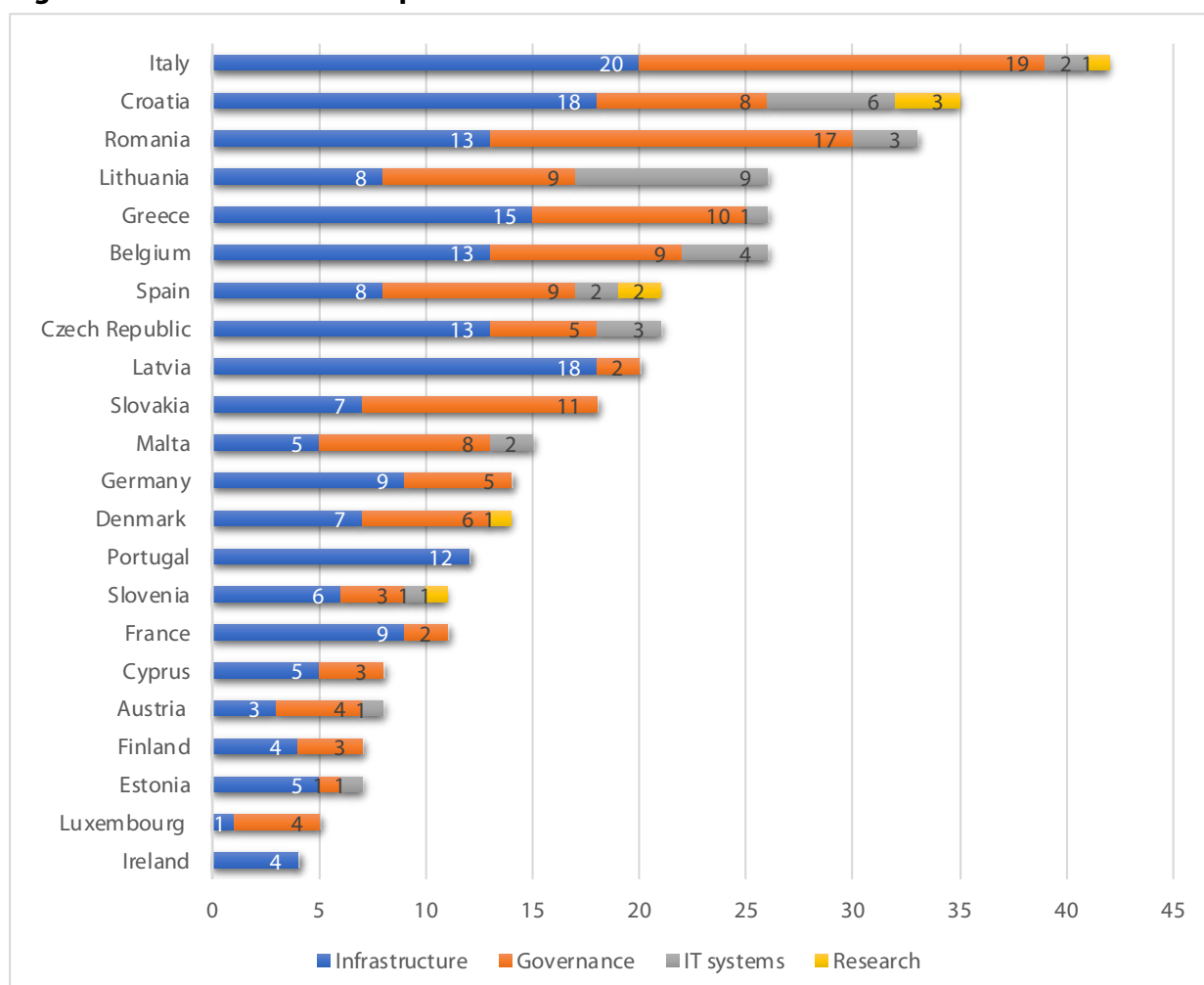
As per the study methodology described above, an assessment is performed for all approved NRRPs to identify transport sector measures. In total, 384 transport sector measures were identified. Considering the high number of measures and variety of planned transport sector projects, transport sector measures are grouped into four project categories: infrastructure, governance, IT systems and research. Figure 5 below presents the transport sector measures per project category, showing that 52 % of all measures relate to infrastructure and 36 % relate to governance, specifically by supporting structural changes in the transport sector.

Figure 5. Total number of measures per project category



Data source: Own elaboration

Figure 6 below shows that all Member States have infrastructure and governance related measures (planned investments and reforms). It is clear that the number of measures varies between Member States and that there is not always a direct correlation between RRF funding per Member State and number of measures per Member State.

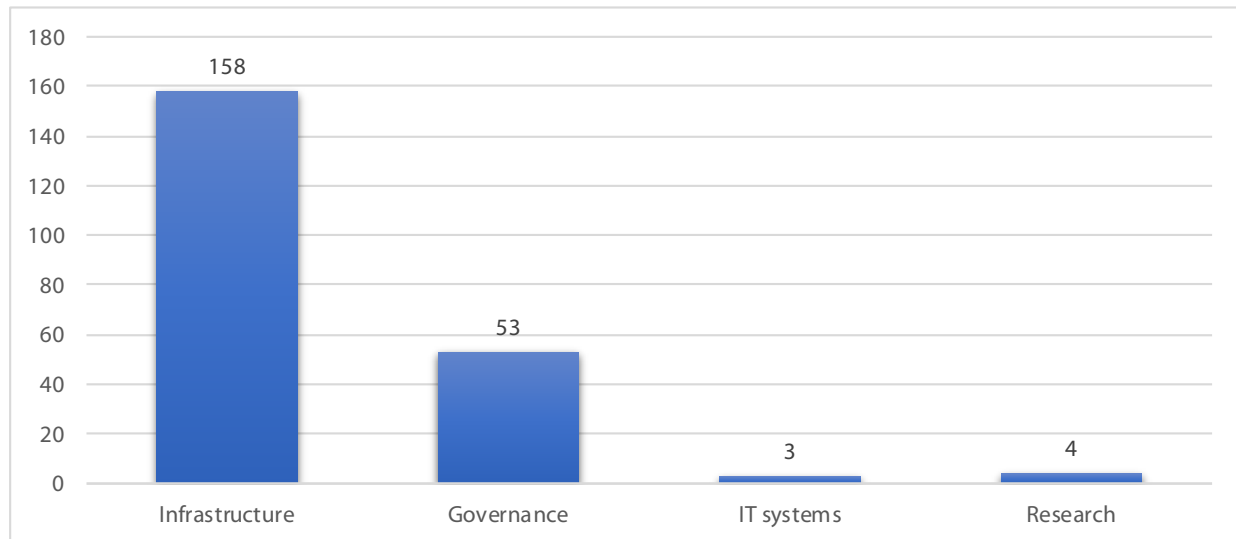
Figure 6. Number of measures per Member State

Data source: Own elaboration

In the following chapters, the transport sector related measures are assessed based on the 29 transport sector priorities - grouped under 'sustainable transport', 'smart transport', and 'resilient transport' - as defined in the Overview briefing and in Chapter 2 of this study.

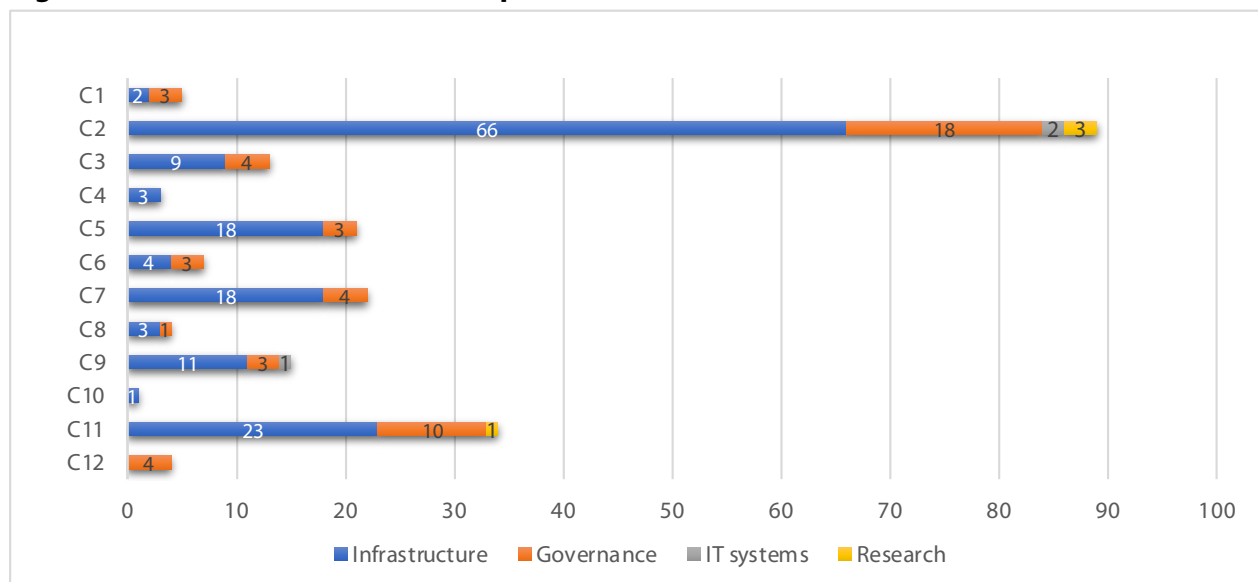
2.2. Sustainable transport

An assessment of the NRRPs showed that the total number of measures planned for sustainable transport is 218 (56% of all transport measures identified). Figure 7 below shows the number of measures per project category (infrastructure, governance, IT systems, and research). The largest number of measures, 73%, relates to infrastructure and 23% to governance.

Figure 7. Number of sustainable transport measures per project category


Data source: Own elaboration

The contribution of the NRRPS to sustainable transport is assessed based on 12 priorities⁵ (see figure 8 below).

Figure 8. Number of sustainable transport measures criteria C1 to C12


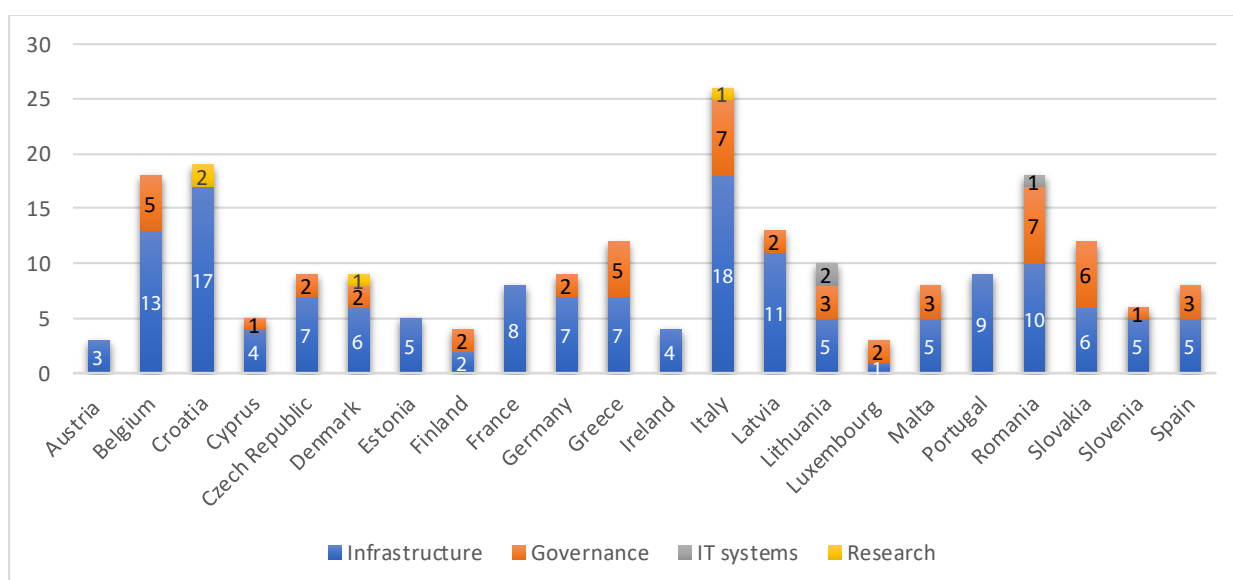
Data source: Own elaboration

There is a very high dominance of one priority (C2 – deployment of alternative fuels in road transport) and fewer projects for other sustainable transport policy priorities. Higher focus should have been placed on alternative fuels for urban transport. In addition, more projects and investments could have been planned for waterborne and rail transport, facilitating the modal shift, specifically from road to waterborne and rail transport.

The summary of each Member State's contribution per criteria is presented in figure 9 below and described in detail in the following subchapters. All Member States who's NRRPs have been assessed have sustainable transport related measures.

Figure 9. Number of sustainable transport measures per Member State

⁵ The full detail of the criteria can be found on page 26.

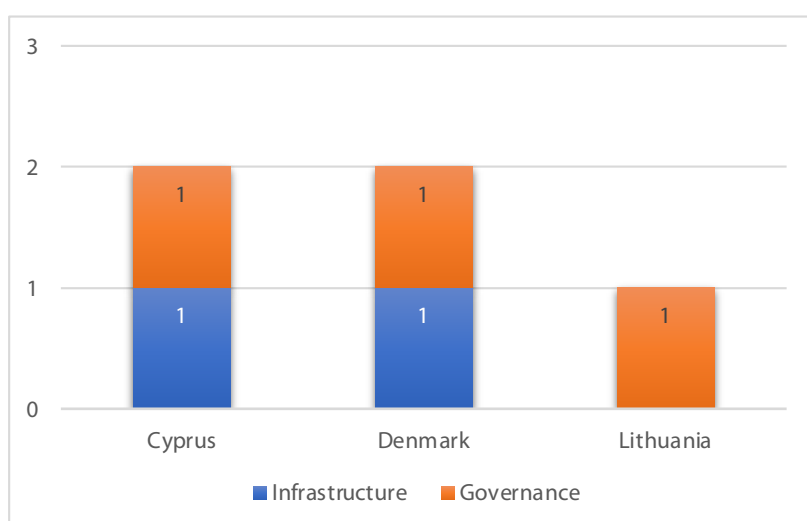


Data source: Own elaboration

2.2.1. C1 - Improve energy efficiency of road transport

Measures to improve the energy efficiency of road transport include reducing emissions from road transport modes, for instance by updating the technical requirements for the engine or tyres or roadworthiness tests with the aim of reducing emissions. Figure 10 below shows the total number of measures per Member State, highlighting that very few Member States implement projects related to the improvement of the energy efficiency of road transport.

Figure 10. Number of measures in C1 per Member State



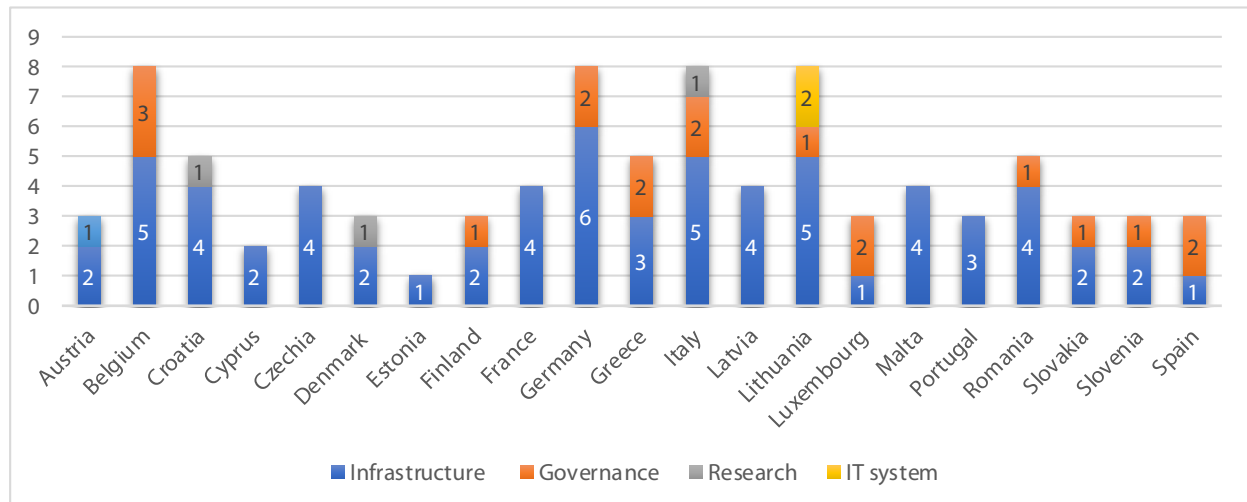
Data source: Own elaboration

The majority of planned measures relate to governance (3 measures), e.g. entry into force of the legislative acts related to phasing out the most polluting vehicles (**Cyprus**), analysis of national legislation (**Denmark**), entry into force of a legislative framework establishing a procedure for determining energy efficiency and environmental protection requirements for the purchase of road transport vehicles (**Lithuania**). Some measures include set targets, e.g. Lithuania includes support to acquire 23,500 clean transport vehicles and 25 electric buses.

2.2.2. C2 - Deployment of alternative fuels in road transport

Deployment of alternative fuels in road transport includes promoting the growth of an alternative fuels-based fleet. Almost all NRRPs assessed (21 out of 22) have planned measures related to the deployment of alternative fuels in road transport, with a total of 89 measures planned. Figure 11 below shows the number of measures per Member State.

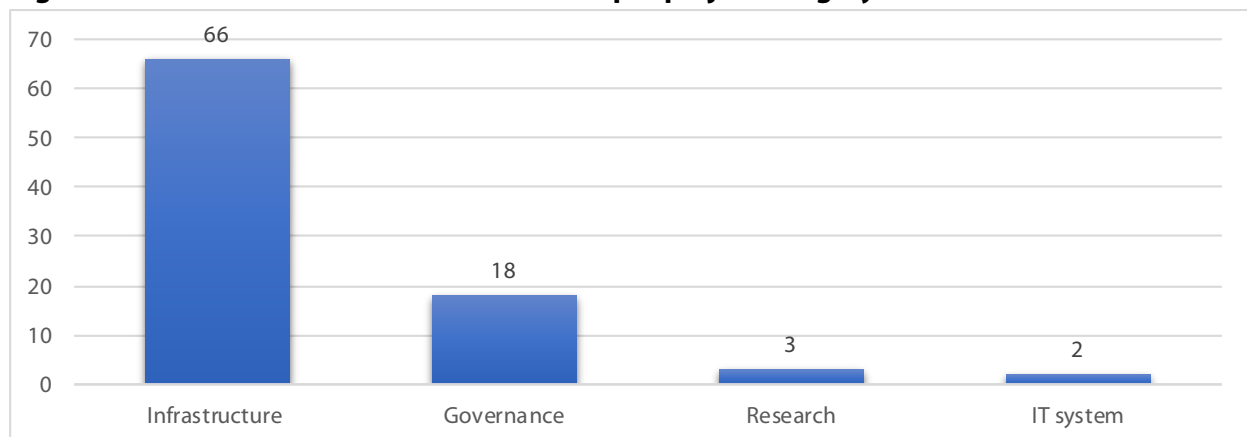
Figure 11. Number of measures in C2 criterion per Member State



Data source: Own elaboration

Many Member States link the investments in the alternative fuels infrastructure with related reforms in transport sector governance. Out of 89 measures, 74% are related to infrastructure and 20% to the governance. This proportion is represented in figure 12 below.

Figure 12. Number of measures in C2 criterion per project category



Data source: Own elaboration

The planned investments for many Member States are complex and include the acquisition of zero emission vehicles, the development of networks of charging stations, the implementation of the required changes in the regulatory framework and promoting the use of different types of fuel, e.g. hydrogen. In addition, solutions often include linking infrastructure and governance measures, or linking different infrastructure measures, e.g. supporting the switch to zero emission transport vehicles and development of charging stations network. Examples of measures within the Member States are provided in the box below.

Austria is converting 682 buses on the Austrian regular service and 2,767 utility vehicles to zero-emission busses and utility vehicles, respectively. **Belgium** is planning to 'green' the bus fleet (365 vehicles), investing in public and semi-public charging points and adopting a law on reforming the company car tax scheme. **Croatia** will build six hydrogen charging stations, purchase 70 alternative fuel-powered buses (electric and hydrogen), 2,000 electric vehicles and 1,300 electric charging stations.

Cyprus is installing 1,200 charging points to establish an electrical mobility infrastructure network and purchase up to 5,570 electric vehicles and electric bicycles. **Czech Republic** is planning to establish a 40 km long infrastructure network of recharging points, construction of residential infrastructure for 2,880 new recharging points, provide aid for new 4,555 zero-emission vehicles for private companies and to supply 1,485 zero-emission vehicles and 200 new charging stations to municipalities.

Denmark aims to change legislation, specifically by introducing a vehicle registration tax and a lower electricity tax specifically for charging electric vehicles. **Estonia** is planning to approve a legislative act setting out the terms and conditions for granting aid to switch to green water technology. **Finland** is developing a roadmap to reduce domestic transport emissions by at least 29% by 2025 by building 417 new recharging points for electric cars, 376 new high-voltage chargers, and 14 new liquefied biogas chargers.

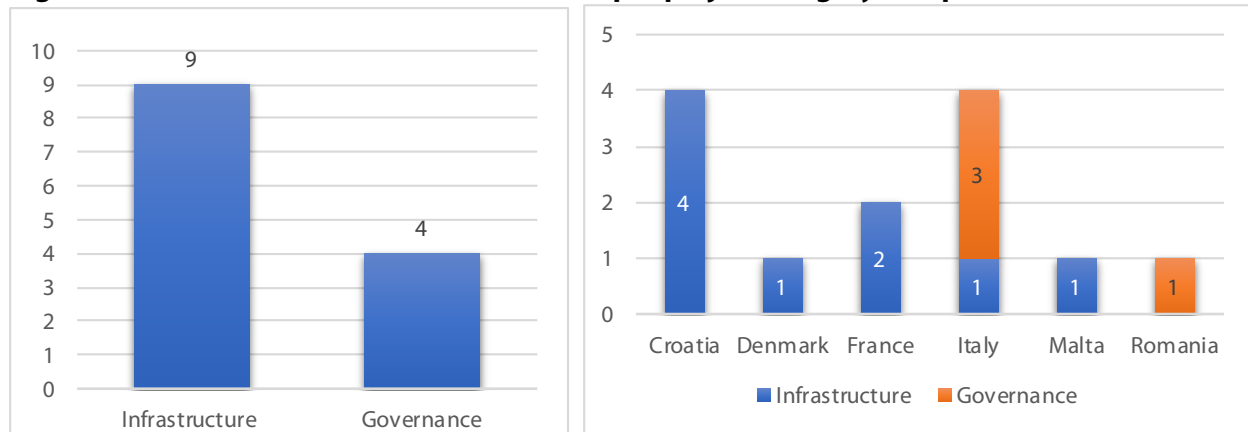
France is introducing support for the purchase of "clean" vehicles, aiming to provide this type of support to 127,000 people. **Germany** is planning hydrogen projects, electric mobility projects, 400,000 recharging points, 560,000 electric vehicles. **Greece** is developing 300 electric vehicle recharging points. **Italy** is planning to introduce 40 hydrogen-based charging stations, four hydrogen research projects, as well as changes in the regulatory framework for hydrogen, the installation of 13,000 high-speed charging stations on freeways and the refurbishment of the regional public transport fleet with clean fuel vehicles.

Latvia will introduce 21 environmentally friendly trams and buses in Riga. **Lithuania** is building a gas production facility, 58,420 charging points and 34 charging stations, 255 intercity electric buses and 23,500 environmentally friendly vehicles. **Luxembourg** is planning to introduce 2 600 charging points. **Malta** seeks to purchase 5,600 electric cars and replace 102 buses with electric ones in public transport. **Portugal** is installing 15,000 new charging stations and purchasing 2,500 electric cars and 145 new zero-emission (electric or hydrogen) buses.

Romania is planning to change the legislation to have higher taxes on more polluting vehicles. **Slovakia** aims to introduce new legislation on the long-term promotion of alternative fuels. **Slovenia** is installing 482 new recharging points. **Spain** is changing its legislation on public charging services.

2.2.3. C3 - Improving sustainability of waterborne transport and ports

Improvements in the sustainability of waterborne transport and ports include projects to improve energy efficiency, and to increase the uptake of alternative fuels in waterborne transport and the greening of ports. There are few Member States (six) who are planning improvements in their waterborne transport. The total number of measures planned is 13, including nine infrastructure and four governance measures. The planned measures relate to upgrading ports and ferry lines. Figure 13 below shows the number of measures planned per project category and per Member State.

Figure 13. Number of measures in C3 criterion per project category and per Member State

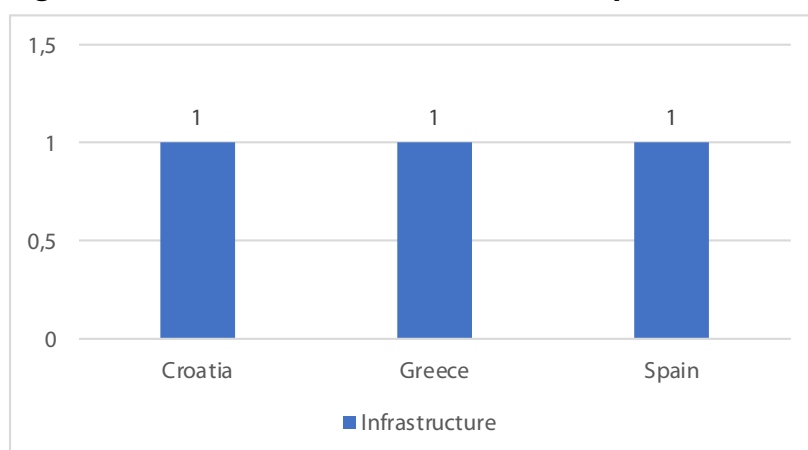
Data source: Own elaboration

Examples of measures are provided in the box below.

Croatia is planning measures that relate to the modernisation of two seaports open to public traffic, the construction of passenger ships to be used for regular coastal transport (six modernised fleets), the construction of a new cable ferry and equipping ports and harbours with waste management infrastructure. **Denmark** will exchange at least 15 ferries for green ferries. **France** is scheduling investments for the greening of their harbours. **Italy** is developing the National Strategic Platforms for the network of ports and freight villages to introduce the digitalisation of passenger and freight services. **Malta** is constructing a new ferry landing place. **Romania** is drafting its shipping strategy.

2.2.4. C4 - Improving sustainability of airborne transport and airports

Improvements in the sustainability of airborne transport and airports include prioritising the energy efficiency of airplanes and the uptake of alternative fuels in air transport, including creating cleaner airports. There are only four measures to improve the sustainability of airborne transport and airports and only three Member States are planning infrastructure measures (see figure 14 below).

Figure 14. Number of measures in C4 criterion per Member State

Data source: Own elaboration

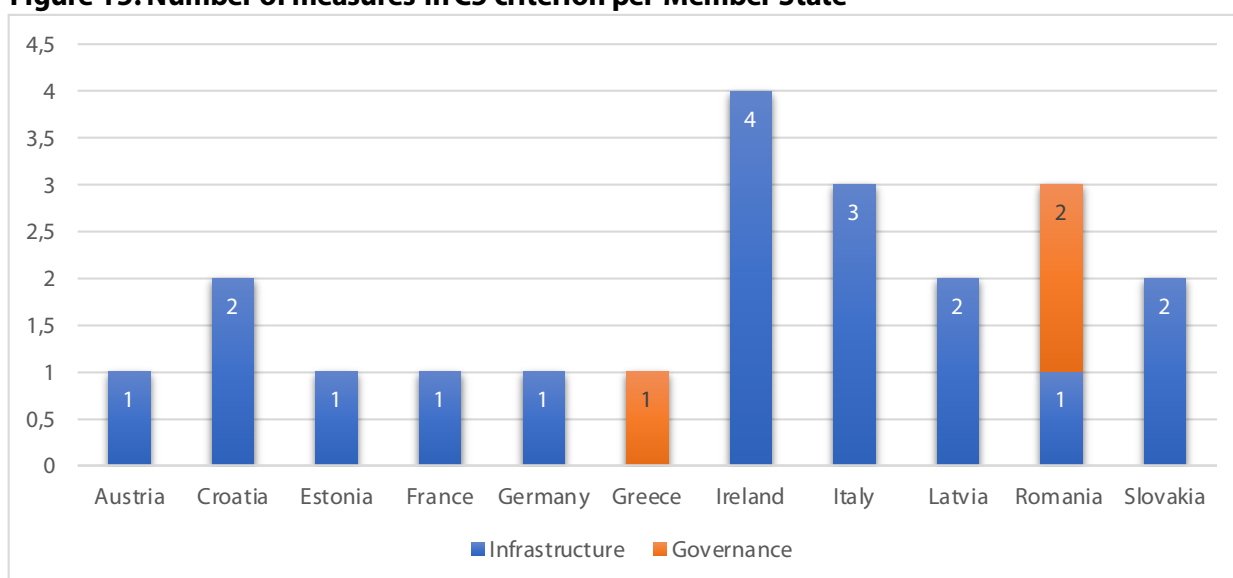
Examples of measures are provided in the box below.

Croatia is planning investments related to the electrification and greening of the ground handling and power supply system at Zadar airport. **Greece** is allocating investments to implement EASA compliance rectification works. **Spain** is launching activities around the Single European Sky project.

2.2.5. C5 - Improving sustainability of rail transport and rail terminals

Measures focusing on the sustainability of rail transport and rail terminals are focused on improving energy efficiency in trains, the uptake of alternative fuels in rail transport, the electrification of rail and building cleaner rail terminals. 11 Member States are planning measures, with 18 out of 21 measures relating to infrastructure and three to governance. Figure 15 below shows the total number of measures per Member State.

Figure 15. Number of measures in C5 criterion per Member State



Data source: Own elaboration

The box below provides examples of the planned projects, which will improve the sustainability of rail transport by line electrification, upgrading existing lines, constructing new lines, and acquiring new rolling stock.

Austria is constructing new railway lines and electrifying their regional railway lines. **Croatia** is reconstructing their existing railway lines, the construction of a second track and electrification, and two prototypes of battery trains. **Estonia** is planning the construction of a railway line sections. **France** is renovating 827 km renovation of railway lines. **Germany** is planning investments in 280 of their rolling stock.

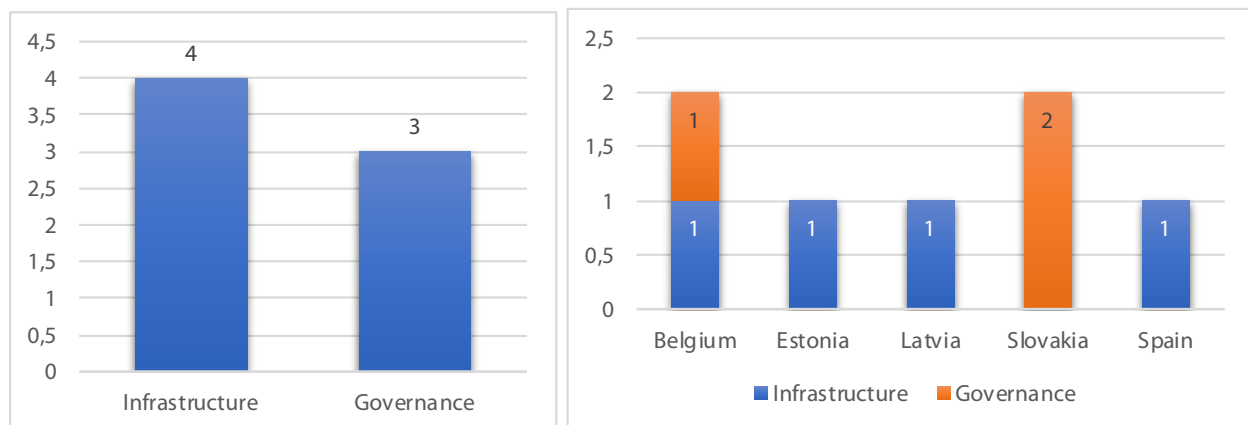
Greece is setting up a PPP contract to upgrade and redeploy the rail network. Several measures are planned in **Ireland** to enable future electrification of the Cork Commuter Rail. **Italy** is building ten hydrogen refuelling stations and the renewal of the regional public transport railway fleet. **Latvia** is electrifying 81km of railway and purchasing seven new rolling stock. **Romania** is planning ERTMS deployment, new electric rolling stock (262 locomotives) and improvement of institution capacity (governance). **Slovakia** is reconstructing 69 km of the railway lines and purchasing five new rolling stock.

The switch to rail is one of the EU's top priorities in the transport sector; however, only 11 Member States are planning to improve sustainability of rail transport and rail terminals, and this is mainly focused on electrification.

2.2.6. C6 - Improve multimodal transshipment locations to facilitate a modal shift

There are a few measures planned regarding multimodal transshipment locations to facilitate a modal shift. These involve improving the efficiency of multimodal transport (e.g., through efficient transshipment hubs or improved interoperability between modes) and creating a fully integrated and seamless intermodal system for passengers and freight. Five Member States are planning a total of seven measures. Figure 16 below shows the number of measures per project category and per Member State.

Figure 16. Number of measures in C6 criterion per project category and per Member State



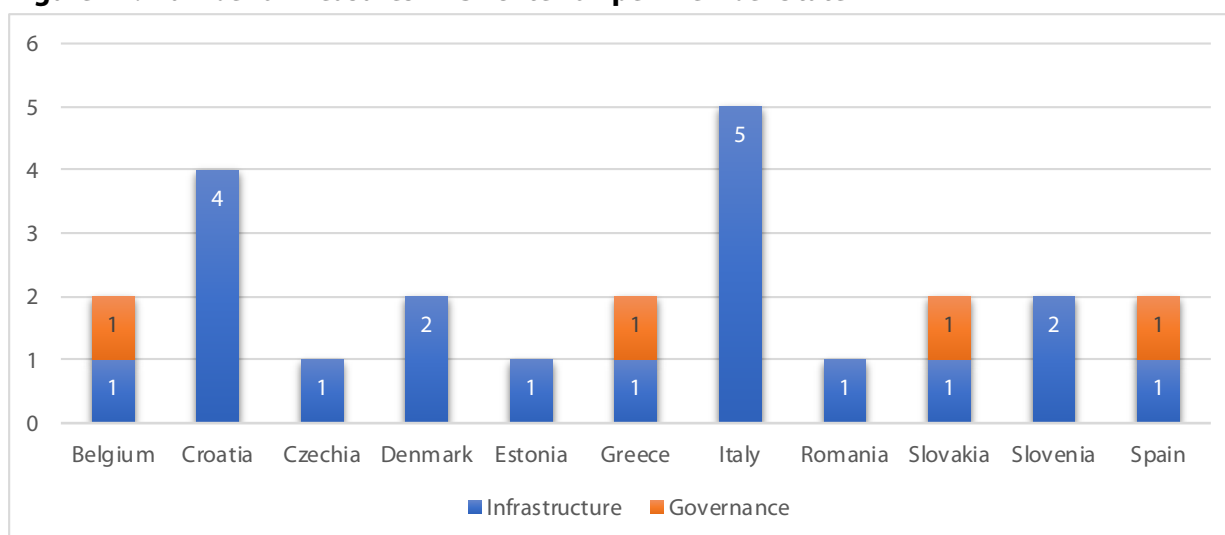
Data source: Own elaboration

Examples of measures are provided below.

Belgium is planning 5,000 modal shift grants. **Estonia** is constructing the Rail Baltica multimodal terminal building in Tallinn. **Latvia** is developing a unified multimodal public transport route network for the Riga metropolitan area. **Slovakia** is supporting schemes for intermodal transport development and intermodal transport units (1,000). **Spain** is planning the development of intermodal and logistics infrastructure.

2.2.7. C7 - Improve rail transport to facilitate a modal shift

Improvements of rail transport to facilitate a modal shift include investments to make both passenger and freight rail transport more attractive. 11 Member States are planning investments in 24 measures (see figure 17 below for the number of measures per project category and per Member State, and the following box for examples).

Figure 17. Number of measures in C7 criterion per Member State

Data source: Own elaboration

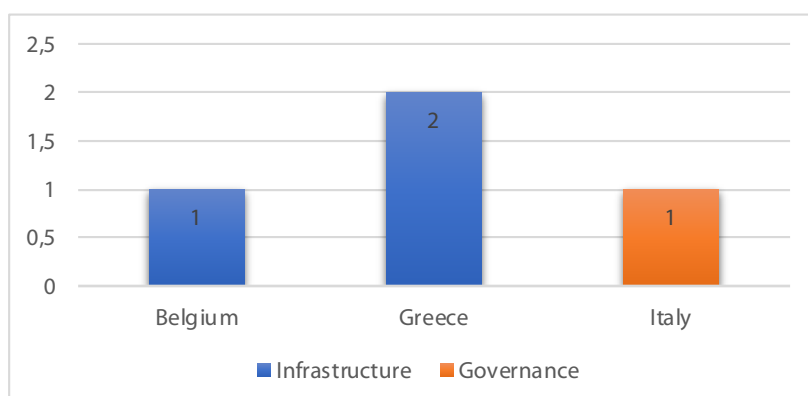
Belgium is renovating and modernising its railways. Similarly, **Croatia** is planning the modernisation of the railway line, the reconstruction of three stations and other activities. The **Czech Republic** is launching 56 environment improvement projects. **Denmark** is developing bike infrastructure (close to railway stations). **Estonia** is constructing of the Tallinn Old Port tramline.

Greece is introducing reforms in the railway sector and upgrading the suburban railway of West Attica. **Italy** is building high-speed railway lines and upgrading both regional lines and railway stations. **Romania** is planning the modernisation and renewal of 2,851 km of railway infrastructure. **Slovakia** is constructing cycling infrastructure and reconstructing 169 km of railway line. **Slovenia** is rebuilding two stations and improving 49 km of railway line. **Spain** has plans to improve 700 km of railway line and to build 920 stations.

11 Member States are planning projects mainly related to the further development of railway infrastructure. However, considering the importance of rail transport in the EU, higher focus could have been placed on further developing rail transport via a wider range of measures.

2.2.8. C8 - Improve water transport to facilitate a modal shift

Improvements in water transport to facilitate a modal shift predominantly include investments to make water transport more attractive for freight transport. Three Member States are planning investments in four measures (see figure 18 and the box below).

Figure 18. Number of measures in C8 criterion per Member State

Data source: Own elaboration

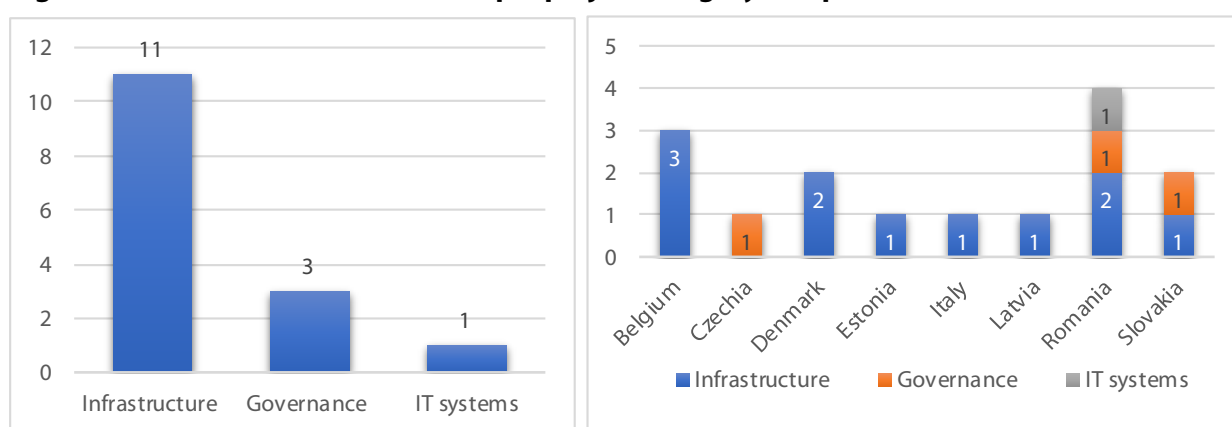
Greece will renew regional port agreements and the passenger fleet. **Italy** is in the process of simplifying the procedures for the strategic planning process for ports.

Only three Member States are planning to improve water transport to facilitate the modal shift, including port development and governance activities. However, a modal shift could be further promoted, not only by improving waterborne and rail transport, but also by introducing more active mobility including cycling and walking (under criterion C9).

2.2.9. C9 - Improve active mobility to facilitate a modal shift

Improvements in active mobility (cycling and walking) to facilitate a modal shift include facilitating the use of non-motorised means of transport, such as walking and cycling. Eight Member States are planning investments through 15 measures. Figure 19 below shows the number of measures per project category and per Member State.

Figure 19. Number of measures in C9 per project category and per Member State



Data source: Own elaboration

Examples of measures are provided in the box below.

Belgium is building cycle paths to introduce new 7,000 bicycle parking spaces and 25,000 m² of public outdoor space for pedestrians, cyclists and public transport in Brussel (Schuman area). **Estonia** is planning municipal investments in bicycle and pedestrian paths. **Italy** will introduce 1,800 km of cycling lanes. **Latvia** will build/renovate 60 km of cycling lanes in and around Riga. **Romania** has plans to complete a cycling run of 1,091 km and to carry out a study on the territorial distribution of cycling routes of national importance. **Slovakia** is planning to increase cycling infrastructure by 200 km.

2.2.10. C10 - Cross-border transport and interoperability

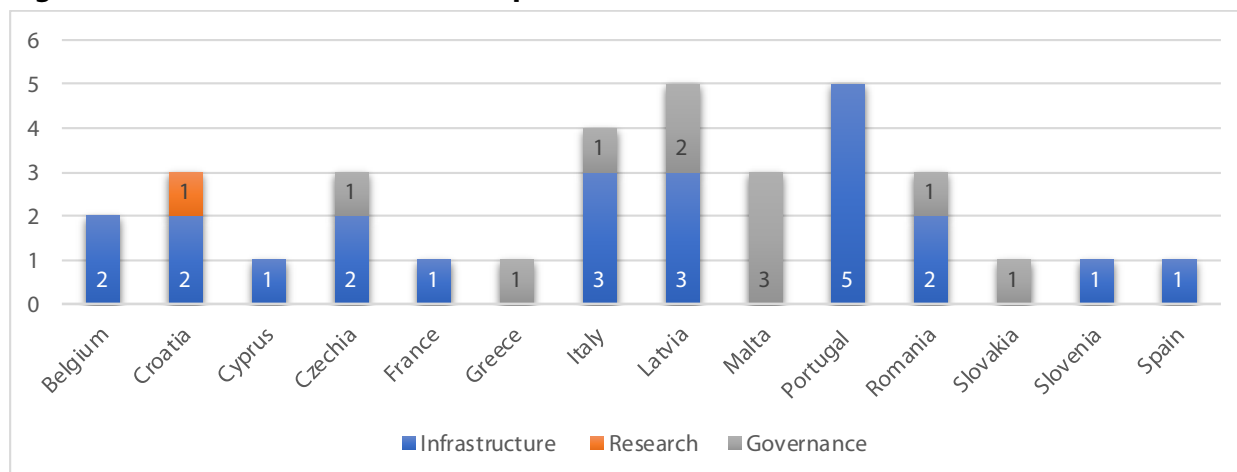
Under criterion "C10 - Cross-border transport and interoperability", only one measure is planned in Portugal, falling under the "Infrastructure" category, to create cross-border connections by building / restoring a 30 km long road section. It is thus evident that cross-border transport is not sufficiently addressed in the NRRPs.

2.2.11. C11 - Sustainable urban transport

Sustainable urban transport involves the reduction of congestion and emissions in urban areas and the promotion of the use of public transport, active forms of transport and new and innovative forms of transport. 14 out of 22 Member States are planning sustainable urban transport projects. The total

number of measures planned is 34, including 23 on infrastructure, 10 on governance and one on research measures. Figure 20 below shows the total number of measures per Member State.

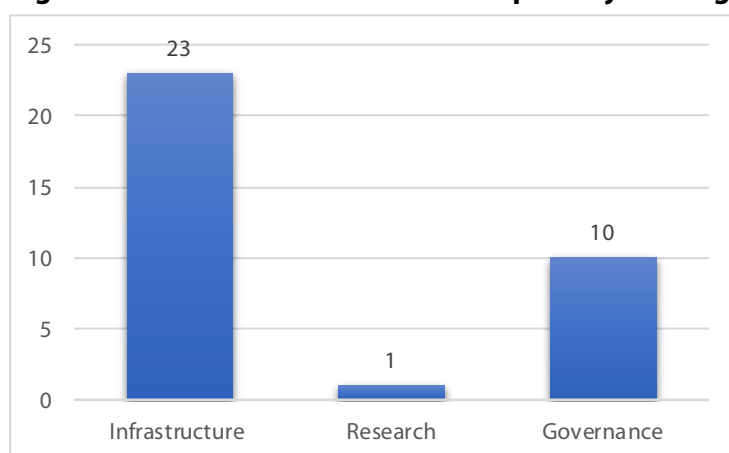
Figure 20. Number of measures in C11 per Member State



Data source: Own elaboration

The graph below shows the total number of measures per project category. Many Member States link the investments in infrastructure to reforms in transport sector governance. The total number of measures is 34, of which 68% are related to infrastructure and 29% to governance.

Figure 21. Number of measures in C11 per Project category



Data source: Own elaboration

Examples of measures are provided in the box below.

Belgium aims to improve public transport in the Walloon region, including six km of additional public transport infrastructure for zero-emission cars, 260 crossroads with smart road signals, and 400 crossroads with smart traffic lights. **Croatia** is developing 60 prototypes of fully autonomous and electric vehicle tests. **Cyprus** is creating 62 km of sustainable transport routes and 645 ancillary facilities related to sustainable transport. **France** is building a 100 km lane for the development of public transport. **Greece** will change legislation relating to public services, e-mobility, and recharging points.

Italy is building at least 231 km of public transport infrastructure, and 1,280 km of upgraded line sections built on metropolitan junctions and major national links. **Latvia** is planning to green the Riga Metropolitan Corridor Transport System, to promote a competitive railway passenger transport

in the city of Riga by modernising the 81 km electrified line and purchasing seven electric trains. **Malta** has plans to improve urban mobility solutions in line with the Sustainable Urban Mobility Plan.

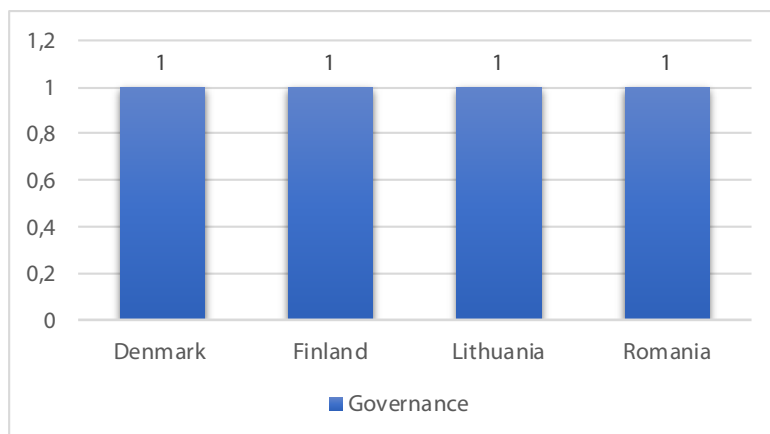
Portugal is planning to buy 145 clean buses, extend the Lisbon metro network by 3.7 km, extend the Porto Metro network by 6.7 km, the construction of a light rail transit line between Odivelas and Lures 13 km, and the construction of a high-speed bus line between Praça do Império and 3.8 km from Praça Albuquerque Mouzinho Porto. **Romania** is developing a 12.7 km underground transport network, purchasing 2,753 electronic vehicles, completing the cycling runway 1,091 km and introducing 13,200 recharging points. **Slovakia** is introducing a new law on public transport. **Slovenia** aims to reform the organization of public passenger transport. **Spain** has 305 projects to promote new forms of mobility.

14 Member States are planning measures that fall under criterion 'C11 – sustainable urban transport'. Some Member States link their planned projects to the priority "alternative fuels in road transport" (C2). However, considering the importance of increasing the role of public transport and making it more sustainable, more actions could have been planned regarding the greening of public transport.

2.2.12. C12 - Internalising external costs of transport

Internalising external costs of transport involves introducing incentives for transport users to make more sustainable choices, e.g. via carbon pricing, taxation and more infrastructure charging points. Four Member States out of 22 have measures related to internalising external costs of transport, with a total of four measures planned. Figure 22 below shows the number of measures planned per Member State.

Figure 22. Number of measures in C12 per Member State



Data source: Own elaboration

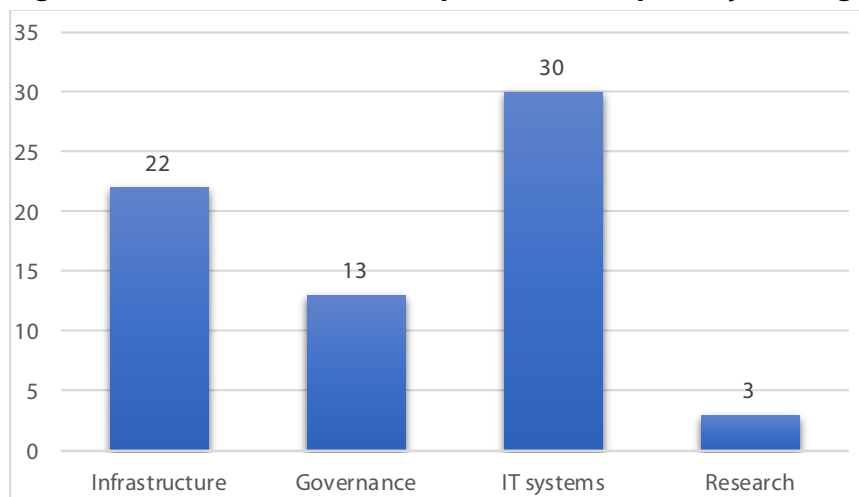
Examples of measures are provided below.

In **Denmark** an agreement will be reached between the government and the parliamentary majority on the management of the inspection systems. **Finland** is planning a tax reform on the taxation of company cars. **Lithuania** will purchase and register 23,500 clean vehicles and 25 electric buses. **Romania** is adopting a railway infrastructure development strategy and publishing and implementing a national action plan for the European Rail Traffic Management System (ERTMS).

2.3. Smart transport

Smart transport is the second priority area of the EU's transport policy. Based on the assessment of the NRRPs, the total number of measures planned for smart transport amounts to 68. Figure 23 below displays the number of measures per category (Infrastructure, governance, IT systems and research), which shows that the largest share of measures (41%) relate to IT systems and 32% relate to infrastructure.

Figure 23. Number of smart transport measures per Project category

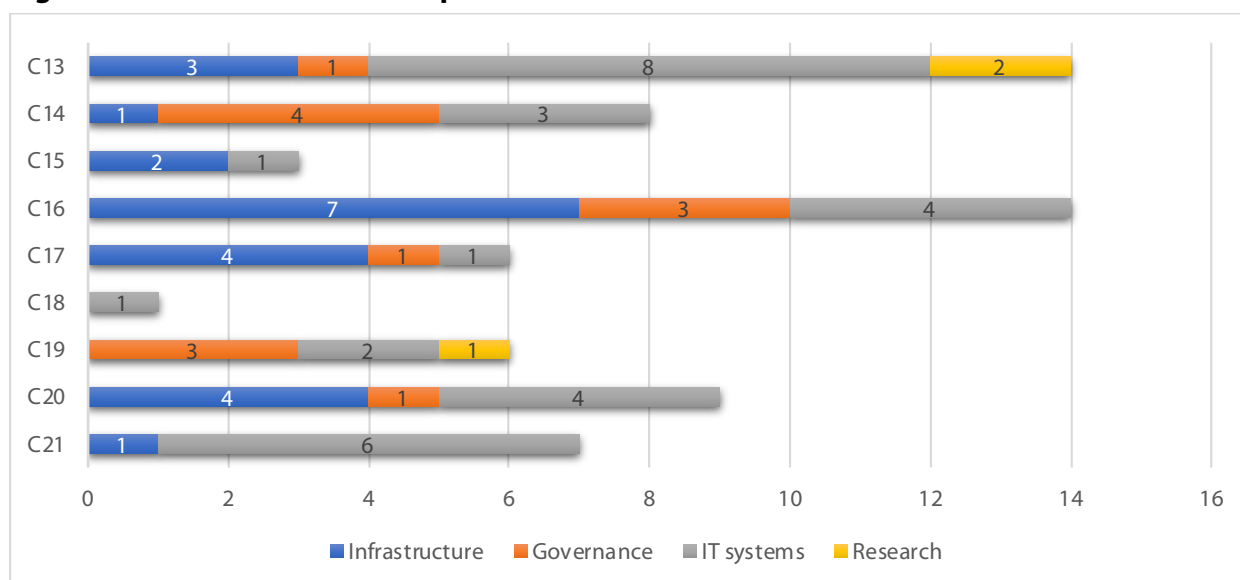


Data source: Own elaboration

The contribution of the NRRPs to smart transport is assessed based on nine criteria and the summary of Member States contribution per criteria is presented in figure 24 below and described in detail in the following subchapters.

The theme “smart transport” is characterised by a high number of IT related projects, including software and IT infrastructure development. The NRRPs include a limited number of research projects to achieve transport sector policy priorities.

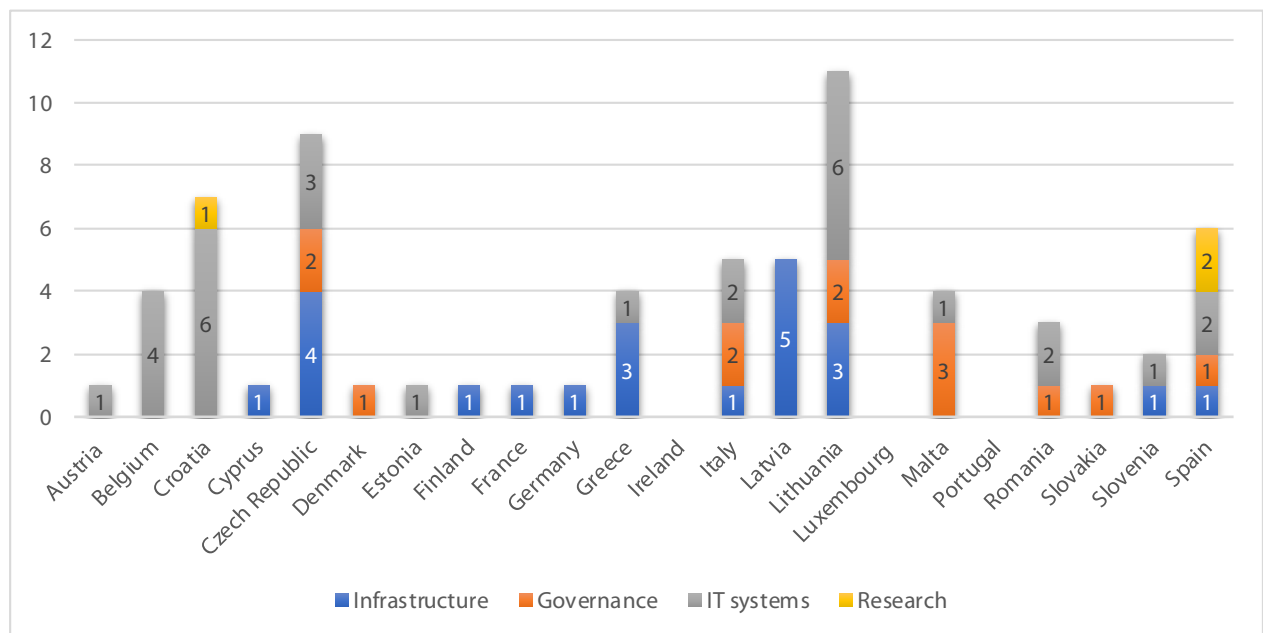
Figure 24. Number of smart transport measures criteria C13 to C21



Data source: own elaboration

Almost all Member States (19 out of 22) planned smart transport related measures (see figure 25 below), described in detail in the following subchapters.

Figure 25. Number of smart transport measures per Member State

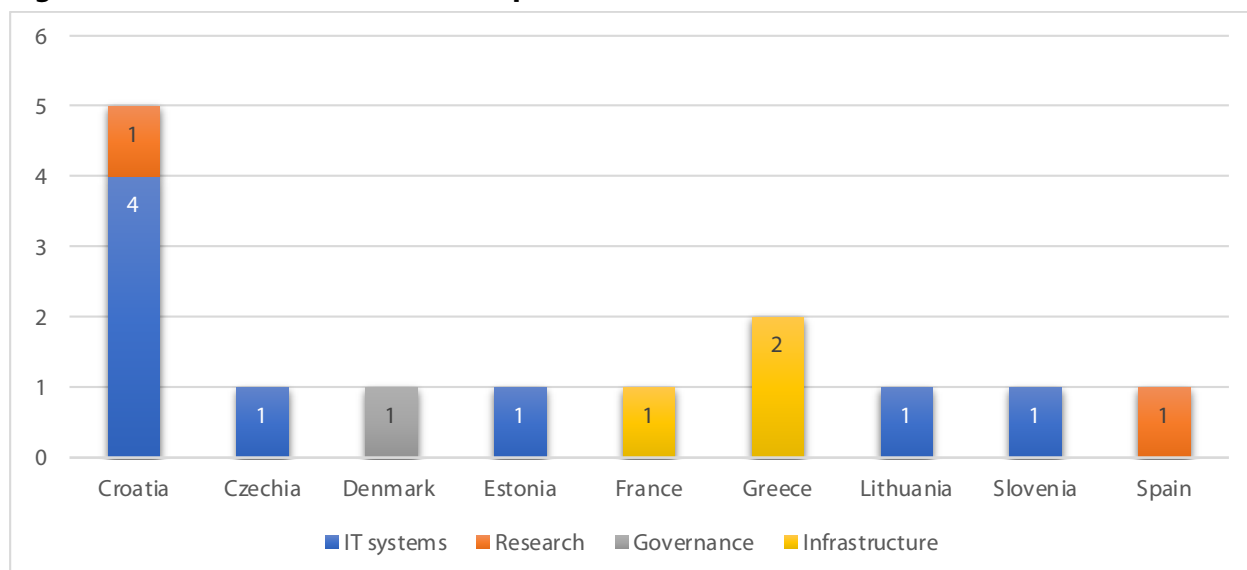


Data source: Own elaboration

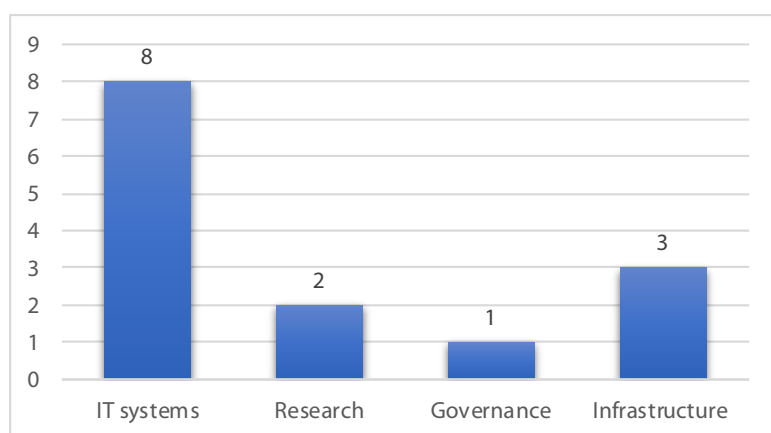
2.3.1. C13 - Smart mobility in road transport

Smart mobility in road transport includes improvements in freight and passenger transport. There are nine Member States out of 22 planning to introduce measures on smart mobility in road transport (see figure 26 below). There are a total of 14 measures planned, predominantly on IT systems (8) and some on infrastructure (3), research (2) and governance (1) (see figure 27 below).

Figure 26. Number of measures in C13 per Member State



Data source: Own elaboration

Figure 27. Number of measures in C13 per Project category

Data source: Own elaboration

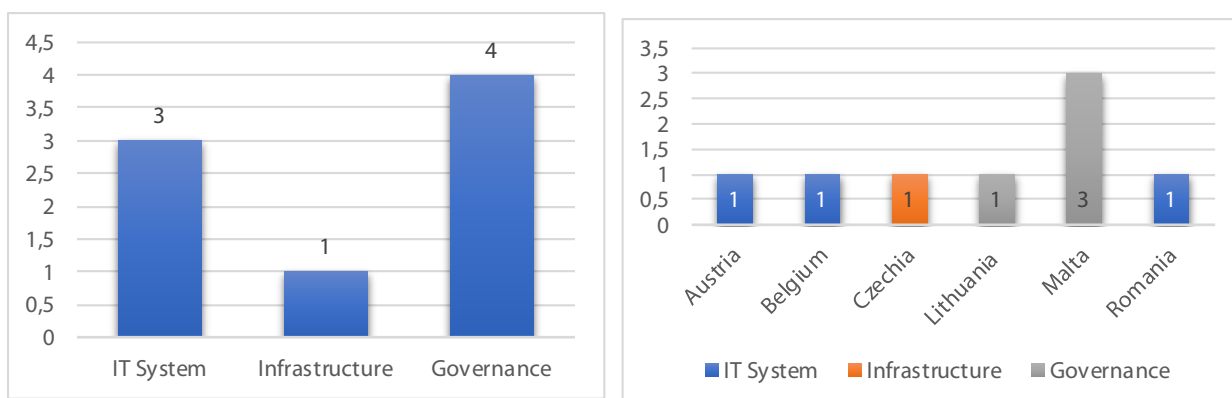
Examples of measures are provided in the box below.

Croatia is planning to develop a new electronic tolling system, a national electronic storage system, a data exchange system, and control systems for road transport, as well as monitoring systems for the transport of dangerous goods by road. The **Czech Republic** is developing 5G corridors. In **Germany**, information campaigns are planned on traffic jams and car-sharing.

Estonia is focusing on developing electronic freight information platforms. In **France**, projects are aimed at speeding up the work on transport infrastructure. **Greece** is focusing on the completion of the electronic tolling project. **Slovenia** is digitalising its road infrastructure. In **Spain**, support was planned for 35 companies to carry out research, development and innovation projects.

2.3.2. C14 - Smart mobility for multimodal passenger transport

Smart mobility for multimodal passenger transport includes smart solutions to improve passenger transport between modes. Six Member States are planning investments in eight measures. Those measures are linked with the development of alternative fuel (under criterion C2) and urban transport measures. Figure 28 below provides a breakdown of the measures.

Figure 28. Number of measures in C14 per Project category and per Member State

Data source: Own elaboration

Examples of measures are provided in the box below.

Austria will purchase 20,000 zero-emission vehicles, set up 100 charging stations, and develop up to 1,300 energy-saving companies and up to 10,800 solar energy storage facilities. A smart relocation program is planned for **Belgium**. In the **Czech Republic**, 5G demonstration application projects are planned, involving a total of 250 SMEs. **Lithuania** will purchase 230 zero-emission buses.

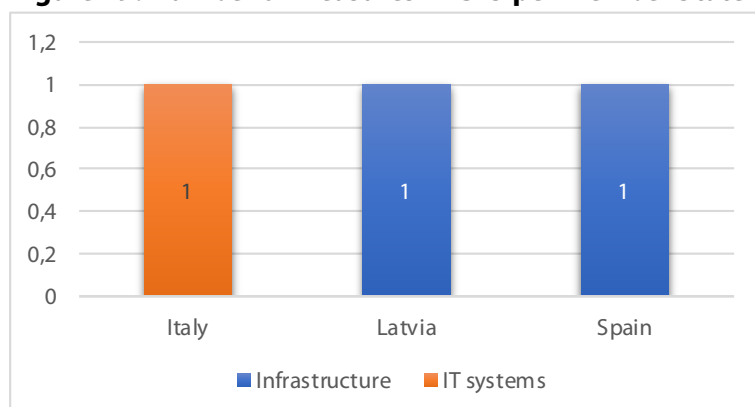
Malta plans to adopt and implement policies that promote the sustainability of the transport sector, including the promotion of collective and intermodal transport and the publication of a Sustainable Urban Mobility Plan for the Valletta Region (nine administrative units). In **Romania**, intelligent transport systems and e-marketing infrastructure will be set up in 491 administrative units, 13,200 charging points built and 2,735 zero-emission vehicles (buses, trolleybuses, trams and minibuses) bought.

For other transport modes, there is a limited number of “smart transport” measures.

2.3.3. C15 - Smart mobility for multimodal freight transport

Smart mobility for multimodal freight transport includes smart solutions to improve freight transport between modes. Only three Member States have a total of three measures related to the improvement of freight transport between modes, as indicated in figure 29 below.

Figure 29. Number of measures in C15 per Member State



Data source: Own elaboration

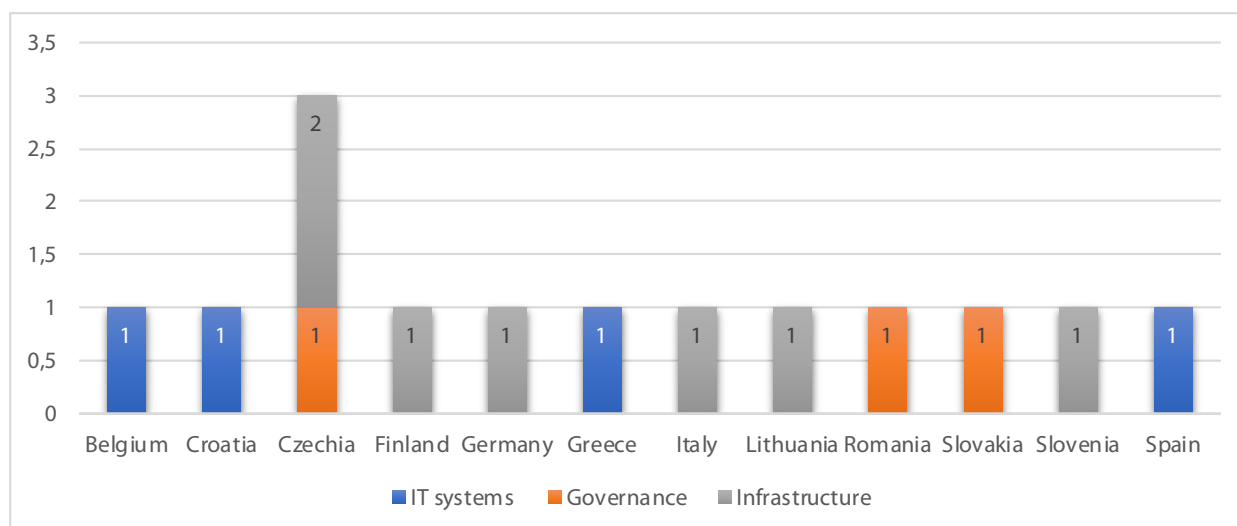
Examples of measures are provided in the box below.

Italy is digitalising logistics chains for 70% of its port community systems. **Latvia** is planning to use artificial intelligence for rail freight scanning image analysis. **Spain** is modernising intermodal and logistics infrastructure.

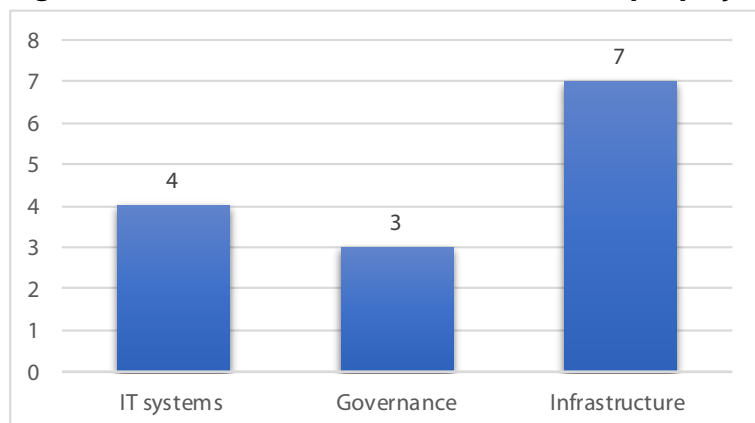
There is a greater need for smart solutions facilitating multi-modal transport, including data exchange between service providers and developing user friendly platforms for services provided. In addition, considering the planned shift to rail and waterborne transport for freight, there is a need for smart solutions to facilitate the ease of cargo flows.

2.3.4. C16 - Smart mobility in rail transport

12 Member States are planning smart mobility actions in rail transport (see figure 30). The total number of measures planned is 14, including four IT systems, seven infrastructure and three governance measures (see figure 31).

Figure 30. Number of measures in C16 per Member State

Data source: Own elaboration

Figure 31. Number of measures in C16 criterion per project category

Data source: Own elaboration

Examples of measures are provided in the box below.

The development of IT systems is planned in **Belgium**. **Croatia** is modernising their train ticketing system. In the **Czech Republic**, 5G studies will take place as well as the creation and promotion of 5G corridors. In **Finland**, a 50 km long test track on railway infrastructure equipped with ERTMS radio will be developed. In **Germany**, seven projects are planned to promote the digitalisation of railways. In **Greece**, the digital transformation project will be finalised. **Italy** and **Romania** are planning to introduce ERTMS.

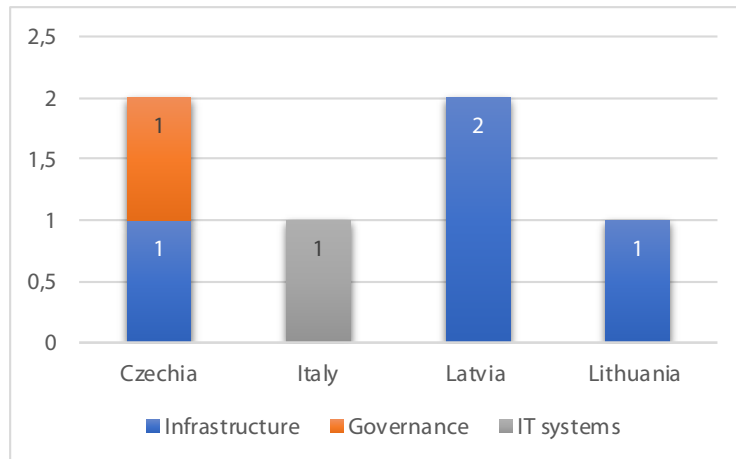
Lithuania is planning to set up a 5G service on the railway line. In **Slovakia**, tariff integration with six counties is planned, allowing for multi-modal public transport travel, or travel by carriers with one ticket. **Slovenia** is planning to equip 32 locomotives with ETCS. **Spain** is digitalising 920 stations, modernising 700 km of short-distance rail lines and introducing investments in short-distance lines.

Smart mobility in rail transport is focused on ERTMS deployment. Considering the importance of ERTMS as part of the TEN-T requirements, even more measures could be planned and more Member States could be focusing on “smart transport” for road and rail.

2.3.5. C17 - Smart mobility in aviation

There are a total of six measures around smart mobility in aviation, e.g. the implementation of a Single European Sky, implemented by four Member States (see figure 32).

Figure 32. Number of measures in C17 per Member State



Data source: Own elaboration

Examples of measures are provided below.

The **Czech Republic** is planning to support research and innovation in the aviation sector. **Italy** is digitalising its air traffic management. **Latvia** will purchase and install a spectrophotometer for use at the airport customs control point. In **Lithuania**, a 5G guide at airports will be developed.

2.3.6. C18 - Smart mobility in waterborne transport

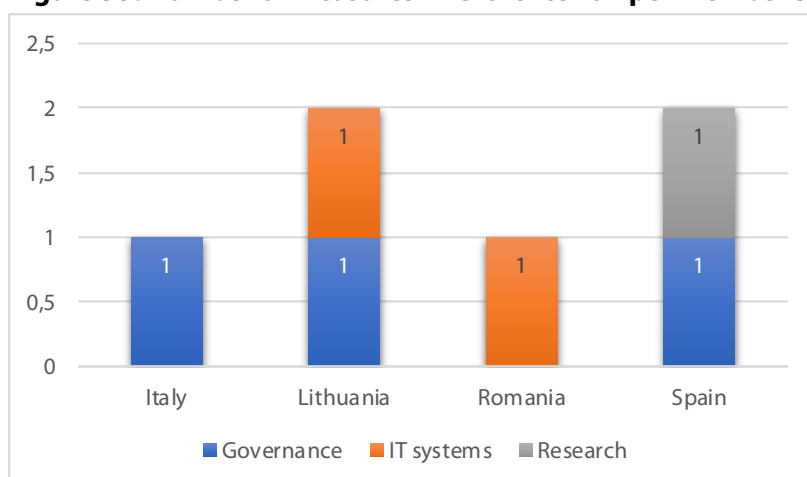
Smart mobility in waterborne transport includes the deployment of automated and autonomous maritime operations. Only one Member State (Malta) has an initiative planned in this area (see box below).

Malta plans to digitalise the ships' files by scanning 15,000 files and provide technical training to 135 staff.

Considering the need to shift to waterborne transport, more focus needs to be placed on introducing smart waterborne transport solutions.

2.3.7. C19 - Innovation in smart mobility technology

Innovation in smart mobility technology includes creating favourable conditions for the development of new technologies and services (e.g. the use of AI, drones, autonomous vehicles, hyperloop, hydrogen aircraft, electric personal air vehicles, electric waterborne transport and clean urban logistics) and introducing all necessary legislative tools for their validation. Four Member States have introduced a total of six measures. Figure 33 below shows the number of measures planned per Member State and category.

Figure 33. Number of measures in C19 criterion per Member State

Data source: Own elaboration

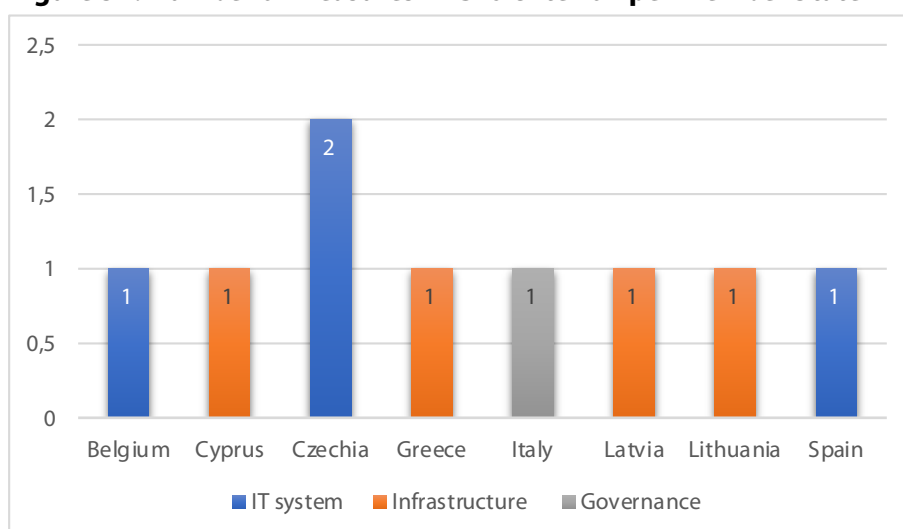
Examples of measures are provided in the box below.

Italy plans to introduce Mobility-as-a-Service (MaaS). **Lithuania** is increasing digital solutions and designating a competent authority for the administration of transport innovation measures. **Romania** is creating an integrated national eVelo platform and smartphone application. **Spain** plans to develop a secure, sustainable, and connected mobility strategy and to support 35 companies with research and development projects in the sustainable automotive sector.

“Smart transport” solutions and related IT projects planned by Member States are focused only on specific transport modes, with limited projects that cover a wider range of topics, for instance smart platforms.

2.3.8. C20 – Developing digital infrastructure to enable smart mobility

The development of digital infrastructure for enabling smart mobility includes building network infrastructure, cloud-to-edge resources, data technologies, 5G and optic fibre. There are nine measures undertaken by eight Member States; this includes IT projects and developing digital infrastructure for smart mobility, focusing on 5G deployment (see figure 34 below).

Figure 34. Number of measures in C20 criterion per Member State

Data source: Own elaboration

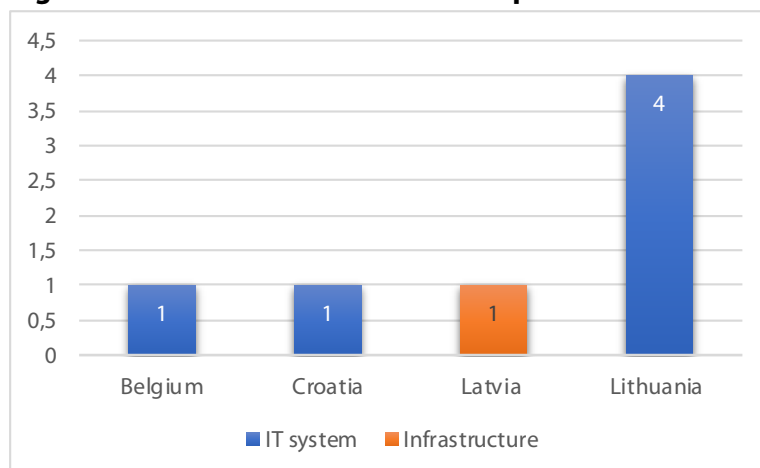
Examples of measures are provided in the box below.

Belgium is planning projects on the unlocking of Open Data for Smart Mobility application. **Cyprus** is establishing ITS by using digital twin technologies. The **Czech Republic** is deploying electronic communications networks. **Greece** will develop a 5G network. **Italy** has plans to create a strategic platform for a network of ports and freight villages. **Latvia** is building passive infrastructure on the Via Baltica corridor for 5G coverage. **Lithuania** aims to deploy 5G services in various urban areas. **Spain** is planning to set up a support program for "sustainable and digital transport".

2.3.9. C21 - Supporting data availability, access, and exchange of mobility data

There are a total of seven measures to support data availability, access and the exchange of mobility data, including the development of data formats to enable data exchange and developing national data storage systems and platforms, implemented by four Member States (as shown in figure 35 below).

Figure 35. Number of measures in C21 per Member State



Data source: Own elaboration

Examples of measures are provided in the box below.

Belgium intends to adopt a legal framework for the commissioning and monitoring of vehicle emissions, which combines emission data with periodic technical and road safety inspections. **Croatia** plans to establish a well-functioning national electronic storage and data exchange system for road transport. **Latvia** is planning to introduce a platform for the analysis of scanned images of railway freight, as well as a spectrophotometer for use in the customs laboratory. **Lithuania** is modernising systems and data analysis tools, as well as the designated competent authority.

Cross-border travel was not sufficiently addressed under the theme "sustainable transport". Not only could the number of measures be increased, but also the nature of projects should instead focus more on data exchange between Member States, thus facilitating smooth cross-border travel for passengers and efficient cargo flow.

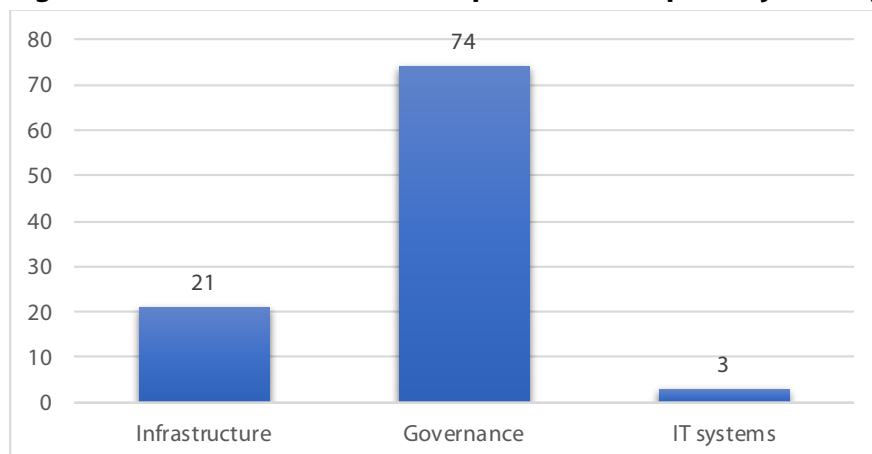
2.4. Resilient transport

Resilient transport is the third priority area of the EU, under which there are eight sub-priorities. This theme is broad and includes topics such as governance of transport investments, fair and just transport, infrastructure development and resilience against network disruptions. Not all transport sector

measures could be linked to the EU's transport sector priorities, therefore an additional criterion has been introduced – “C30 - other priorities”.

Based on the assessment of the NRRPs, the total number of measures planned for resilient transport is 98 (25% of all transport measures) and almost all (21) of the Member States have resilient transport related measures in place. Figure 36 below shows the number of measures per project category (infrastructure, governance, IT systems), mostly governance measures (75%).

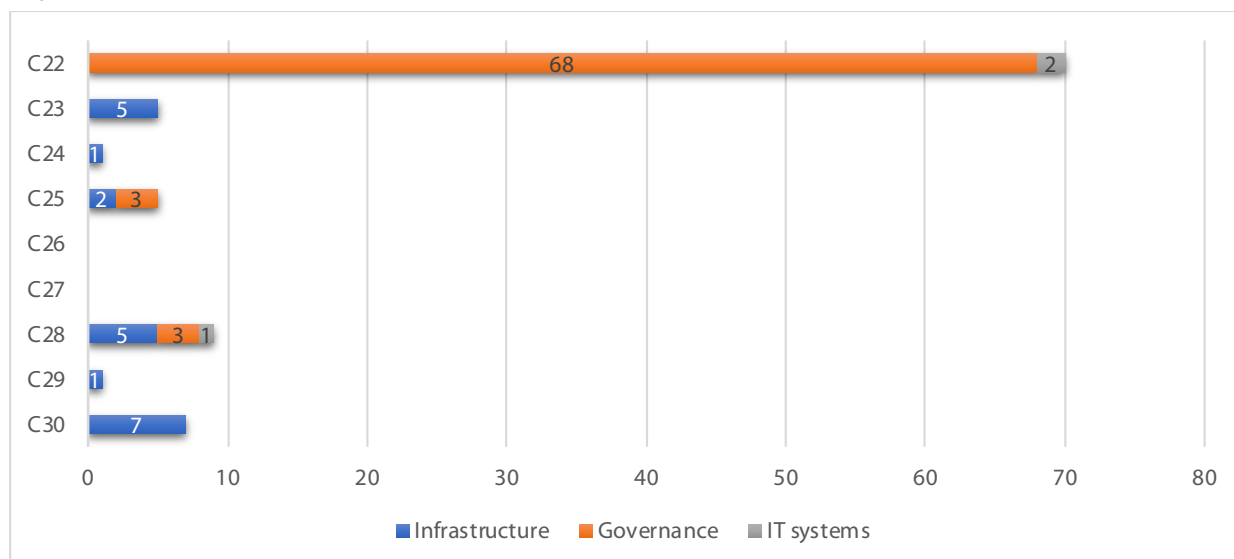
Figure 36. Number of resilient transport measures per Project category



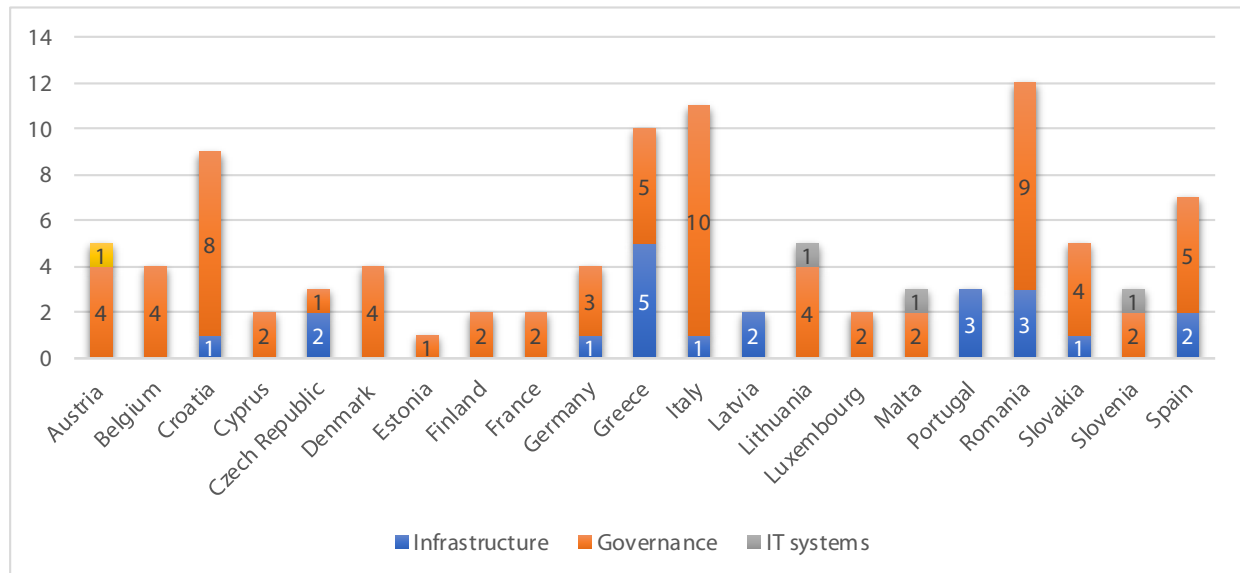
Data source: Own elaboration

The contribution of the NRRPs to resilient transport is assessed on the basis of eight criteria, an overview of which can be seen in figure 37 and 38 below and discussed in more detail in the rest of this chapter.

Figure 37. Number of resilient transport measures criteria C22 to C30



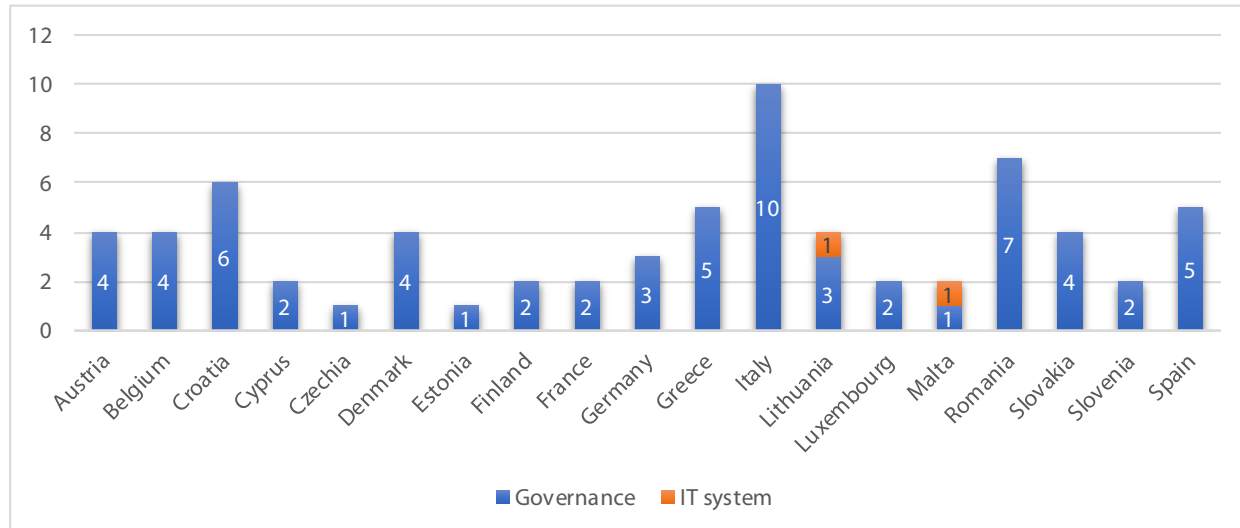
Data source: Own elaboration

Figure 38. Number of resilient transport measures per Member State

Data source: Own elaboration

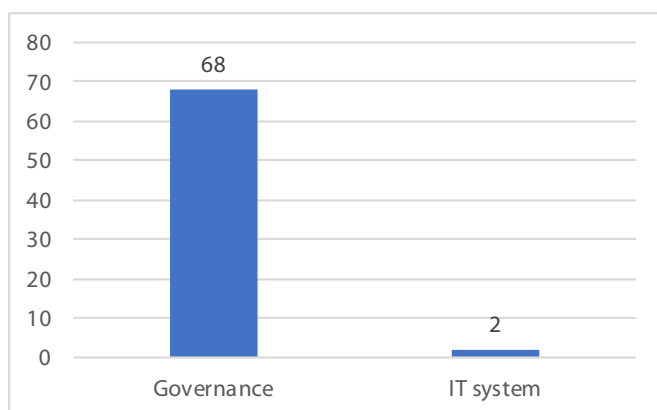
2.4.1. C22 - Improve transport sector governance

Measures to improve governance in the transport sector are focused on simplifying governance procedures or providing support to businesses in the transport sector. There are 19 Member States who are planning initiatives under this priority, as figure 39 below shows.

Figure 39. Number of measures in C22 per Member State

Data source: Own elaboration

Figure 40 below shows the total number of measures per category, of which 68 predominantly focus on governance. The governance measures include developing transport master plans, enhancing regulatory framework and introducing transport sector reforms. Some Member States are planning more complex solutions by combining governance with infrastructure improvements (e.g. alternative fuels for road transport).

Figure 40. Number of measures in C22 per Project category

Data source: Own elaboration

Examples of measures are provided in the box below.

Austria is planning to implement a mobility master plan, which will lead to a reduction of CO₂ emissions. **Belgium** intends to adopt a legal framework for the monitoring of vehicle emissions and to create an IT system that combines emissions data with periodic technical and road safety inspections. The **Croatian** government will adopt amendments to the Road Safety Program 2021-2030, as well as a reform of the railway sector and a reform of maritime and inland navigation. In **Cyprus**, legislation is being introduced to develop charging points for electric vehicles and for the decommissioning of all polluting vehicles. In the **Czech Republic** the approval and introduction of a new freight transport concept is planned.

Denmark is implementing new legislation on vehicle taxation and charging for electric vehicles, as well as an analysis of the regulation on weights and dimensions to optimize heavy transport. **Estonia** plans to adopt a transport and mobility development plan for 2021-2035. In **Finland**, a roadmap for low-carbon solutions for cities and transport is being drafted. In **France**, a legislation on mobility and a green budget will be developed.

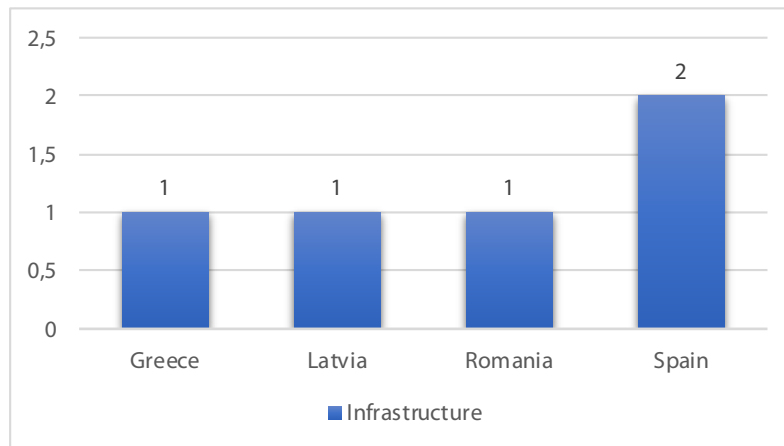
In **Germany**, an amendment to the Vehicle Tax Act and the entry of Act III of the Acceleration of Planning, as well as the establishment of a hydrogen technology and innovation centre, is planned. **Greece** is introducing measures to modernise and improve the resilience of key sectors of the economy. **Italy** intends to simplify administration processes and reduce regulatory barriers on hydrogen. In **Lithuania**, a competent authority for the administration of transport innovation activities will be set up and this authority will be responsible for implementing digitalisation solutions, electronic document ecosystems, state tax inspectorates and customs vehicle registration systems.

Luxembourg is planning an additional measure for the purchasing of clean vehicles (Grand Ducal Regulation) and the introduction of an additional 2,600 recharging points. **Malta** is planning to publish a Sustainable Urban Mobility Plan. **Romania** plans to draft laws to increase taxes for polluting vehicles. In **Slovakia**, amendments will be made to the railway law and related legislation on transport infrastructure parameters, as well as a new Law on Public Passenger Transport developed. **Slovenia** is planning a reform of the organization of public passenger transport. **Spain** is planning amendments to the Low Voltage Electrotechnical Regulations and the approval of the Royal Decree on Public Paid Services, as well as the adoption of the Law on Transport Mobility and Financing.

2.4.2. C23 - Completion of the TEN-T

Completion of the TEN-T includes ensuring that transport sector infrastructure complies with the technical requirements set out in the TEN-T Regulation. Compliance is stipulated for the Core Network by 2030 and the Comprehensive Network by 2050. There are five measures in total relating to the completion of the TEN-T Core Network (see figure 41 below for the breakdown per Member State). These measures are dedicated to TEN-T development, but as the next chapters will show, there are many other measures which also contribute to the achievement of TEN-T objectives.

Figure 41. Number of measures in C23 per Member State



Data source: Own elaboration

Examples of measures are provided in the box below.

Greece is planning a development of 5G network. **Latvia** is constructing the passive infrastructure on the Via Baltica Corridor for 5G network coverage. **Romania** plans to develop sustainable road infrastructure in the TEN-T network of 1,339 km. **Spain** will complete 1,400 km of the TEN-T CNC and 900 km on other modes of transport.

The completion of TEN-T is the target for all Member States and numerous measures have been introduced to achieve this, discussed in the next chapter of this study. For this part of the study, TEN-T projects are counted only when TEN-T is included in the project description.

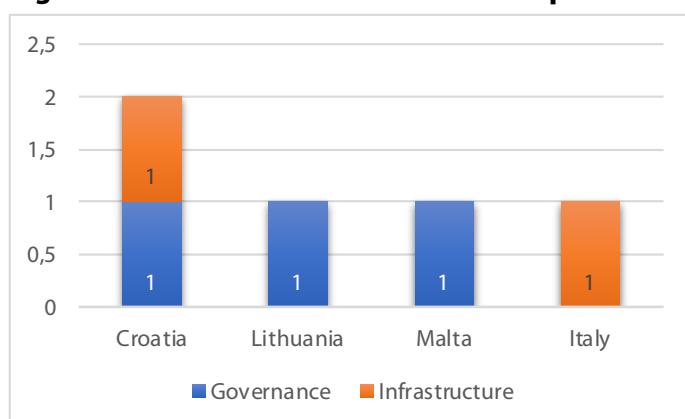
2.4.3. C24 - Improve resilience of the transport system against disruptions

There are limited measures aimed at improving the resilience of the transport system against disruptions, mostly the development of crisis contingency plans.

Only one country, **Greece**, has a relevant measure to introduce a vehicle manufacturer and supply sector investment program.

2.4.4. C25 - Fair, accessible, and just mobility and passenger rights

Fair, accessible and just mobility and passenger rights includes measures that make mobility more affordable and accessible for disadvantaged groups, such as disabled persons, people with low ICT-literacy or those from remote areas. Four Member States have introduced five measures in total, as shown by figure 42.

Figure 42. Number of measures in C25 per Member State

Data source: Own elaboration

Examples of measures are provided in the box below.

Croatia is planning to improve the extent to which people with disabilities can exercise their rights in the field of mobility. **Lithuania** is introducing legislation around an electronic road toll system based on the 'user pays' and 'polluter pays' principles. **Malta** will allow remote work for civil servants throughout the Maltese islands. **Italy** plans to upgrade 38 railway stations.

2.4.5. C26 - Improve conditions and the attractiveness of working in transport sector

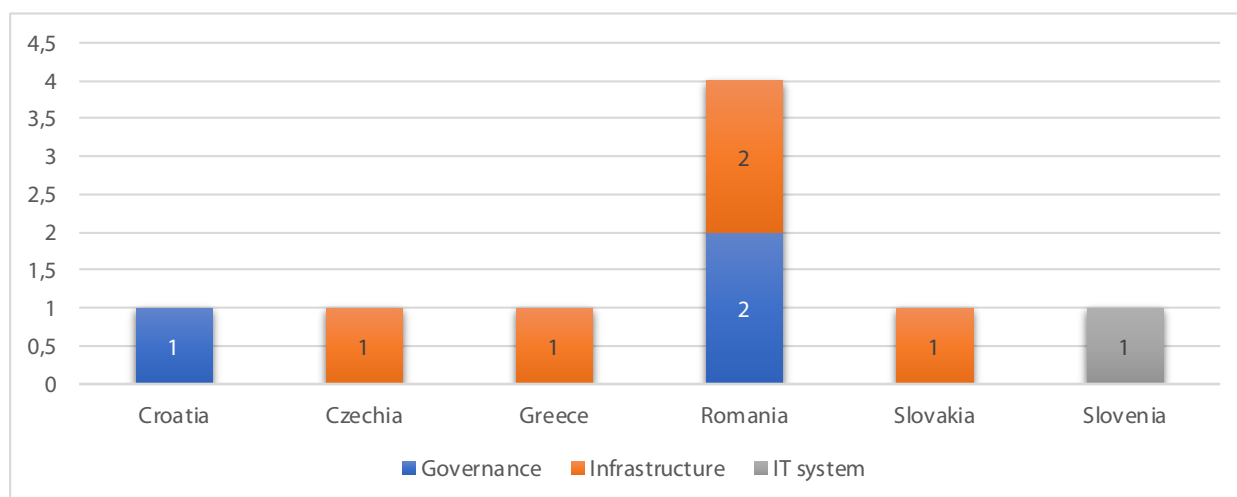
No measures have been identified around improving working conditions and the attractiveness of working in the transport sector.

2.4.6. C27 – Improve gender equality

Gender equality measures typically ensure equal opportunities for all genders working in the transport sector. However, no measures have been identified in the NRRPs, despite the fact that the topic is important for Member States. Instead, gender equality has been addressed through Member States' national plans, but is not separately highlighted in the approved NRRPs.

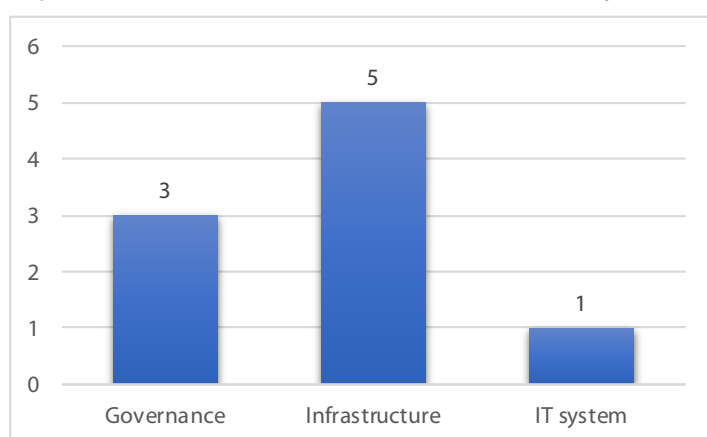
2.4.7. C28 – Improve road safety and security

Road safety and security includes protecting lives and property through regulation, management, and technology development in the road transport sector. In total, nine measures are planned by six Member States, including five on infrastructure, three on governance and one on IT systems measures (see figure 43).

Figure 43. Number of measures in C28 per Member state and category

Data source: Own elaboration

Figure 44 below shows the total number of measures per category.

Figure 44. Number of measures in C28 per Project category

Data source: Own elaboration

Examples of measures are provided in the box below.

Croatia is planning a reform of the road sector. The improvement of road and rail safety is being addressed in the **Czech Republic**. **Greece** aims to improve road safety. **Romania** is introducing 1,000 speed test systems, 300 mobile radars and 500 cameras to improve road safety. **Slovakia** is automating processes to detect traffic offenses. **Slovenia** is planning for 70 km of roads to be covered by a traffic control and management system.

Safety and security is not sufficiently addressed in the NRRPs, despite the fact that road safety is a significant challenge for several Member States and the EU's target is zero fatalities by 2050.

2.4.8. C29 - Improve safety and security of other modes of transport

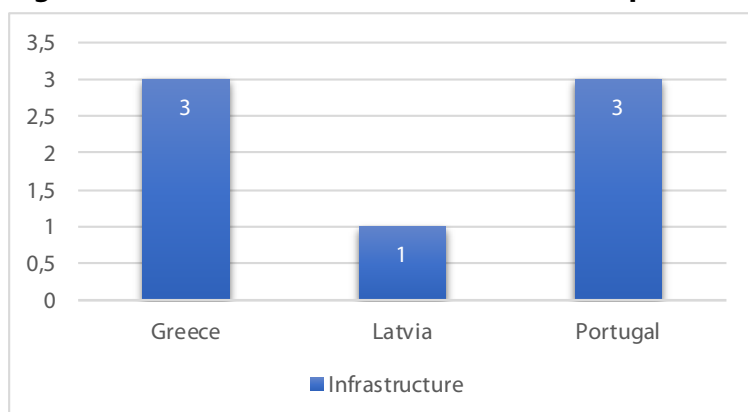
The improvement of safety and security of other modes of transport includes the protection of lives and property through regulating, managing and digitalising other forms of transportation, however, is only being addressed by one Member State.

The **Czech Republic**, is planning a measure to modernise eight railway structures, complete 291 level crossings with increased safety and construct 85 km of cycle paths, sidewalks and barrier-free roads.

2.4.9. C30 – Other priorities

Other priorities include measures that were not directly linked to the 29 EU transport sector priorities, i.e. seven measures and all are related to infrastructure (see figure 45 below).

Figure 45. Number of measures in C30 criterion per Member State



Data source: Own elaboration

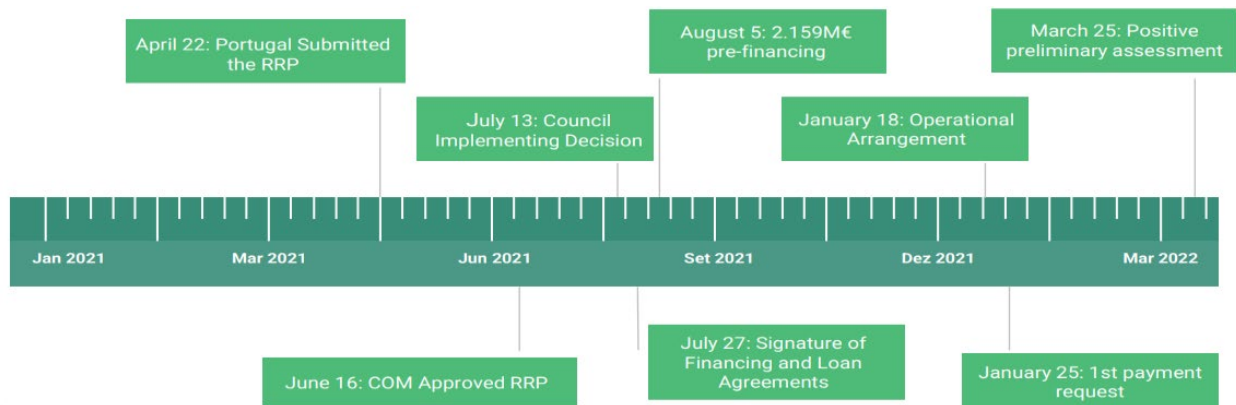
Greece is undertaking construction to modernise and improve the resilience of key sectors of the economy. **Latvia** is planning the improvement of the regional and local road networks. **Portugal** is planning to build 76.38 km of road.

2.5. Case studies on the implementation of the NRRPs

This chapter discusses three interesting case studies, showing the choices made by the Member States in terms of the chosen priorities and the coherence of NRRPs. The first case study focuses on Portugal, who developed the first NRPP. The second focuses on France, an interesting case of a country that already has good transport infrastructure despite limited funds provided by RRF, relative to the size of the country. The final case study focuses on Belgium who, as a federal country with transport competences spread among three Regions and the Federal State, provides us with a good example of how to balance differences in priorities within a Member State.

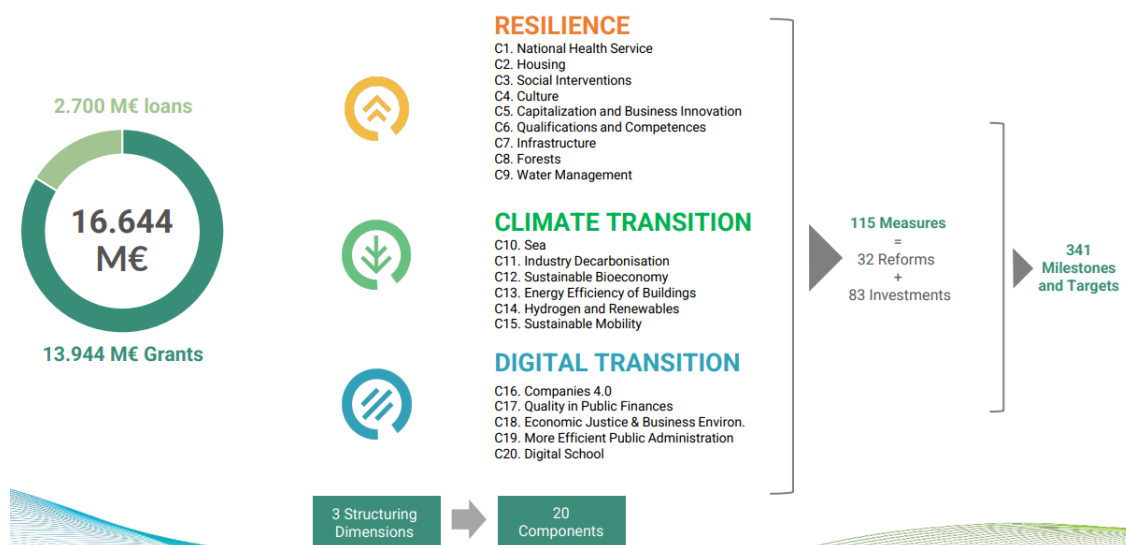
2.5.1. Overview of the implementation of the NRRP in Portugal

The RRP of **Portugal** was submitted on 22 April 2021, being the first plan to get the Commission's approval on 16 June 2021 (see the timeline in figure 46 below). The first payment request was submitted on 25 January 2022.

Figure 46. NRRP Portugal time scale

Data source: <https://recuperarportugal.gov.pt/wp-content/uploads/2022/04/First-Payment-Request-EN.pdf>

The RRP foresees EUR 16.6 million in non-repayable support and loans, distributed among 115 measures (combination of reforms and investments) and 341 milestones and targets. It is organised into 20 components, concentrated on the three main structural areas. The biggest share (67%) is dedicated to resilience, followed by climate transition (18%) and digital transition (15%).

Figure 47. RRP Portugal

Data source: <https://recuperarportugal.gov.pt/wp-content/uploads/2022/04/First-Payment-Request-EN.pdf>

From the 20 components, one (C15) is fully dedicated to sustainable mobility and two others (C7, C14) that also consider transport related aspects, focusing on infrastructure and hydrogen and renewables, respectively.

The C7. Infrastructure component (4% of the total RRP budget) addresses electric charging network (not supported via RRF), road missing links and capacity increase, cross border connections, road access to industrial areas and logistic parks. The focus is to improve road traffic management by constructing missing links that will better connect the national network and improve competitiveness.

The C14. Hydrogen and renewables (2% of the RRP budget) considers a reform of the National strategy for Hydrogen and investments in hydrogen and renewable gases, renewable electricity in Madeira Island and energy transition in Azores Island. The focus is to support the energy transition through the support to more sustainable energy sources such as hydrogen.

The C15. Sustainable mobility (6% of the RRP budget) also considers a reform of the transport ecosystem and investments on the expansion of the metro line in Lisbon and Oporto, a light rail in the outskirts of Lisbon connecting two areas within the metropolitan area, a BRT line near Oporto and decarbonisation of public transport. This component aims to support public transport in order to reach a reduction of private car usage in the two largest metropolitan areas of Lisbon and Oporto.

The [online communication portal](#) has information on all open calls and public tenders, from the present and past, providing a transparent monitoring of the RRP implementation. It is one good example of how to monitor and report the RRP implementation.

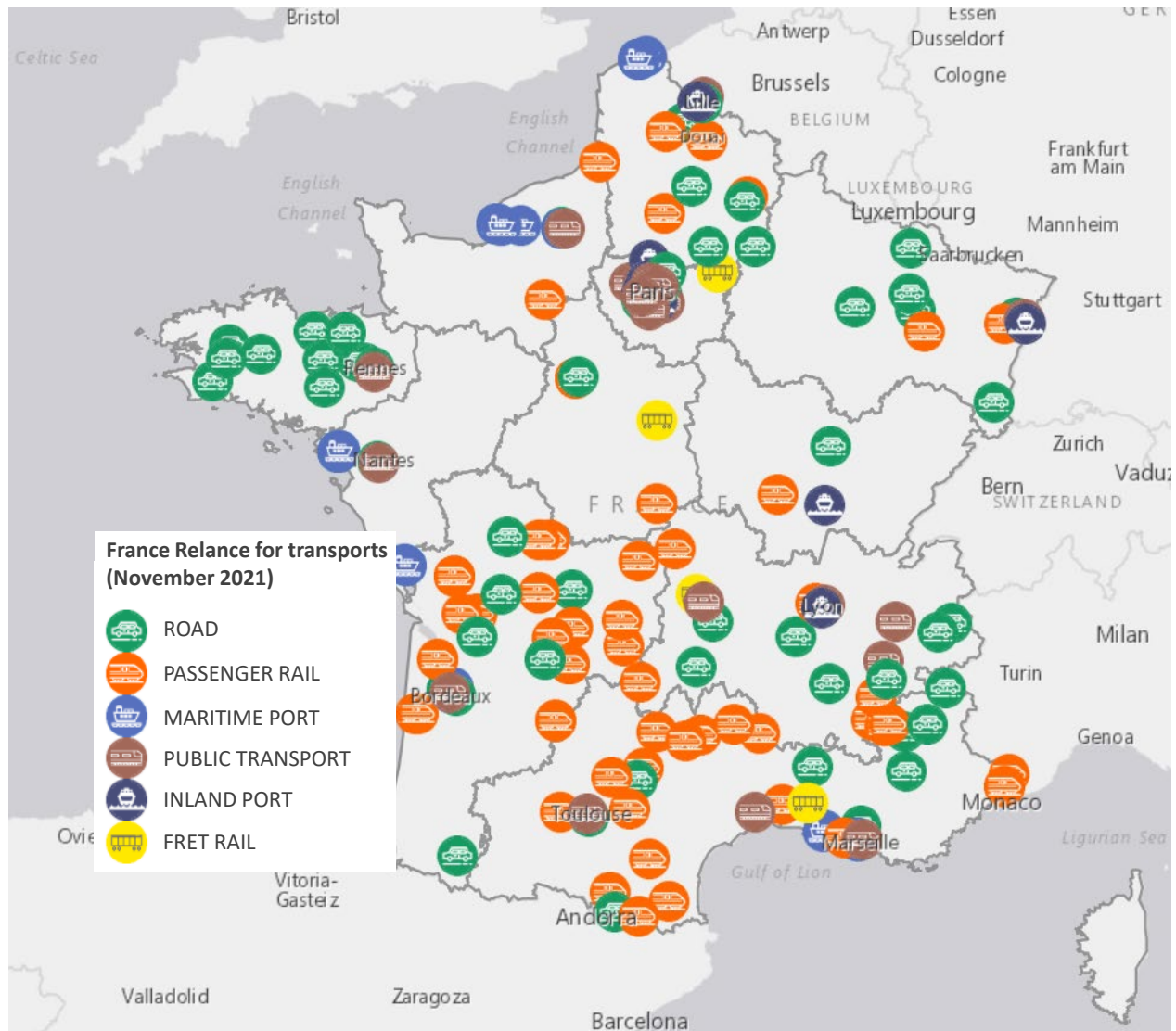
In contrast to the other Member States, Portugal presents a relatively large number of road-related projects. Port or rail related projects, on the other hand, are not part of Portugal's NRRP, with the exception of light rail projects for public transport in two Major Portuguese cities. Although investment in sustainable forms of transport is limited, Portugal does invest considerably in the sustainability of road transport through the roll-out of alternative fuel infrastructure. Another notable aspect is the absence of measures in the field of smart mobility in the Portuguese NRRP.

2.5.2. Overview of the implementation of the NRRP in France

France has combined the €40 billion from the RRF and €60 billion of national funds into a national recovery plan called "*France relance*". This plan was included into the [Finance Act for 2021 adopted by the National Assembly](#) on 15 December 2020. Monitoring the implementation of the NRRP falls under the responsibility of the National Recovery Monitoring Committee (*Comité national de suivi de la relance*) assisted by the *Secrétariat général France Relance*. The French Government extended the scope of an existing committee previously in charge of monitoring the implementation and evaluation of financial support measures for businesses affected by the Covid-19 pandemic. Call for proposals addressed to public and private entities on the different topics are published on [the Ministry of Economy's website](#).

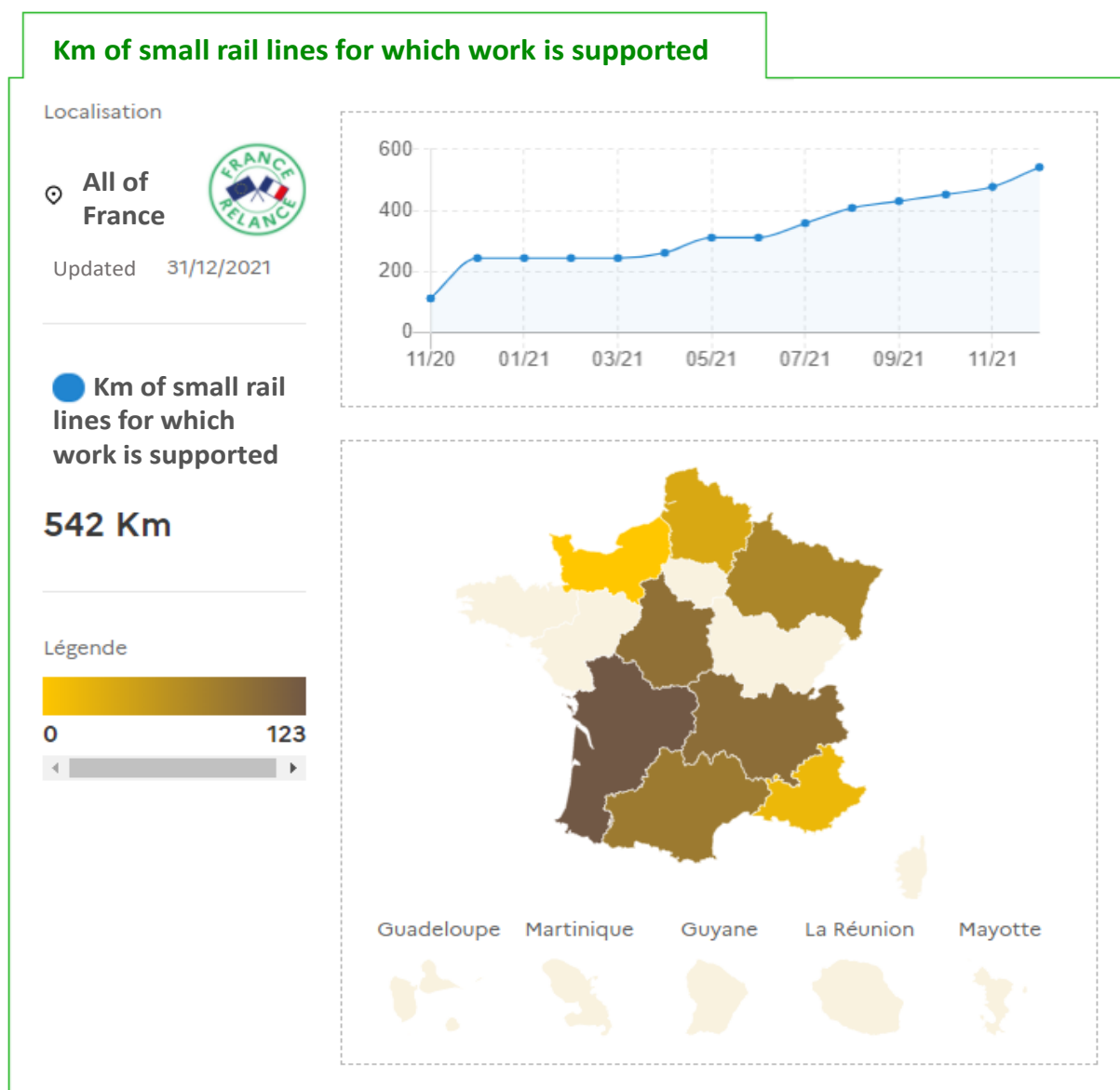
Measures are categorised in three categories: environment, competitiveness, and cohesion. Transport measures fall into the environment category. Figure 48 below displays transport measures in France by mode of transport.

Figure 48. France Relance for transports: infrastructure and green mobility



Data source: [France NRRP](#)

The implementation of most measures is presented by key indicators, as shown in figure 49 below for the [upgrade of small rail lines](#).

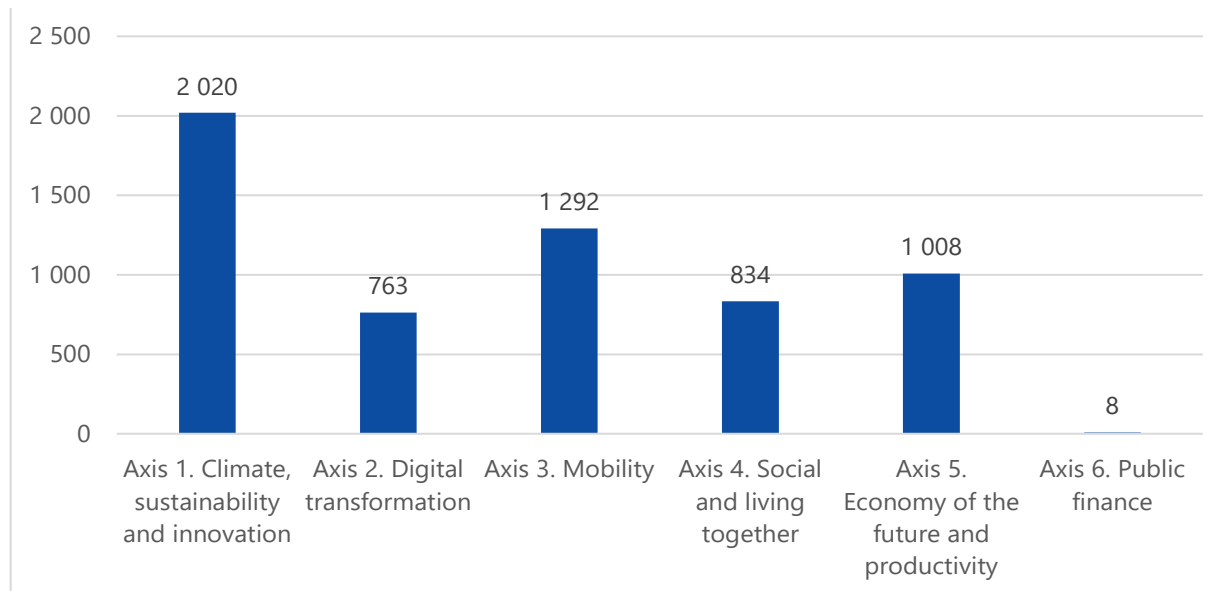
Figure 49. Key indicators on small rail line upgrades in France

Data source: [France NRRP](#)

Hence, the French government chose to focus its investments on infrastructure to improve everyday mobility, rather than larger intercity projects, such as high-speed rail lines. Funding provided to France by RRF was also largely supplemented with national funds which allowed for a more ambitious plan covering a wider number of small projects. The upside of this approach is a finer allocation of resources within the country and a potentially larger overall impact in terms of modal shift and reduction in CO₂ emissions. The downside is a less visible impact of NRRP, with no single project embodying the NRRP.

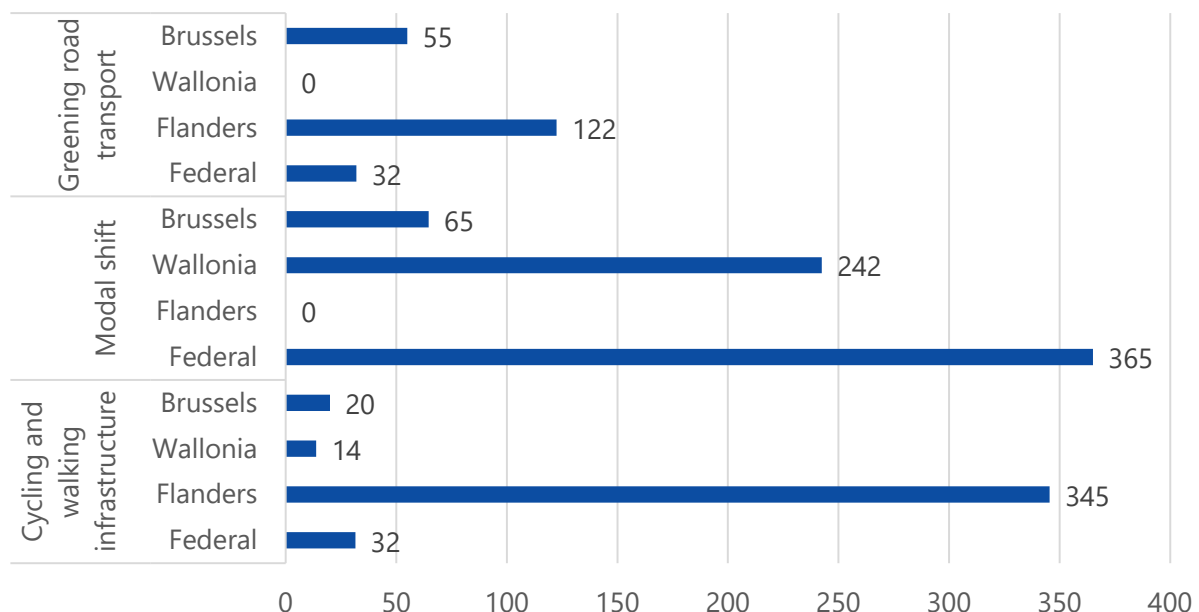
2.5.3. Overview of the implementation of the NRRP in Belgium

The Belgian Recovery and Resilience plan is structured along six axes, with mobility representing 22% of the total budget (see figure 50).

Figure 50. RRP Belgium budgeted, million EUR

Data source: Own elaboration

Due to the nature of governance in Belgium, measures were put forward by both the Federal government and by each of the three regions. While most mobility and transport competences are held by regions (roads, local public transport, inland waterways and airports), the Federal government is in charge of rail transport and was therefore the main promoter of the modal shift measures in terms of budget (see figure 51).

Figure 51. Investments in mobility by type and region, million EUR

Data source: Own elaboration

While active modes of transport (walking and cycling) and greening road transport were given priority by Flanders, Wallonia chose a different, and somewhat older, approach prizing mass transport rather than modal shift. The Brussels Region adopted a more balanced approach, with investments spread among all three categories. The Federal State's focus on modal shift reflects its competence in rail transport.

The different choices when it comes to active mobility reflect differences in geography. Flanders is more urbanised than Wallonia, but is likely to reinforce existing inequalities in cycling infrastructures between the North and the South of the country, which are reflected in widely different modal shares for biking.

3. NRRPs' CONTRIBUTION TO TEN-T CNC

KEY FINDINGS

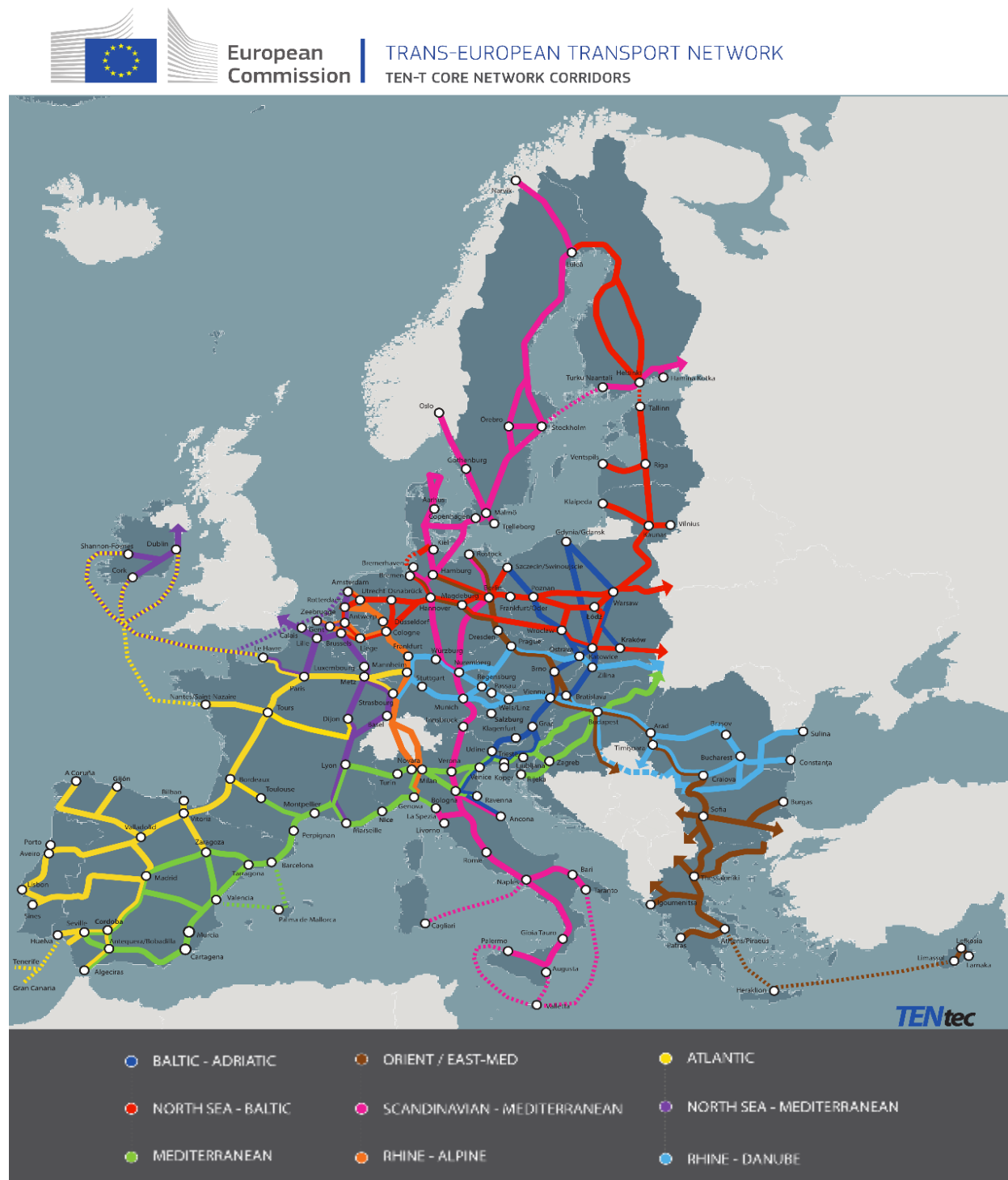
- NRRPs' contribution to the achievement of TEN-T policy objectives, and compliance of the Core Network Corridors (CNCs) with TEN-T requirements, varies between Member States and per transport mode. Member States with more mature transport infrastructure networks tend to focus on other priorities and are not using the RRF to further develop CNCs infrastructure.
- Rail was the main beneficiary of the NRRPs, with upgrades of existing rail infrastructure to increase compliance with TEN-T requirements in nine Member States, the construction of new compliant rail lines in four Member States, and the European Railway Traffic Management System (ERTMS) deployment in six Member States.
- Further deployment of alternative fuels for road transport will be the second major contributor of NRRPs regarding compliance increase in sixteen Member States, including measures to increase the number of electric charging stations and the planning of hydrogen stations in six Member States.
- The overall contribution of the NRRPs to CNC compliance with TEN-T requirements is moderate, as impacts in some countries will not be substantial and major benefits are expected mostly in Southern and Central Europe.

The chapter provides an overview of the extent to which the NRRPs' contributed to CNC development by looking at those measures which include TEN-T in the description, as well as measures where TEN-T is not mentioned but the project contributes to TEN-T development. This section starts with an assessment of all nine CNCs, thereafter each chapter focusing on a specific CNC.

3.1. TEN-T CNC

The nine TEN-T CNC defined by [Regulation \(EU\) 1316/2013](#), and with new CNCs alignment defined by [Regulation \(EU\) 2021/1153](#), make an important contribution to social, economic and territorial cohesion in the EU. Moreover, the development of CNCs will also help remove gaps, bottlenecks and technical barriers in the transport sector. The map of the nine TEN-T CNCs is provided in figure 52 below.

Figure 52. Map of the nine TEN-T Core Network Corridors



Data source: The European Commission

3.2. Baltic-Adriatic (BAC) Corridor

Figure 53. Alignment of the Baltic – Adriatic Corridor



Data source: [TENtec online database](#)

The BAC corridor consists of 4,200 km of rail and 3,600 km of road infrastructure from Poland to the North of Italy, crossing the Czech Republic, the Slovak Republic, Austria and Slovenia. It includes 10 ports, 14 airports and 20 RRTs.

Among countries on the BAC corridor, only the Polish NRRP has not yet been approved.

Rail

The key BAC corridor challenges for rail infrastructure are mostly related to train length, line speed, and ERTMS implementation. Compliance with the other TEN-T requirements (such as electrification, or axle load) is high. As of the end of 2019, ERTMS was operating on only 22% of the BAC corridor, mainly in Slovenia (90%) and the Slovak Republic (65%), compared to 0% in Italy and less than 20% for the other Member States.

Table 6. Key performance indicators for rail on the Baltic – Adriatic corridor

Rail key performance indicator (KPI)	2019
Electrification	99%
Track gauge 1435mm	100%
ERTMS implementation	22%
Line speed (≥ 100km/h)	71%
Axle load (≥ 22.5t)	94%
Train length (740m)	49%

Data source: Adapted from *"Fourth Work Plan of the European Coordinator on the Baltic Adriatic Corridor, P.7, June 2020"*

Eight investment measures of the NRRPs in five Member States will contribute to the achievement of compliance with TEN-T requirements by increasing the BAC's corridor KPIs on ERTMS, line speed, electrification, train length and axle load.

ERTMS benefits the most from the NRRP plans, with four measures contributing to ERTMS deployment in Italy, the Czech Republic, and Slovenia. The Czech Republic plans the completion of six additional projects (8 in total with ERTMS projects) from the predefined set of projects of 41 km of lines covered by the Global System for Mobile Communications – Railway (GSM-R), 20 newly installed or more reliably powered base transceiver stations (BTS) and the implementation of new technologies and equipment for railway traffic management (investment 1: Application of modern technologies to railway

infrastructure). The Czech Republic also aims at the completion of enhanced 5G signal coverage of selected rail corridors to pave the way for FRMCS - Future Railway Mobile Communication System (C 1.3: High Capacity Digital Networks - Investment 2: Covering 5G corridors and promoting the development of 5G).

Other measures relate to the upgrade of lines in Slovenia (C: Increasing railway infrastructure capacity) and the Slovak Republic (3 - Sustainable transport- Investment 1: Development of low-carbon transport infrastructure) to improve speed, electrification, axle load or train length allowed on key lines, which are also issues identified by KPIs. Construction of the Koralmbahn between Graz and Klagenfurt in Austria (Investment: 1.B.5.) will provide the BAC corridor with a new compliant rail link and will therefore increase KPI values.

Road

Roads along the BAC corridor are 86% of express road/motorway. Information on alternative clean fuels is not available for roads on the BAC corridor.

Table 7. Key performance indicator for road on the Baltic – Adriatic corridor

Road key performance indicator (KPI)	2019
Express road/ motorway	86%
Availability of alternative clean fuels	n.a,

Data source: Adapted from "[Fourth Work Plan of the European Coordinator on the Baltic Adriatic Corridor, P.7, June 2020](#)"

Five measures of the NRRPs, two in the Slovak Republic, one in Slovenia and two in Italy, were identified which will contribute to the deployment of alternative clean fuels along roads of the BAC corridor - both in terms of electric charging stations and hydrogen refuelling stations. For instance, Slovenia put forward a measure to promote the deployment of alternative clean fuels infrastructure in transport, with the aim of 482 operational recharging points accessible to the public for electric vehicles by 2025 (Investment E.), whereas the Slovak Republic plans to introduce a financial mechanism of aid schemes for the construction of recharging points for electric cars and hydrogen refuelling points (Investment 4).

No measure increasing the share of express road/motorways has been identified among the NRRPs.

Airports

Airports on the BAC corridor are all connected to rail and offer open access, but so far none of them provide alternative clean fuels. No NRRPs measure improving airport KPIs on the BAC could be identified.

Table 8. Key performance indicator for airports on the Baltic – Adriatic corridor

Airport key performance indicator (KPI)	2019
Connection to rail by 2050 (Warsaw, Wien)	100%
Open accessibility to at least one terminal *	100%
Availability of alternative clean fuels	0%

Data source: Adapted from "[Fourth Work Plan of the European Coordinator on the Baltic Adriatic Corridor, P.7, June 2020](#)"

Seaports

CNC seaports are largely compliant with the TEN-T requirements, except when it comes to the availability of alternative clean fuels (0%) and facilities for ship-generated waste (63%).

Table 9. Key performance indicator for seaports on the Baltic – Adriatic corridor

Key performance indicator (KPI)	2019
Connection to rail	100%
Connection to IWW CEMT IV (5 Seaports connected to IWW)	100%
Availability of alternative clean fuels	0%
Open accessibility to at least one terminal *	100%
Facilities for ship-generated waste	63%

Data source: Adapted from "[Fourth Work Plan of the European Coordinator on the Baltic Adriatic Corridor, P.7, June 2020](#)"

One Italian measure (E. Investment 4.3) will contribute to the deployment of alternative clean fuels in seaports, although this measure does not seem to include alternative clean fuel solutions for ships.

Inland ports

Inland ports achieve full compliance with TEN-T requirements, except for the availability of alternative clean fuels. No NRRPs measures are aimed at improving inland ports' KPIs on the BAC corridor.

Table 10. IWW ports key performance indicator on the Baltic – Adriatic corridor

Key performance indicator (KPI)	2019
Class IV waterway connection	100%
Connection to rail	100%
Availability of alternative clean fuels	0%
Open accessibility to at least one terminal *	100%

Data source: Adapted from "[Fourth Work Plan of the European Coordinator on the Baltic Adriatic Corridor, P.7, June 2020](#)"

Rail-road terminals

Most RRTs along the BAC corridor remain too short for 740-meter-long (740m) trains and some are not electrified nor offer open access. No NRRP measures aimed at improving RRT KPIs on the BAC corridor could be identified.

Table 11. RRT key performance indicator on the Baltic – Adriatic corridor

Key performance indicator (KPI)	2019
Capability for Intermodal (unitised) transshipment	100%
740m train terminal accessibility	33%
Electrified train terminal accessibility	75%
Open accessibility to at least one terminal *	83%

Data source: Adapted from "[Fourth Work Plan of the European Coordinator on the Baltic Adriatic Corridor, P.7, June 2020](#)"

Conclusions for the BAC corridor

Among the five NRRPs assessed, twelve measures will contribute to the KPIs of the BAC corridor. The rail network is the main beneficiary of NRRPs with a newly compliant line in Austria, infrastructure upgrades in Slovenia and the Slovak Republic, and acceleration of ERTMS deployment in Italy, the Slovak Republic, Slovenia and the Czech Republic. Those investments address the main issues facing the corridor. While some contributions have been made to the supply and use of alternative clean fuels on roads along the BAC corridor, with deployment of charging stations planned in the Slovak Republic, Slovenia and Italy, these are insufficient to achieve the targets regarding the availability of clean fuels. There is no direct impact of NRRPs measures on compliance with TEN-T requirements for airports, inland ports, and RRTs, whereas contribution for seaports' compliance will be minimal.

Overall, the contribution of NRRPs on compliance is not expected to be substantial. As the Polish NRRP has not yet been accepted, the ultimate contribution of NRRPs to TEN-T policy objectives could be larger.

3.3. The North Sea-Baltic (NSB) Corridor

Until 2021, the NSB corridor included 5,986 km of railways, 4,092 km of roads and 2,186 km of IWWs, as well as 28 ports, 26 airports, and 21 RRTs. Member States on the NSB Corridor were Finland, Estonia, Latvia, Lithuania, Poland, Germany, The Netherlands and Belgium.

In 2021, Regulation (EU) 2021/1153 redefined the alignment of the NSB corridor northwards across Finland up to Luleå in Northern Sweden and extended the NSB corridor in Eastern Germany and Southern Poland.

KPIs included in 4th Work Plan on the former NSB corridor alignment and therefore do not include extensions to Finland, Sweden, Germany, and Poland.

NRRP of The Netherlands has finally been submitted on 29 March 2022 but has not been accepted yet.

Figure 54. Alignment of the North Sea-Baltic corridor



Data source: [TENtec online database](#)

The main issues faced by the NSB corridor are rail infrastructure in the East, with track gauge not compliant in the Baltics and Finland.

Rail

Compliance is relatively high for railways across almost all TEN-T parameters, except for ERTMS deployment which remains low (8%). As of 2019, no ERTMS signalling was implemented in the Baltic States and in Germany (KPI at 0% or 1%), as opposed to Belgium and The Netherlands (respectively 56% and 40%). It should be noted that the Baltic States are isolated networks. Other priorities relate to the need to increase electrification and line speed along the NSB corridor.

Table 12. Key performance indicator for rail on the North Sea-Baltic corridor

Key performance indicator (KPI)	BE	NL	DE	PL	LT	LV	EE	FI	Corridor
Electrification	100%	100%	97%	91%	18%	11%	17%	100%	75%
Track gauge (1,435mm)	100%	100%	100%	100%	13%	0%	0%	0%	76%
line speed >=100km/h	87%	100%	100%	79%	88%	0%	100%	N/A	93%
Axle load freight 22.5t	100%	100%	100%	99%	100%	100%	100%	N/A	100%
Train length freight min 740m	100%	100%	100%	51%	100%	100%	100%	N/A	88%
ERTMS signalling	56%	40%	0%	1%	0%	0%	0%	0%	8%

Data source: Adapted from "[Fourth Work Plan of the European Coordinator on the North Sea Baltic Corridor](#), P.9, June 2020"

Six measures among the NRRPs will improve rail infrastructure KPIs. Two of these measures will contribute to ERTMS deployment on the NSB corridor. In Finland, ERTMS will be deployed by mid-2026 on commercial pilot tracks as single train control system with the goal of full ERTMS deployment on

the entire Finish network by 2040 (Investment 2 - P2C1I2). In Lithuania, 5G services along railway lines (such as Rail Baltica) will prepare for FRMCS deployment (C.1.5.1.).

In Estonia, two new rail infrastructure projects will be put forward, including a section of the westbound Tallinn-Rohuküla railway (5.2 Investment) and the Rail Baltic multimodal joint terminal in Tallinn (5.3. Investment).

Road

Roads along the NSB corridor achieve 73% of express road/motorway status among corridor roads and with full compliance regarding the availability of alternative clean fuels.

Table 13. Key performance indicators for road on the North Sea-Baltic corridor by country

Key performance indicator	BE	NL	DE	PL	LT	LV	EE	FI	Corridor
Express road/ motorway	100%	100%	100%	59%	65%	8%	14%	100%	73%
Availability of alternative clean fuel	100%	100%	100%	100%	100%	100%	100%	100%	100%

Data source: Adapted from *"Fourth Work Plan of the European Coordinator on the North Sea Baltic Corridor, P.9, June 2020"*

Six measures funded by NRRPs will contribute to the availability of alternative clean fuels by developing charging stations in five countries: Finland (measure D.P1C4I1), Latvia (measure 1.2.1.5.i.), Lithuania (measures B.1.2.3. and B.1.2.3.), Germany (measure 1.2.1.), and Belgium (measure I. Investment I-3F).

Inland waterways (IWW)

The IWW network is located in Belgium, The Netherlands and Germany and largely complies with TEN-T requirements, with only some bridge height issues in Germany.

Table 14. Key performance indicator for IWW on the North Sea-Baltic corridor by country

Airport key performance indicator	BE	NL	DE	PL	LT	LV	EE	FI	Corridor
CEMT Class (Class IV)	100%	100%	100%	N/A	N/A	N/A	N/A	N/A	100%
Minimum draught (from 2.5m)	100%	100%	100%	N/A	N/A	N/A	N/A	N/A	100%
Minimum height under bridges (from 5.25 m)	100%	100%	85%	N/A	N/A	N/A	N/A	N/A	93%
Availability of alternative clean fuels by 2030	100%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Data source: Adapted from *"Fourth Work Plan of the European Coordinator on the North Sea Baltic Corridor, P.9, June 2020"*

One measure in Belgium (H. Investment I-3.11) will upgrade the existing IWW above the TEN-T requirement of minimum height under-bridges, by increasing the height of four bridges above the Albert-Canal to allow barges transporting freight of up to 9.1m of height and carrying four layers of containers.

Airports

Airports on the NSB corridor are all connected to rail, except Riga International Airport. However, none so far provide alternative clean fuels. No NRRPs measure improving airport KPIs on the NSB corridor could be identified.

Table 15. Key performance indicator for airports on the North Sea-Baltic corridor

Key performance indicator	BE	NL	DE	PL	LT	LV	EE	FI	Corridor
Connection to rail by 2050	100%	100%	100%	100%	100%	100%	100%	100%	88%
Availability of alternative clean fuels	0%	0%	0%	0%	0%	0%	0%	0%	0%

Data source: Adapted from *"Fourth Work Plan of the European Coordinator on the North Sea Baltic Corridor, P.9, June 2020"*

Seaports

The NSB corridor seaports are all expected to be connected to rail by 2030 and alternative clean fuels to be available by 2025. By 2030, full compliance to Regulation (EU) 1315/2013 is expected on the NSB corridor, except for Latvia which will not yet be aligned regarding alternative clean fuels. No NRRPs measure improving seaports KPIs on the NSB corridor could be identified.

Table 16. Key performance indicator for seaports on the North Sea-Baltic corridor

Key performance indicator (KPI)	BE	NL	DE	PL	LT	LV	EE	FI	Corridor
Connection to rail and IWW by 2030	100%	100%	100%	N/A	100%	100%	100%	100%	100%
Availability of alternative clean fuels	100%	100%	100%	N/A	100%	0%	100%	100%	83%

Data source: Adapted from "[Fourth Work Plan of the European Coordinator on the North Sea Baltic Corridor, P.9, June 2020](#)"

Inland ports

Inland ports achieve full compliance with TEN-T requirements, except for accessibility to alternative clean fuels. However, this is expected to achieve 15% compliance by 2025. At the country level, only Belgium is expected to offer full access to alternative clean fuels. The Netherlands is expected to reach one third of availability. No NRRPs measure improving inland ports KPIs on the NSB corridor could be identified.

Table 17. Key performance indicator for inland ports on the North Sea-Baltic corridor by country

Airport key performance indicator (KPI)	BE	NL	DE	PL	LT	LV	EE	FI	Corridor
Class IV waterway connection	100%	100%	100%	N/A	N/A	N/A	N/A	N/A	100%
Connection to rail	100%	100%	100%	N/A	N/A	N/A	N/A	N/A	100%
Availability of alternative clean fuels	100%	33%	0%	N/A	N/A	N/A	N/A	N/A	15%
Availability to at least freight terminal	100%	100%	100%	N/A	N/A	N/A	N/A	N/A	100%

Data source: Adapted from "[Fourth Work Plan of the European Coordinator on the North Sea Baltic Corridor, P.9, June 2020](#)"

Rail-road terminals

No RRT KPIs are presented in the NSB corridor 4th Work Plan and no NRRPs measure improving RRT KPIs on the NSB corridor could be identified.

Conclusions for the NSB corridor

The main contributions of NRRPs on the NSB corridor will be for rail, by accelerating ERTMS deployment in Finland and 5G deployment in Lithuania, and further network development in Estonia and Latvia. Those investment partly address the main issues facing the corridor.

NRRPs will also contribute to the further deployment of alternative clean fuels for road transport to respond to future needs, although the NSB corridor's roads are already compliant in this regard.

In Belgium, Region Wallonia will upgrade existing IWW above the minimum TEN-T requirement of height under bridges on the Albert Canal.

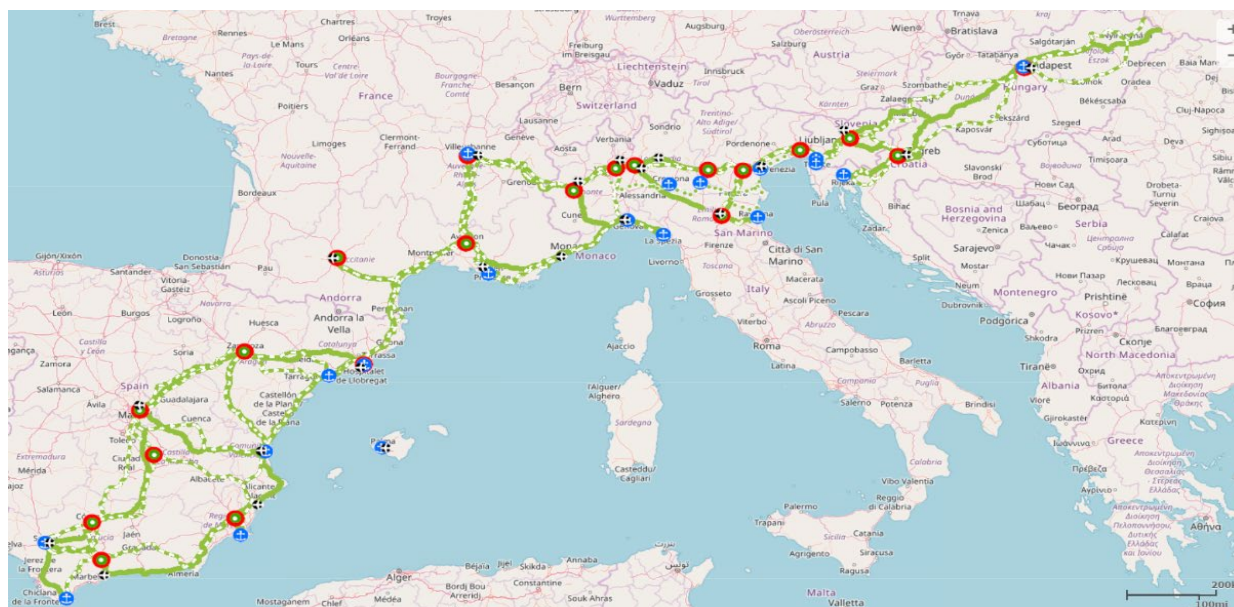
No measures were identified regarding airports, seaports, inland ports or RRTs compliance with TEN-T requirements.

Hence, the overall impact of NRRPs on the NSB corridor compliance is not expected to be substantial.

3.4. The Mediterranean (MED) Corridor

The MED corridor stretches from Southern Spain to Hungary through Southern France, Northern Italy, Slovenia, and Croatia. It includes 5,700 km of roads, 12 maritime ports, 9 inland ports, 17 airports, and 19 RRTs. NRRPs of the MED Corridor have been accepted, except for Hungary. The main issue facing the corridor is rail track gauge on the Iberian Peninsula.

Figure 55. Alignment of the Mediterranean Corridor



Data Source: [TENtec online database](#)

Rail

The MED corridor faces several challenges of rail compliance to TEN-T requirements. Among the main issues are track gauge and electrification in Spain, train length in all countries, and ERTMS deployment in all countries except Slovenia.

Table 18. Key performance indicator for rail on the Mediterranean corridor by country

key performance indicator	ES	FR	IT	SI	HR	HU	Corridor
Electrification	79%	100%	100%	100%	100%	100%	90%
Track gauge (1,435mm)	39%	100%	100%	100%	100%	100%	72%
Line speed $\geq 100\text{km/h}$	100%	97%	78%	71%	75%	99%	95%
Axle load freight 22.5t	100%	100%	100%	99%	100%	37%	92%
Train length freight min 740m	3%	78%	0%	70%	0%	39%	20%
ERTMS signalling	25%	2%	8%	100%	0%	0%	16%

Data source: Adapted from *"Fourth Work Plan of the European Coordinator on the Mediterranean Corridor, P.10, August 2020"*

Several NRRP measures will contribute to the improvement of the MED corridor KPIs. Spain plans to finance large investments on TEN-T rail network on the MED corridor (F.Investment 1 (C6.I1)), with at least EUR 1.4 billion allocated to CNCs developments, targeted towards electrification, change of tracks and deployment of ERTMS. On the MED corridor there are nine Spanish rail lines and those investments are thus expected to significantly improve compliance with TEN-T requirements. Croatia plans to upgrade parts of its rail network by upgrading lines Dugo Selo – Novska and Zagreb Kustošija – Zagreb ZK – Zagreb GK to electrify double track (Investment C1.4 R2-I4). In Italy, high speed lines are planned on the MED corridor (Brescia - Verona, Verona – Vicenza and Vicenza – Padova) and there is one measure to introduce high-speed lines in the North connecting to the rest of Europe (H. Investment 1.2).

Road

Roads along the MED corridor achieve 90% of express road/motorway. Information on alternative clean fuels is not available for the MED corridor.

Table 19. Key performance indicator for road on the Mediterranean corridor

key performance indicator (KPI)	ES	FR	IT	SI	HR	HU	Corridor
Express road/ motorway	100%	100%	100%	100%	100%	97%	90%

Data source: Adapted from *"Fourth Work Plan of the European Coordinator on the Mediterranean Corridor, P.10, August 2020"*

All NRRPs include measures to deploy alternative clean fuels on the road networks of several Member States. Italy plans to deploy charging stations on motorways (E. Investment 4.3). France plans to accelerate work on transport infrastructure, with 1,500 charging stations to be deployed by the end of 2023 (Investment 4 (C3.I4)). Croatia aims to build at least six hydrogen charging stations for cars, buses and heavy-duty vehicles (Investment C1.2.R1-I3). Spain (A.Investment 2 (C1.I2)) and Slovenia (D. Investment E.) also put forward measures to promote the deployment of alternative clean fuel infrastructure.

Inland waterways (IWW)

IWWs on the MED corridor are located in France (Rhône basin) and Italy (Po basin). They present a high degree of compliance, but with some room for further improvement on all indicators.

Table 20. Key performance indicator for IWW on the Mediterranean corridor

Key performance indicator (KPI)	ES	FR	IT	SI	HR	HU	Corridor
CEMT Class (Class IV)	N/A	100%	80%	N/A	N/A	N/A	88%
Minimum draught (from 2.5m)	N/A	63%	70%	N/A	N/A	N/A	67%
Minimum height under bridges (from 5.25 m)	N/A	96%	62%	N/A	N/A	N/A	75%
River information system	N/A	77%	80%	N/A	N/A	N/A	75%

Data source: Adapted from *"Fourth Work Plan of the European Coordinator on the Mediterranean Corridor, P.10, August 2020"*

France plans to accelerate renovation and modernisation of its waterways with 100 projects, such as locks and dams, all included under one measure (Investment 4 (C3.I4)). Information on location of those projects is not provided and it could not be assessed whether some of them will take place on the River Rhône.

Airports

Among the 17 airports on the MED corridor, only Lyon airport in France is fully compliant regarding rail connection. No NRRPs measure improving airport KPIs on the MED corridor could be identified.

Seaports

The MED corridor's ports are fully compliant to the requirement of being connected to railways. Other KPIs are not presented.

Table 21. Key performance indicator for seaports on the Mediterranean corridor

key performance indicator	ES	FR	IT	SI	HR	HU	Corridor
Rail connection	100%	100%	100%	100%	100%	100%	100%

Data source: Adapted from *"Fourth Work Plan of the European Coordinator on the Mediterranean Corridor, P.10, August 2020"*

Spain will use NRRPs to fund at least 19 projects of rail accessibility and projects of sustainability within 25 different ports, all those projects are included within one measure (C6.I3). The list of ports concerned by this measure is not provided, therefore it is not possible to assess measure impact on the MED corridor.

France aims at greening its ports by installing nine new electric connections to offer cold ironing to ships on docks, including for passenger ships and container ships using the docks in Marseille-Fos port (Investment 6 (C3.I6)). Although this is not a clean fuel solution per se, it allows ships to not have to rely on on-board generators to run electrical appliances when it docks.

The Italian plan includes a measure which will contribute to the deployment of alternative clean fuels in seaports (Investment 1.1), although this measure does not seem to include alternative clean fuel solutions for ships.

Inland ports

No KPI are presented in the 4th Work Plan regarding inland ports for the MED corridor. No NRRPs measure improving inland ports KPIs on the MED corridor could be identified.

Rail-road terminals (RRTs)

No KPI are presented in 4th Work Plan regarding RRTs. No NRRPs measure improving RRT on the MED corridor could be identified.

Conclusions for the MED corridor

From the analysis, it is clear that the NRRPs will contribute to increasing rail and road's compliance with the TEN-T requirements on the MED corridor. With regards to rail, the NRRPs will contribute to important upgrades of the rail network in Spain, Slovenia and Croatia. NRRPs will also finance construction of several new high-speed lines in Italy. Investments in Spain are addressing the main issue facing the corridor, which is the lack of UIC track gauge on the Iberian Peninsula. Regarding roads, all countries along the MED corridor for which NRRPs have been approved, intend to develop alternative clean fuel infrastructure on their road network.

With regards to the other transport modes, alternative clean fuel availability in seaports will be improved in France and Italy, however no measures were identified with regards to IWW, airports, inland ports, or RRTs.

NRRPs are expected to have a significant overall impact on the MED corridor in large part due to the numerous rail measures included.

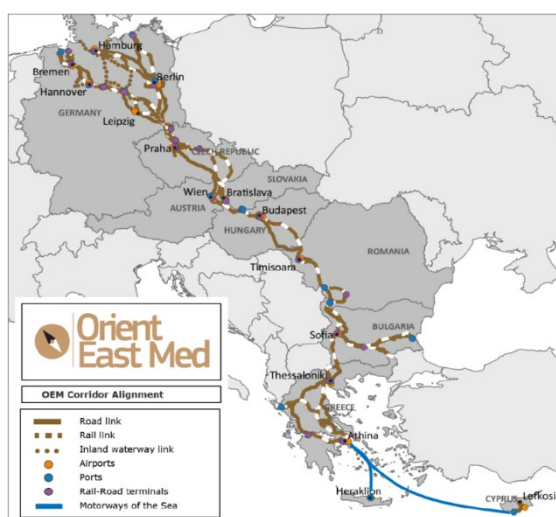
3.5. The Orient / East-Mediterranean (OEM) Corridor

The OEM corridor connects North-Western Germany to South-Eastern Europe by linking nine Member States: Germany, Austria, the Czech Republic, the Slovak Republic, Hungary, Romania, Bulgaria, Greece, and Cyprus.

The OEM corridor includes 15 urban nodes and airports, 10 inland ports, 12 seaports and 25 hubs with RRTs.

NRRPs of Hungary and Bulgaria have not yet been approved and therefore cannot be analysed.

Figure 56. Alignment of the Orient / East-Mediterranean Corridor



Data source: [OEM Corridor 4th Work Plan](#)

The main issue facing the corridor is the uncomplete motorway network in Romania and Bulgaria.

Rail

Overall compliance is quite high, except for train length, as large parts of the OEM corridor network does not allow freight trains with length above 740m. Electrification compliance is 89% across the whole OEM corridor with Greece presenting the lowest compliance on this criterion.

Table 22. Key performance indicator for rail on the Orient / East-Mediterranean corridor

Key performance indicator	AT	DE	CZ	SK	HU	RO	BG	EL	CY	Corridor
Electrification	100%	96%	100%	100%	100%	80%	100%	47%	N/A	89%
Line speed $\geq 100\text{km/h}$	100%	100%	96%	72%	97%	80%	43%	81%	N/A	81%
Axle load freight 22.5t	100%	100%	100%	100%	83%	6%	100%	67%	N/A	84%
Track gauge (1,435mm)	100%	100%	100%	100%	100%	100%	100%	100%	N/A	100%
Train length freight (740m)	0%	100%	0%	0%	97%	13%	11%	61%	N/A	49%

Data source: Adapted from "[Fourth Work Plan of the European Coordinator on the Orient East Med Corridor, P.11, May 2020](#)"

Eight rail measures from four different Member States are expected to improve KPIs. The Czech Republic (measure G. Investment 3), the Slovak Republic (measures 3. Investment 1 and 3. Investment 1) and Romania (measures 3. Investment 1 and Governance – 2) plan to modernise railway lines along TEN-T corridors with ERTMS deployment (Romania and the Czech Republic), but also various projects of electrification, as well as speed and capacity increases.

Greece aims to upgrade its main lines such as Central Greece Piraeus – Athens – Thessaloniki – Northern borders (Q. 17 - 4.6., measure ID 16954). Those investments include electrification and signalling, but ERTMS is not mentioned.

Road

Roads along the OEM corridor achieve 88% of express road/motorway compliance, with Romania presenting the lowest compliance rate (37%) on this KPI. On the availability of alternative clean fuels, compliance varies greatly along the OEM corridor, with Cyprus reaching only 21%.

Table 23. Key performance indicator for road on the Orient / East-Mediterranean corridor

Key performance indicator	AT	DE	CZ	SK	HU	RO	BG	EL	CY	Corridor
Express road/motorway	74%	100%	85%	100%	94%	37%	71%	100%	95%	88%
Availability of alternative clean fuels	100%	99%	100%	100%	88%	100%	100%	93%	21%	95%

Data source: Adapted from "[Fourth Work Plan of the European Coordinator on the Orient East Med Corridor, P.15, May 2020](#)"

Eight relevant road measures were identified on the OEM Corridor. Romania's NRRP includes large investments on its CNC roads with four new motorways to be built for a total of 429km. Those investments will greatly increase compliance with the express road/motorway requirement in Romania (currently at 37%).

Greece plans to carry out the construction of two new motorways on CNC: 70km of E65 motorway in Northern Greece between Trikala and Egnatia (Q. 17 - 4.6., measure ID 16628) as well as the Cretan Northern Highway (17 - 4.6., measure ID 16630).

Cyprus (Investment 2 (C2.2I2)), Greece (C.3 - 1.3.), Romania (D. Reform 1.), the Slovak Republic (3. Investment 4), and Germany (1.2.1.) presented measures to develop alternative clean fuel

infrastructure along the OEM corridor. Cyprus, for instance, aims to install 1,200 charging points by 2025 which should improve the availability of alternative clean fuels along the OEM corridor. However, the plan does not mention charging stations on motorways but it does for “public buildings, local authorities, small and medium-sized enterprises (SMEs) and/or private households”.

Inland waterways

Only Germany and the Czech Republic have IWWs on the OEM corridor. The main challenge comes from the minimum draught (2.5m) requirement which was met for half of the waterways in Germany but none in the Czech Republic. No NRRPs measure improving IWW KPIs on the OEM corridor could be identified.

Table 24. Key performance indicator for IWW on the Orient / East-Mediterranean corridor

Key performance indicator (KPI)	DE	CZ	Corridor
CEMT Class (Class IV)	100%	85%	100%
Minimum draught (from 2.5m)	51%	0%	40%
Fairway depth > 1.40 m	57%	90%	64%
Minimum height under bridges (from 5.25 m)	61%	72%	61%
RIS implementation	100%	100%	100%

Data source: Adapted from “[Fourth Work Plan of the European Coordinator on the Orient East Med Corridor, P.14, May 2020](#)”

Airports

Only three airports (Hamburg, Prague, and Budapest) have a rail connection and there is currently no access to alternative clean fuels. No NRRPs measure improving airport KPIs on the OEM corridor could be identified.

Table 25. Key performance indicator for airports on the Orient / East-Mediterranean corridor

Key performance indicator	AT	DE	CZ	SK	HU	RO	BG	EL	CY	Corridor
Rail connection	100%	80%	0%	0%	0%	0%	0%	33%	0%	46%
Alternative clean fuels	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Terminal availability	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Data source: Adapted from “[Fourth Work Plan of the European Coordinator on the Orient East Med Corridor, P.16, May 2020](#)”

Seaports

All the seaports are lacking accessibility to alternative clean fuels. However, it is expected that alternative clean fuels will be made available for one third of seaports on the OEM corridor by 2030. No NRRPs measure improving seaports' KPIs on the OEM corridor could be identified.

Table 26. Key performance indicator for seaports on the Orient / East-Mediterranean corridor

Key performance indicator (KPI)	AT	DE	CZ	SK	HU	RO	BG	EL	CY	Corridor
Rail connection	N/A	100%	N/A	N/A	N/A	N/A	100%	40%	0%	80%
Class IV waterway connection	N/A	100%	N/A	N/A	N/A	N/A	100%	100%	100%	100%
Availability of alternative clean fuels	N/A	0%	N/A	N/A	N/A	N/A	0%	0%	0%	0%
Open terminal *availability	N/A	100%	N/A	N/A	N/A	N/A	100%	100%	100%	100%
Waste facilities	N/A	100%	N/A	N/A	N/A	N/A	100%	100%	100%	100%

Data source: Adapted from "[Fourth Work Plan of the European Coordinator on the Orient East Med Corridor, P.15, May 2020](#)"

Inland ports

There is no access to alternative clean fuels, whereas compliance to other TEN-T requirements is relatively high. No NRRPs measure improving inland ports KPIs on the OEM corridor could be identified.

Table 27. Inland ports key performance indicator on the Orient / East-Mediterranean corridor

Key performance indicator (KPI)	DE	CZ	Corridor
Class IV waterway connection	100%	50%	80%
Connection to rail	100%	100%	100%
Availability of alternative clean fuels	0%	0%	0%
Open accessibility to at least one terminal	100%	50%	89%

Data source: Adapted from "[Fourth Work Plan of the European Coordinator on the Orient East Med Corridor, P.15, May 2020](#)"

Rail-road terminals

About two thirds of the terminals along the OEM corridor offer transshipment of all types of classical intermodal loading. However, half of the RRTs were not electrified or remain too short for 740m trains. No NRRPs measure improving RRT KPIs on the OEM corridor could be identified.

Table 28. RRT key performance indicator on the Orient / East-Mediterranean corridor

Key performance indicator (KPI)	AT	DE	CZ	SK	HU	RO	BG	EL	CY	Corridor
Intermodal transshipment	100%	70%	50%	0%	67%	0%	100%	100%	N/A	62%
740m train terminal accessibility	0%	30%	17%	0%	33%	0%	0%	50%*	N/A	29%
Electrified access	50%	40%	0%	0%	0%	0%	100%	50%	N/A	28%
Open accessibility to terminals	100%	100%	50%	100%	100%	0%	0%	100%	N/A	74%

Data source: Adapted from "[Fourth Work Plan of the European Coordinator on the Orient East Med Corridor, P.15, May 2020](#)"

Conclusions for the OEM corridor

The overall impact of NRRPs on the OEM corridor is significant. For Member States with approved NRRPs on the OEM corridor, NRRPs will positively impact the rail network in the Czech Republic, the Slovak Republic, Romania, and Greece by financing upgrades of existing non-compliant lines and by accelerating ERTMS deployment on the OEM corridor. The NRRP for Hungary has not yet been accepted and therefore could not be analysed.

Several new motorways in Romania and Greece will complement the existing road network and increase compliance with the express road/motorway criteria, which remains low in Romania. These investments address the main issue facing the corridor, although Bulgaria also lacks compliance regarding its motorways and the Bulgarian NRPP could not be analysed.

NRRPs will also enhance alternative clean fuel availability along the road network, including the installation of new charging stations in Cyprus, Greece, Romania, the Slovak Republic, the Czech Republic, and Germany.

No NRRP measures were identified regarding IWW, seaports, airports, inland ports or RRTs.

3.6. The Scandinavian – Mediterranean (SCAN-MED) Corridor

The SCAN-MED corridor is the longest of all CNCs, linking the Mediterranean (Italy, Malta) with Scandinavia (Norway, Denmark, Sweden and Finland) through Austria and Germany. The SCAN-MED corridor included 9,600 km of rail, 6,300 km of roads, together with 25 ports, 19 airports, and 28 RRTs.

Since the publication of the 4th Work Plan, the SCAN-MED corridor alignment has been extended northwards towards Narvik in Norway and Oulu in Finland.

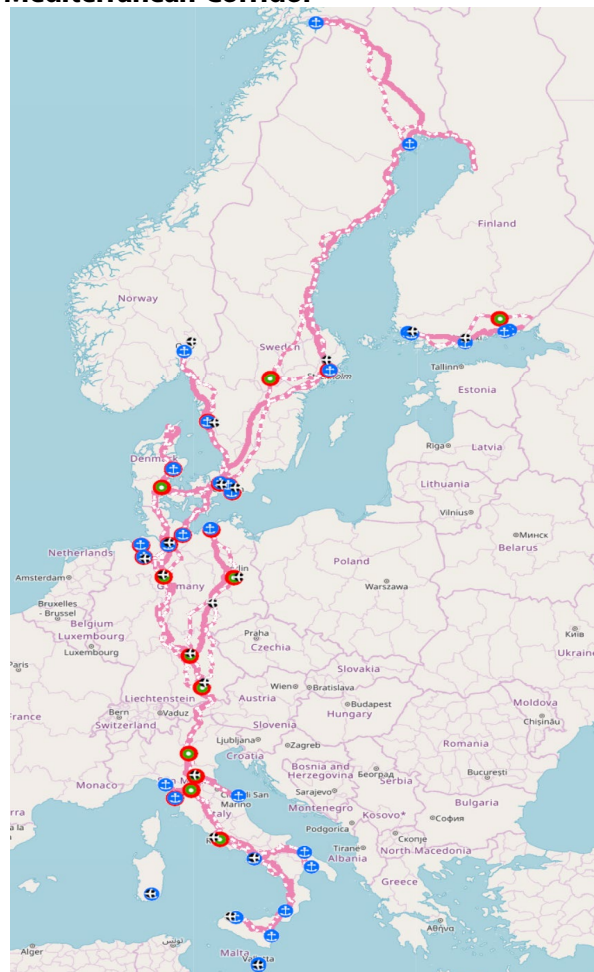
The 4th Work Plan presents the KPIs on SCAN-MED Corridor compliance with TEN-T requirements not including the new SCAN-MED Corridor sections.

The main issues facing the corridor include the lack of rail infrastructure for 740 m long freight trains and low ERTMS implementation.

Rail

Compliance is almost fully achieved along the SCAN-MED corridor for all TEN-T requirements except for train length and ERTMS deployment. Half of the railways on the SCAN-MED corridor were unable to receive 740 m freight trains.

Figure 57. Alignment of the Scandinavian – Mediterranean Corridor



Data source: [TENtec online database](#)

On ERTMS, while the GSM-R component is almost fully achieved, compliance to the ETCS component is very low (only on 7% of the SCAN-MED corridor). The lowest level of compliance is observed in Finland, Norway, Sweden and Germany for ERTMS signalling.

Table 29. Key performance indicator for rail on the Scandinavian – Mediterranean corridor

Rail key performance indicator	2018
Electrification	96%
Track gauge 1435mm	100%
Axle load ($\geq 22.5t$)	92%
Line speed ($\geq 100km/h$)	92%
ERTMS implementation	7%
Train length (740m)	49%

Data source: Adapted from "[Fourth Work Plan of the European Coordinator on the Scandinavian Mediterranean Corridor, P.14, September 2020](#)"

Italy includes in its NRRP some major rail infrastructure investments on the SCAN-MED corridor, including new compliant high-speed lines Verona – Brennero in the North, Napoli – Bari in the South, as well as between Palermo – Catania in Sicily (Investment 1.1, M3C1-3). Other Italian rail investments

include upgrades and electrification of Southern railways (Investment 1.7, M3C1-17), although the impact on the SCAN-MED corridor KPIs could not be fully assessed based on the information provided. Finland (Investment 2, P2C1I2) and Italy (H. Investment 1.4) are also funding ERMTS deployment on their rail networks.

Road

Most roads on the SCAN-MED corridor already meet TEN-T requirements.

Table 30. Key performance indicator for road on the Scandinavian – Mediterranean corridor

Road key performance indicator (KPI)	2018
Express road/ motorway	99.7%
Availability of alternative clean fuels	63.2%

Data source: Adapted from "[Fourth Work Plan of the European Coordinator on the Scandinavian Mediterranean Corridor, P.17, September 2020](#)"

Italy (E. Investment 3.3 for hydrogen testing, and E. Investment 4.3 Installation of electrical charging infrastructures), Germany (measure 1.2.1), and Finland (measure D.P1C4I1) plan to increase alternative clean fuel availability by deploying more charging stations along their road network.

Airports

Among the 19 airports on the SCAN-MED corridor, 14 are connected to rail. There was no access to alternative clean fuels, although some work is on-going in Berlin, Copenhagen, and Hannover airports. No NRRPs measure improving airport KPIs on the SCAN-MED corridor could be identified.

Seaports

Compliance level is high on the SCAN-MED corridor seaports, however the ports of Bari, Copenhagen and Palermo do not have connection to railways.

Table 31. Key performance indicator for seaports on the Scandinavian – Mediterranean corridor

Key performance indicator (KPI)	2018
Connection to rail	84%
Connection to IWW CEMT IV (5 Seaports connected to IWW)	100%
Availability of alternative clean fuels	84%
Facilities for ship-generated waste	100%

Data source: Adapted from "[Fourth Work Plan of the European Coordinator on the Scandinavian Mediterranean Corridor, P.20, September 2020](#)"

The Italian NRRP includes a measure to deploy alternative clean fuels in seaports (I. Investment 1.1.), although this measure does not seem to include alternative clean fuel solutions for ships.

Rail-road terminals

Most RRTs of the SCAN-MED corridor are still too short for 740m trains (20% compliance) and only around half of the SCAN-MED corridor's RRTs were electrified. No NRRPs measure improving RRT KPIs on the SCAN-MED corridor could be identified.

Table 32. RRT key performance indicator on the Scandinavian – Mediterranean corridor

Key performance indicator (KPI)	2018
Capability for Intermodal (unitised) transshipment	74%
740m train terminal accessibility	19%
Electrified train terminal accessibility	48%

Open accessibility to at least one terminal *

100%

Data source: Adapted from "[Fourth Work Plan of the European Coordinator on the Scandinavian Mediterranean Corridor, P. 22, September 2020](#)"

Conclusions for the SCAN-MED corridor

Altogether, only few measures financed by NRRPs were identified to improve infrastructure on the SCAN-MED corridor. The main impact of NRRPs on the SCAN-MED corridor will be in Italy where three major rail investments are planned such as the high-speed lines between Verona and Brennero, Napoli and Bari and the one between Palermo and Catania.

The main issues facing the corridor (freight train length and ERTMS deployment) are not addressed in NRRPs.

On roads, NRRPs will accelerate alternative clean fuel availability thanks to measures included in Finnish, German and Italian NRRPs.

No NRRPs measure was identified for seaports, airports, or RRTs. The overall impact of NRRPs on the SCAN-MED corridor is moderate.

3.7. The Rhine Alpine (RALP) Corridor

The RALP corridor follows the historic backbone of European economy along the Rhine, from the low countries through the Alps and to Northern Italy. It covers five Member States (Belgium, France, Germany, The Netherlands, and Italy) as well as Switzerland. The RALP corridor includes 22 ports, two of which (Rotterdam and Antwerp) are the largest in Europe, 11 airports, and 13 RRTs.

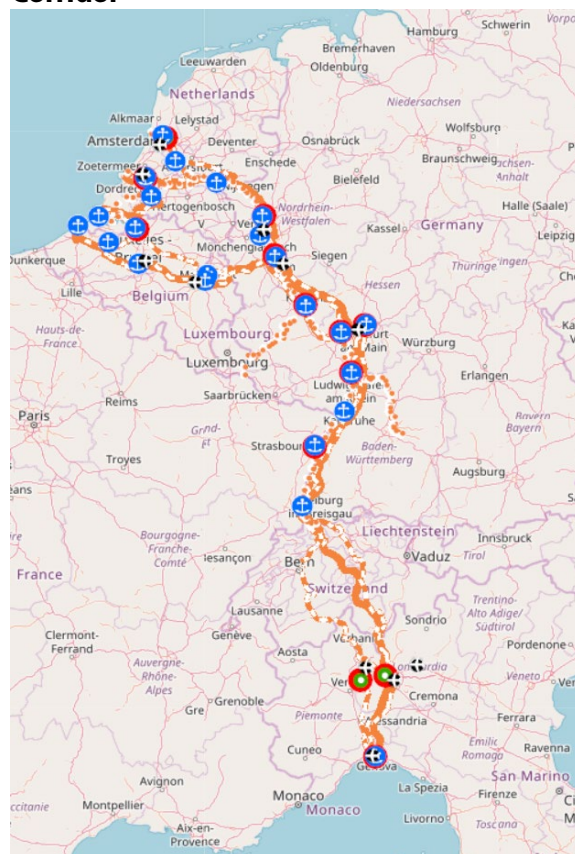
The NRRP for The Netherlands has not yet been approved and therefore could not be evaluated. As a third country, Switzerland does not participate in the RRF.

The main issues facing the corridor are freight train length and ERTMS deployment.

Rail

The railways network has a high overall compliance level, although significant gaps remain regarding ERTMS deployment (all countries but Switzerland) and in Italy regarding freight train length allowed.

Figure 58. Alignment of the Rhine Alpine Corridor



Data source: [TENTec online database](#)

Only two rail measures financed by NRRPs will contribute to increasing compliance with TEN-T requirements for the RALP corridor, and both are located in Italy:

- The Liguria Alpi high-speed rail line will connect Genova to Switzerland (H. Investment 1.2);
- Introducing ERTMS on 3,400 km of rail lines (H. Investment 1.4).

Table 33. Key performance indicator for rail on the Rhine Alpine corridor

Rail key performance indicator (KPI)	NL	BE	DE	FR	CH	IT	Corridor
Train length (freight lines)	100%	100%	100%	/	100%	0%	87%
Line speed (freight lines)	95%	82%	100%	/	90%	100%	95%
ERTMS deployment	50%	34%	10%	/	96%	5%	27%

Data source: Adapted from "[Fourth Work Plan of the European Coordinator on the Rhine Alpine Corridor, June 2020](#)"

Road

Roads on the RALP corridor are fully compliant regarding motorways and the availability of alternative clean fuels.

Table 34. Key performance indicator for rail on the Rhine Alpine corridor

Key performance indicator (KPI)	DE	FR	ES	PT	Corridor
Availability of alternative clean fuels	Available	Available	Available	Available	100%

Data source: Adapted from "[Fourth Work Plan of the European Coordinator on the Rhine Alpine Corridor, June 2020](#)"

Measures to further develop alternative clean fuel on the RALP corridor's roads are included in the Belgian (measure I. Investment I-3F), German (measure 1.2.1.) and Italian (measure E. Investment 4.3) NRRPs.

Inland waterways

The minimum height of 5.25m under bridges is met along the whole RALP corridor. However, the draught requirement still has some gaps, particularly in Germany and, to a lesser extent, in France.

Table 35. Key performance indicator for IWW on the Rhine Alpine corridor

Key performance indicator	NL	BE	DE	FR	CH	IT	Corridor
Min. draught 2.5m	100%	-	74%-	90%	100%	—	82%
Min. height under bridges 5.25m	100%	-	100%	100%	100%	—	100%

Data source: Adapted from "[Fourth Work Plan of the European Coordinator on the Rhine Alpine Corridor, June 2020](#)"

France plans to accelerate renovation and modernisation of its waterways with 100 projects, including locks and dams, all within one measure (Investment 4 (C3.I4)), but information on the location of those projects is not provided. It is possible that some of those projects will be located on the Rhine, but potential impact on IWW compliance could not be assessed.

Airports

No KPIs are provided in RALP 4th Work Plan for airports and no NRRP measures aimed at improving airport KPIs on the RALP corridor could be identified.

Seaports

Seaports on the RALP corridor are fully compliant with TEN-T requirements. No NRRPs measure improving seaports KPIs on the RALP corridor could be identified.

Inland ports

No KPIs are provided in the RALP corridor 4th Work Plan for inland ports. No NRRP measures aimed at improving inland ports on the RALP corridor could be identified.

Rail-road terminals

Most RRTs along the RALP corridor remain too short for 740m trains, whereas some are not electrified nor offer open access. No NRRP measures aimed at improving RRT KPIs on the RALP corridor could be identified.

Conclusions for the RALP corridor

The impact of the Dutch NRRP could not be assessed since it has not yet been approved. As a third country, Switzerland does not participate in the RRF. For the other three countries on the RALP corridor, the impact of NRRPs will be limited to a new high-speed line and ERTMS deployment in Italy, as well as further alternative clean fuel deployment on roads. French projects on IWW could also lead to upgrades of waterways, but details of those projects could not be assessed as details on the projects, such as location and type, are not provided. The main issues facing the corridor (freight train length and ERTMS deployment) are not addressed by the NRRPs. The overall impact of NRRPs on the RALP corridor is not significant.

3.8. The Atlantic (ATL) Corridor

The ATL corridor links the Iberian Peninsula (Portugal and Spain) to Germany through France. It also connects nine of ATL corridor ports on the Atlantic coast from Sines in Portugal to Le Havre in France. The ATL corridor includes 17 ports, 9 airports, and 12 RRRs.

In 2021, the ATL corridor new alignment was approved for Portugal, Spain and France with Regulation (EU) 2021/1153.

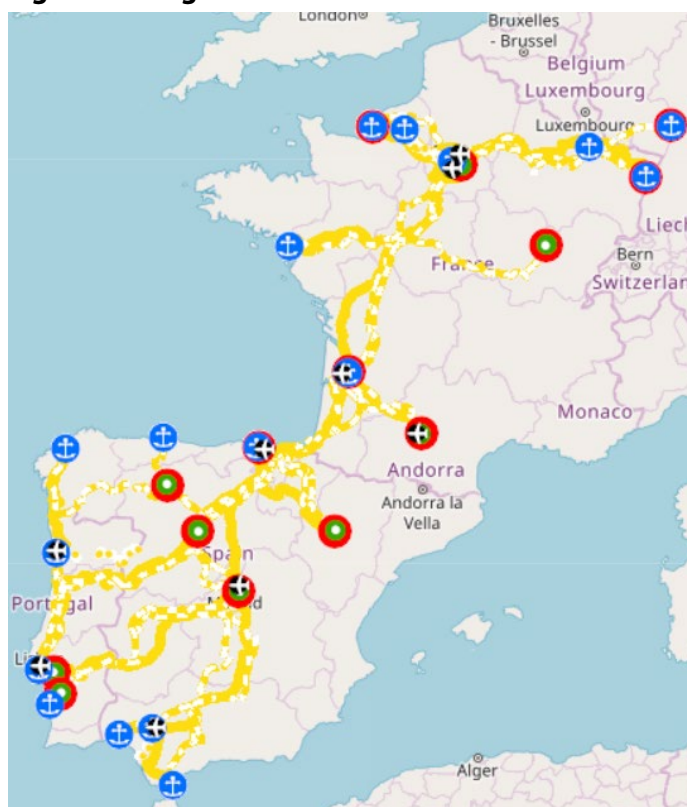
The ATL corridor overlaps with parts of the MED corridor in Spain and NSMED corridor in France.

The main issue facing the corridor is rail track gauge on the Iberian Peninsula.

Rail

Compliance to rail requirements remains a major issue on the Iberian Peninsula, with many rail lines not compliant in Spain and Portugal, such as track gauge and freight train length.

Figure 59. Alignment of the Atlantic Corridor



Data source: [TENtec online database](#)

The German and French networks are almost entirely compliant, except for ERTMS deployment which remains low.

Table 36. Key performance indicator for rail on the Atlantic corridor

Rail key performance indicator (KPI)	DE	FR	ES	PT	Corridor
Traction (electrification)	100%	98%	72%	100%	87%
Line speed (freight lines)	100%	94%	87%	80%	89%
Axle load (freight lines)	100%	100%	100%	100%	100%
Track gauge	100%	100%	26%	0%	54%
Track gauge (IB gauge < 2014 excluded)	100%	100%	100%	100%	100%
Train length (freight lines)	100%	100%	0%	10%	58%
ERTMS	0%	22%	8%	0%	12%

Data source: Adapted from "[Fourth Work Plan of the European Coordinator on the Atlantic Corridor, P.13, May 2020](#)"

The Spanish NRRP includes a large budget (EUR 1.4 billion) allocated to one measure to complete the TEN-T rail network (F.Investment 1 (C6.I1)). On the ATL corridor, key on-going projects such as the Y Vasca (Vitoria-Bilbao - San Sebastian/Astigarraga-Irun) and Talayuela-Plasencia-Cáceres-Mérida-Badajoz line towards Portugal will receive RRF funding. Another major Spanish measure (F.Investment 2 (C6.I2)) includes upgrades of the rail network to improve interoperability (ERTMS, electrification, tracks and other aspects).

France intends to support the rail sector with major investments in its network (Investment 1 (C3.I1)) in part through a recapitalisation of the rail infrastructure manager SNCF Réseau. Although a precise list of projects to be funded is not presented, it is possible that some of the investments will take place on the ATL corridor to address issues such as tunnel gauge, which hampers combined transport, as this has been an issue identified for a long time.

Road

The road network is highly compliant regarding the express road/motorway requirement but is still lacking alternative clean fuel infrastructure, especially in Portugal and Spain, where availability of electric charging stations remains low.

Table 37. Key performance indicator for road on the Atlantic corridor

Key performance indicator (KPI)	DE	FR	ES	PT	Corridor
Type (express road or motorway)	-	100%	99.8%	99.7%	99.9%
Alt fuels (electric)	-	84%	48%	22%	56%
Alt fuels (LNG / CNG)	-	14%	28%	12%	20%
Alt fuels (Hydrogen)	-	5%	0%	0%	2%

Data source: Adapted from "[Fourth Work Plan of the European Coordinator on the Atlantic Corridor, P.17, May 2020](#)"

Portugal will complement its road network with investments on missing links (Investment RE-C07-i02) and capacity increases such as the IP2 Évora eastern bypass on the ATL corridor.

Portugal (G. Investment RE-C07-i00), Spain (A.Investment 2 (C1.I2)), France (Investment 4 (C3.I4)), and Germany (1.2.1.) plan to decarbonise road transport by developing alternative clean fuel infrastructure on their road networks. For example, Portugal will install 15,000 publicly accessible recharging points by the end of 2025, which should significantly improve compliance regarding alternative clean fuels.

Inland waterways

IWW on the ATL corridor consists only of the River Seine in France, which is almost entirely compliant with TEN-T requirements. France will use the RRF to accelerate work on transport infrastructure (Investment 4 (C3.I4)), including the renovation of river networks, in particular locks and dams, to strengthen its inland waterways. Details on the projects are not presented, but it is likely that some of those projects will be located on the Seine as it is a major waterway for France.

Table 38. Key performance indicator for IWW on the Atlantic corridor

Key performance indicator (KPI)	DE	FR	ES	PT	Corridor
CEMT class > Class IV	-	100%	-	-	100%
Draught > 2.5 m	-	100%	-	-	100%
Bridge height	-	100%	-	-	100%
RIS	-	75%	-	-	75%

Data source: Adapted from "[Fourth Work Plan of the European Coordinator on the Atlantic Corridor, P.16, May 2020](#)"

Airports

Only a minority of airports on the ATL corridor are connected by rail. Alternative clean fuel availability for aircraft is also still lacking. No NRRP measures improving airport KPIs on the ATL corridor could be identified.

Table 39. Key performance indicator for airports on the Atlantic corridor

Key performance indicator (KPI)	DE	FR	ES	PT	Corridor
Rail connection	/	33%	50%	0%	29%
Alternative clean fuels (land side)	/	100%	100%	100%	100%
Alternative clean fuels (air side)	/	0%	0%	0%	0%
Term. availability	/	100%	-	-	100%

Data source: Adapted from "[Fourth Work Plan of the European Coordinator on the Atlantic Corridor, P.17, May 2020](#)"

Seaports

Seaports on the ATL corridor are fully compliant with TEN-T requirements, except for alternative clean fuels which are not always available.

Table 40. Key performance indicator for seaports on the Atlantic corridor

Key performance indicator (KPI)	DE	FR	ES	PT	Corridor
Rail connection	-	100%	100%	100%	100%
CEMT connection	-	100%	-	-	100%
Alternative clean fuels	-	33%	50%	0%	25%
Terminal availability	-	100%	100%	100%	100%

Data source: Adapted from "[Fourth Work Plan of the European Coordinator on the Atlantic Corridor, P.17, May 2020](#)"

Spain will use the RRF to fund at least 19 projects of rail accessibility and projects of sustainability within 25 different ports within one measure (C6.I3). The list of ports concerned by this measure is not provided, therefore no impact on the ATL corridor could be estimated, especially since Spanish ports on the ATL corridor are already compliant with TEN-T requirements.

France will use the RRF funding to modernise the digital management system for maritime affairs (Investment 4 (C3.I4)) which will enhance operations at seaports but will not translate into KPI improvement.

Inland ports

Inland ports on the Seine, Moselle (Metz) and Rhine (Strasbourg and Ludwigshafen) achieve full compliance with TEN-T requirements, except for alternative clean fuels which were available only in a small share of the ports. No NRRPs measure improving inland ports KPIs on the ATL corridor could be identified.

Table 41. IWW ports key performance indicator on the Atlantic corridor

Key performance indicator	DE	FR	ES	PT	Corridor
Rail connection	100%	100%	-	-	100%
CEMT connection	100%	100%	-	-	100%
Alternative clean fuels	100%	20%	-	-	33%
Terminal availability	100%	100%	-	-	100%

Data source: Adapted from "[Fourth Work Plan of the European Coordinator on the Atlantic Corridor, P.16, May 2020](#)"

Rail-road terminals

RRTs in Spain and Portugal remain too short for 740m trains and some are still to be electrified, while in Germany there is full compliance. France is in an intermediary position, with a majority of RRTs compliant. No NRRP measures improving RRTs on the ATL corridor could be identified.

Table 42. Key performance indicator for RRTs on the Atlantic corridor

Key performance indicator	DE	FR	ES	PT	Corridor
Intermodality	100%	100%	67%	50%	80%
740m train	100%	75%	0%	0%	40%
Electrification	100%	75%	67%	50%	70%
Term. availability	100%	100%	67%	50%	80%

Data source: Adapted from "[Fourth Work Plan of the European Coordinator on the Atlantic Corridor, P.13, May 2020](#)"

Conclusions for the ATL corridor

Spain will finance major rail network upgrades with the RRF which will allow it to catch up in terms of compliance with TEN-T requirements. France will use the RRF to invest in its rail network, but details on projects to be carried could not be assessed as the nature and location of those projects is not presented in the French plan. Spanish investments in rail address the main issue facing the corridor (rail track gauge on the Iberian Peninsula), although the Portuguese NRRP does not include measures to address this issue.

Only Portugal included in its NRRP a measure to build a new road infrastructure, but all four ATL corridor countries will use the RRF funding to develop alternative clean fuel infrastructure on their road networks.

France is planning to invest in its inland waterways (Investment 4 (C3.I4)), but information on precise projects is not available. It is expected that some investment will take place on the ATL corridor.

The main impact of NRRPs on the ATL corridor will take place on the Spanish rail network which will benefit from major investments. Overall, the impact of NRRPs on the ATL corridor will be moderate.

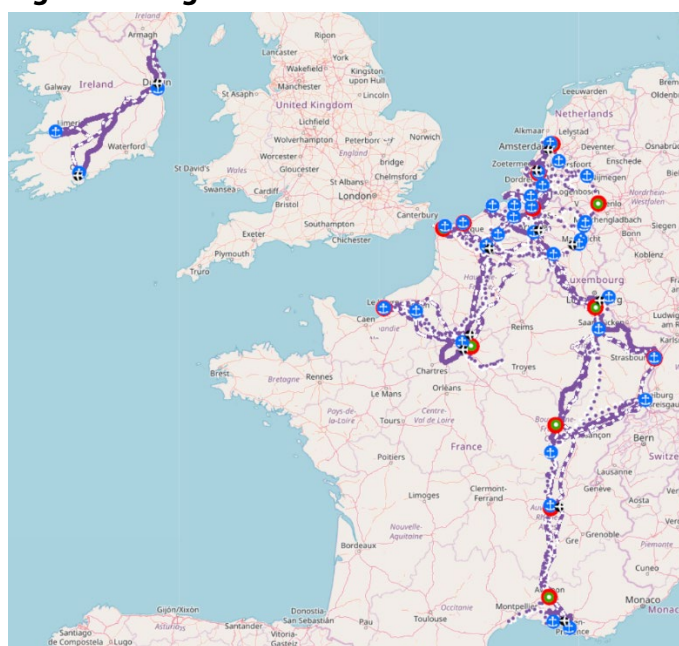
3.9. The North Sea Mediterranean (NSMED) Corridor

The NSMED corridor currently covers five Member States: Ireland, Belgium, The Netherlands, France, and Luxembourg. Due to Brexit, the United Kingdom is no longer part of the NSMED corridor, but the UK network was still considered in the preparation of 4th Work Plan.

In 2020, the NSMED corridor included 6,486km of railways, 4,210km of roads and 3,238km of inland waterways, together with 21 maritime ports (8 of which were in the UK), 26 inland ports, and 21 airports (9 in the UK). The Corridor also includes 13 RRTs on the continent.

As the Dutch NRRP has not yet been accepted, it was not considered in the analysis.

The main issues facing the corridor are freight train length allowed and ERTMS deployment.

Figure 60. Alignment of the NSMED Corridor

Data source: [TENtec online database](#)

Rail

The rail network is mostly compliant with TEN-T requirements, except for train length allowed (74%) and ERTMS, with very different statuses of deployment across the NSMED corridor.

Table 43. Key performance indicator for rail on the North Sea Mediterranean corridor

Rail key performance indicator (KPI)	2019
Electrification	93%
Track gauge 1435mm	100%
Line speed (≥ 100 km/h)	97%
Axle load (≥ 22.5 t)	98%
Train length (740m)	74%

Data source: Adapted from "[Fourth Work Plan of the European Coordinator on the North Sea Mediterranean Corridor, P.13, June 2020](#)"

France plans major investments to renovate and upgrade its national rail network (Investment 1 (C3.I1)). This should benefit the NSMED corridor, but details on the sections of railways are not available. ERTMS deployment in France is not planned within the RRF.

Rail-road terminals

KPIs for RRTs on the NSMED corridor are not presented in the NSMED corridor Work Plan. No NRRPs measure improving RRT KPIs on the NSMED corridor could be identified.

Road

Compliance is fully achieved for 99.5% of the NSMED corridor's roads regarding express roads or motorways. The 4th Work Plan notes that fast electric charging stations are becoming more widespread, especially in Belgium and the Netherlands, while hydrogen stations remain rare.

Luxembourg (2A-3), France (Investment 4 (C3.I4)), and Belgium (I. Investment I-3F) will employ the RFF funding to further develop electric charging stations on their road networks. Luxembourg aim to introduce 1,300 new operational electric charging stations by the end of 2023 and 2,600 by mid-2025.

Inland waterways

Almost all IWWs on the NSMED corridor reach the minimum CEMT class IV. RIS deployment is fully aligned with requirements. The French and Belgian networks are not yet fully compliant regarding minimum draught and height under bridge requirements.

Table 44. Key performance indicator for IWW on the North Sea Mediterranean corridor

Key performance indicator (KPI)	BE	FR	LU	NL	Corridor
CEMT Class (Class IV)	99%	99%	100%	100%	99%
Minimum draught (from 2.5m)	93%	99%	100%	99%	97%
Minimum height under bridges (from 5.25 m)	85%	93%	100%	100%	93%
RIS implementation	100%	100%	100%	100%	100%

Data source: "[Fourth Work Plan of the European Coordinator on the North Sea Mediterranean Corridor, P.17, June 2020](#)"

France plans to accelerate renovation and modernisation of its waterways with 100 projects, including locks and dams, all within one measure (Investment 4 (C3.I4)), although information on those projects is not available. Those projects will benefit the NSMED corridor as this corridor covers most of the French IWW network with the Seine, Scheld, and Rhône basins.

In Belgium, Wallonia Region will upgrade existing IWW above TEN-T requirement of minimum height under-bridges on the Albert Canal (H. Investment I-3.11).

Airports

About two thirds of airports on the NSMED Corridor are connected to rail and most of the other airports are either exempt from the requirement or located in the UK. No NRRPs measure improving airport KPIs on the NSMED corridor could be identified.

Seaports

Seaports achieve full compliance with TEN-T requirements, except for alternative clean fuels which are available at about half of the NSMED corridor.

Table 45. Key performance indicator for seaports on the North Sea Mediterranean corridor

Key performance indicator (KPI)	2017
Connection to rail	100%
Connection to IWW CEMT IV (5 Seaports connected to IWW)	100%
Availability of alternative clean fuels	48%
Facilities for ship-generated waste	100%

Data source: Adapted from "[Fourth Work Plan of the European Coordinator on the North Sea Mediterranean Corridor, P.22, June 2020](#)"

France aims at greening its ports by installing nine new electric connections to offer cold ironing to ships on docks, including for passenger ships and container ships, using the docks in Marseille-Fos port (Investment 6 (C3.I6)). Although this is not a clean fuel solution per say, it allows ships not to rely on on-board generators to run electrical appliances when they dock.

Inland ports

Inland ports achieve full compliance with TEN-T requirements for class IV waterway connections. Alternative clean fuels are available only in 27% of the NSMED corridor. Regarding connection to rail, about 8% of the inland ports on the NSMED corridor need investments to reach full alignment to TEN-T requirements.

Table 46. Inland ports key performance indicator on the North Sea Mediterranean corridor

Key performance indicator (KPI)	2017
Class IV waterway connection	100%
Connection to rail	92%
Availability of alternative clean fuels	27%

Data source: Adapted from "[Fourth Work Plan of the European Coordinator on the North Sea Mediterranean Corridor, P.23, June 2020](#)"

No NRRPs measure improving inland ports KPIs on the NSMED corridor could be identified.

Conclusions for the NSMED corridor

Since the RRP for the Netherlands has not been approved, assessment is performed only for the Irish, French, and Belgian NRRPs.

RRF will allow France to accelerate rail and IWW network upgrades including ones located on the NSMED corridor, but the impact on compliance could not be assessed. Hence, it is not clear if the main issues facing the corridor will be addressed.

As for the other corridors, most Member States on the NSMED corridor aim to develop alternative clean fuel infrastructure on roads.

Overall, the impact of NRRPs on the NSMED corridor is not significant.

3.10. The Rhine Danube (RD) Corridor

From Strasbourg in Eastern France, the RD Corridor extends east to the Black Sea and links nine Member States: France, Germany, Austria, the Czech Republic, the Slovak Republic, Hungary, Croatia, Romania, and Bulgaria, with connections to four third countries (Serbia, Bosnia and Herzegovina, Moldova, and Ukraine). In France, only Strasbourg is located on the RD corridor, whereas Bulgaria and Croatia are on the RD corridor only as a part of the waterborne transport. The RD corridor includes around 5,800km of rail network, 4,500km of roads and 3,900km of waterways, as well as 19 ports, 6 airports, and 44 RRTs. The Hungarian NRRP has not been approved yet and therefore no assessment included.

Figure 61. Alignment of the Rhine Danube Corridor



Data source: [Rhine Danube Corridor - Fourth Corridor Work Plan](#)

The two main issues facing the corridor are firstly a lack of motorways in the East, particularly in Romania and Slovakia, but also to a lower extent in Hungary and the Czech Republic, and secondly freight train length and axle load allowed in Romania.

Rail

Only 9% of the RD corridor is not electrified due to non-compliant rail sections in Germany, the Czech Republic and Romania. Gaps remain regarding the freight train length requirement, in particular in the Czech Republic (0%), the Slovak Republic (0%), and Romania (34%). ERTMS compliance is low, with the highest KPI observed in Austria (28%) and the Czech Republic (12%).

Table 47. Key performance indicator for rail on the Rhine Danube corridor

Key performance indicator (KPI)	AT	FR	DE	CZ	SK	HU	RO	Corridor
Electrification	100%	100%	79%	91%	100%	100%	96%	91%
Line speed $\geq 100\text{km/h}$	100%	100%	100%	87%	88%	99%	95%	96%
Axle load freight 22.5t	100%	0%	97%	92%	100%	84%	25%	76%
Track gauge (1,435mm)	100%	100%	100%	100%	100%	100%	100%	100%
Train length freight min 740m	100%	100%	100%	0%	0%	100%	34%	57%

Data source: Adapted from "[Fourth Work Plan of the European Coordinator on the Rhine Danube Corridor, P.9, May 2020](#)"

Seven measures will upgrade the rail network on the RD corridor in the Czech Republic (G. Investment 3 and C. Investment 2), the Slovak Republic (3. Investment 1) and Romania (C4.I1.). Romania for instance plans to modernise railway lines along TEN-T CNC with ERTMS deployment, electrification, speed, and

capacity increases. This includes a new ERTMS action plan with clear steps to implement ERTMS in the medium (2025) and long term (2030).

Road

The requirement of motorway/express road is fully met in Austria, France and Germany. Hungary also largely complies with this requirement. The biggest gap can be observed in Romania (49%) and the Slovak Republic (53%).

Table 48. Key performance indicator for road on the Rhine Danube corridor

Key performance indicator (KPI)	AT	FR	DE	CZ	SK	HU	RO	Corridor
Motorway/express road	100%	100%	100%	88%	53%	94%	49%	78%

Data source: Adapted from "[Fourth Work Plan of the European Coordinator on the Rhine Danube Corridor, P.13, May 2020](#)"

Romania will develop its motorway network with four new measures for a total of 429km (Infrastructure – 1, D. I3). Those Romanian motorway projects will significantly increase compliance with the motorway/express road requirement on the RD corridor.

Three Member States on the RD corridor also intend to develop alternative clean fuel availability on their road network: Germany (1.2.1.), Romania (D. Reform 1.), and the Slovak Republic (3.Investment 4).

Inland waterways

Compliance for IWWs in general is high on the RD corridor, with some gaps to be filled in particularly for draught and bridge height. No NRRPs measure to improve compliance could be identified.

Table 49. Key performance indicator for IWW on the Rhine Danube corridor

Key performance indicator (KPI)	AT	DE	SK	HU	RO	BG	HR	Corridor
CEMT class IV	100%	100%	100%	100%	100%	100%	30%	90%
Draught > 2.5 m	100%	90%	100%	100%	100%	100%	30%	82%
Bridge height	100%	45%	100%	100%	100%	100%	100%	83%
RIS	100%	100%	100%	100%	100%	100%	100%	100%

Data source: Adapted from "[Fourth Work Plan of the European Coordinator on the Rhine Danube Corridor, P.11, May 2020](#)"

Airports

About two thirds of airports on the RD corridor are connected to rail, but no airport is compliant with the alternative clean fuels requirement. No NRRPs measure improving airport KPIs on the RD corridor could be identified.

Table 50. Key performance indicator for airports on the Rhine Danube corridor

Key performance indicator (KPI)	AT	DE	CZ	SK	HU	RO	Corridor
Rail connection	100%	100%	0%	0%	0%	0%	67%
Alternative clean fuels	0%	0%	0%	0%	0%	0%	0%
Term. availability	100%	100%	100%	100%	100%	100%	100%

Data source: Adapted from "[Fourth Work Plan of the European Coordinator on the Rhine Danube Corridor, P.13, May 2020](#)"

Inland and seaports

Ports achieve full compliance with TEN-T requirements, except for alternative clean fuels which are currently not available. No NRRPs measure improving ports KPIs on the RD corridor could be identified.

Table 51. IWW ports key performance indicator on the Rhine Danube corridor

Key performance indicator (KPI)	AT	FR	DE	CZ	SK	HU	RO	Corridor
Rail connection	100%	100%	100%	50%	83%	100%	100%	89%
CEMT connection	100%	100%	100%	100%	100%	100%	100%	100%
Alternative clean fuels	50%	0%	0%	0%	0%	50%	0%	5%
Term. availability	100%	100%	100%	100%	100%	100%	100%	100%

Data source: Adapted from "[Fourth Work Plan of the European Coordinator on the Rhine Danube Corridor, P.12, May 2020](#)"

Rail-road terminals

RRTs on the RD corridor remain largely non-compliant with TEN-T requirements. No NRRPs measure improving RRT KPIs on the RD corridor could be identified.

Table 52. RRT key performance indicator on the Rhine Danube corridor

Key performance indicator (KPI)	AT	FR	DE	CZ	SK	HU	RO	Corridor
Intermodality	100%	50%	56%	25%	25%	67%	25%	50%
740m train length	17%	0%	6%	0%	25%	33%	0%	9%
Electrified access	50%	0%	38%	0%	25%	0%	0%	23%
Open availability	100%	100%	100%	100%	100%	100%	100%	100%

Data source: Adapted from "[Fourth Work Plan of the European Coordinator on the Rhine Danube Corridor, P.11, May 2020](#)"

Conclusions for the RD corridor

Overall, the impact of NRRPs on the RD corridor is significant, with major investments in the rail and road network.

Benefits of the RRF will be seen for rail, with upgrades of some existing lines planned in the Czech Republic, the Slovak Republic, and Romania. Romania will also finance ERTMS implementation while the Czech Republic will install GSM-R systems on 41 km of rail lines.

Romania will also use the RFF to build over 400km of motorways and hence largely improve its road network compliance with TEN-T requirements. NRRPs will also contribute to deployment of alternative clean fuels on roads of three Member States of the RD corridor (Germany, the Slovak Republic and Romania). Investments in roads and rail in Romania address the main issues facing the corridor.

NRRPs is not expected to impact compliance for ports, IWW, airports, and RRTs.

3.11. Conclusions

For the 22 other NRRPs, the main contribution from the RRF in order to foster compliance with TEN-T requirements will be on the rail network, with three main types of measures put forward by Member States:

- **Rail infrastructure upgrades** on CNC by many Member States (for instance, Croatia, the Czech Republic, France, Greece, Italy, Romania, the Slovak Republic, Slovenia, and Spain), which often include non-compliant sections being electrified, track renewals, tunnel profile enlargement, and capacity upgrades, such as doubling of tracks. Many of these upgrades, but not all, will lead to better compliance to TEN-T requirements.
- **Construction of new rail lines** completing CNC, with several high-speed line projects in Italy (Brescia – Padova, Verona - Brennero, Napoli – Bari, Palermo – Catania, and Liguria Alpi), and Spain (Y Vasca and Talayuela-Plasencia-Cáceres-Mérida-Badajoz line), as well as a new conventional rail link in Austria (Koralmbahn between Graz and Klagenfurt) and Estonia (a section of the westbound Tallinn-Rohuküla railway and Rail Baltic multimodal joint terminal in Tallinn).

- **ERTMS deployment:** Six Member States (the Czech Republic, Finland, Italy, Romania, Slovenia, and Spain) will use the RRF to deploy ERTMS on their rail network.

The second most notable contribution of the RRF to TEN-T policy will be the **further deployment of alternative clean fuels on the road network** in many Member States (Belgium, Croatia, Cyprus, Finland, France, Germany, Greece, Italy, Latvia, Lithuania, Luxembourg, Portugal, Romania, the Slovak Republic, Slovenia, and Spain). Many measures put forward will include the development of electric charging stations and hydrogen refuelling points (Croatia, Italy, Lithuania, Portugal, the Slovak Republic, and Spain).

The RRF will also allow some countries to finalise their road network development, with new motorways planned in Greece, Portugal and Romania. The Romania's NRRP should significantly improve road compliance with TEN-T requirements.

Apart from these large impacts, the RRF will also include other contributions to TEN-T policy objectives and compliance with TEN-T requirements, for instance alternative clean fuels in seaports (France and Italy) and upgrades of inland waterways (Belgium and France).

NRRPs measures improving airports, inland ports and RRTs compliance with TEN-T requirements could be identified.

The contribution of NRRPs to TEN-T policy and TEN-T requirements varies greatly between Member States, transport mode and infrastructure. Member States with more mature infrastructure networks tend to focus on other issues and are not planning significant RRF investments in CNC infrastructure, whereas Member States which are still catching up in terms of transport infrastructure development are more inclined to invest the RRF funding on their CNC.

The overall contribution of the RRF to CNC compliance with TEN-T requirements can be described as moderate, as impacts in some countries will not be substantial and major benefits are expected in Southern and Central Europe.

4. RECOMMENDATIONS FOR EU POLICY MAKERS

KEY FINDINGS

- Several of the EU's transport sector priorities need to be better addressed in the NRRPs update. These include:
 - Cross border projects and cross border travel
 - Facilitation of modal shift to rail and waterborne transport, including short sea shipping and seaports
 - Facilitation of multi-modal passenger transport
 - Improvement of safety and security measures
 - Improvements around the social aspects of transport (e.g. gender equality and inclusion)
 - Internalising the external costs of transport.
- EU's transport policy change should focus more on promoting energy efficiency and further developing public transport.
- There are horizontal priorities which could be addressed through transport sector measures, for instance, the behavioural change of citizens to increase the use of green/sustainable modes of transport, combining social and sustainable aspects of transport including assessing the impacts of urban planning and transport infrastructure on the environment, using research project results (i.e., impact-oriented decision-making) and ensuring better coherence between the NRRPs to achieve TEN-T objectives.
- Better results could be achieved by leveraging the available financing through the use of financial instruments.

The chapter provides recommendations to the Members of the European Parliament and EU policy makers, based on the assessment performed and discussed in the previous chapters.

4.1. Recommendations for further improvement of the NRRPs

EU policy priorities for smart, sustainable, and resilient transition in the transport sector

There are several transport sector priorities which are not sufficiently addressed by the NRRPs, and where further focus and investments are needed. This conclusion draws from the key SSMS targets: by 2030, high speed rail traffic should double; by 2050, rail freight traffic should double; by 2030, scheduled collective travel under 500 km should be carbon neutral within the EU. In order to achieve these targets, the NRRPs thus need to prioritise initiatives to increase the capacity and efficiency of rail, and improve the sustainability of the EU transport sector. Specifically, the following priorities have been identified:

- **The development of the transport network from the European perspective, or cross-border projects** (one of EU's transport sector main priorities), is not sufficiently addressed in the NRRPs. Only four Member States are planning cross-border projects, and those projects relate to support data availability, access, and exchange of mobility data. It is recommended to increase the number of projects for data exchange between Member States and also to have

a wider scope of cross-border projects, including across different transport modes, public transport and data exchange between Member States. Improved cross-border travel will better support the free flow of passengers and goods and single market operations.

- **Facilitation for the modal shift to rail.** Switching to rail is one of the EU's top transport sector priorities; however, only 11 Member States are planning to improve the sustainability of rail transport and rail terminals, mainly focusing on electrification and further development of rail infrastructure. Given its importance, it is recommended to put a higher focus on rail transport development and the modal shift to rail.
- **Facilitations for the modal shift to waterborne transport, including short-sea shipping and seaports.** Only six Member States are planning to improve the sustainability of waterborne transport and ports, and only three Member States are planning to improve the modal shift, including port development and governance activities. Considering the two main modal shifts to achieve climate action – shift to rail (see the previous recommendation) and shift to waterborne transport – it is recommended to increase investments and, where feasible, to include a cross-border component in waterborne transport measures.
- As stated above, there is a need to increase focus on cross-border travel, which could be complemented with “smart transport” measures for **multi-modal passenger transport**, promoting the shift from private cars to public transport. Considering the nature of the priority for “multi-modal transport”, there is a need for smart solutions facilitating multi-modal transport, including better exchange of transport data and the development of data platforms.
- **Safety and security measures** are not sufficiently addressed in the NRRPs. Road safety and security is addressed only by six Member States despite the EU's target of zero fatalities by 2050 and the fact that road safety remains a challenge for many Member States. Improving the safety and security of other modes of transport is addressed by one Member State only. Therefore, it is suggested to have more safety and security measures and, where it is feasible, to link those measures with other “smart transport” measures.
- **Social aspects of transport are not sufficiently covered.** There are only five measures related to the priority “Fair, accessible and just mobility and passenger rights” and there are no measures related to the priorities “Improve conditions and attractiveness of working in transport sector”. It is therefore recommended to include social aspects as a horizontal priority for different transport measures.
- There are only four measures concerning the priority “**internalising external costs of transport**”. Providing better incentives for transport users to reduce the carbon footprint is one of the ten flagships of the SSMS, therefore it is recommended to address those issues under governance measures. Such measures involve carbon pricing, taxation, and infrastructure charging, but also providing better information to users on transport emissions so that they can make more informed choices about the transport modes they choose to use.

Guidance to Member States and evaluation of the results of the NRRPs

It is recommended to push for more information within a homogenised framework on measures included in the NRRPs, such as a European database and with information in terms of location and nature of the projects. The provided information will help EU policy makers to better monitor the intervention results and to plan transport sector priorities.

- **Better monitor the implementation of NRRPs** by linking the projects with the situation on the ground and in relation to the EU policy priorities. Such practices are used to monitor CNC evolution, where projects are monitored by different key performance indicators which are linked to the EU policy objectives. The monitoring of the projects' contribution to the EU policy objectives will relate not only to the transport sector but to other EU policy sectors as well, and

thus will have added value. For example, the projects could be presented on a map with information on the scope of the project and the expected results included in a project fiche.

- Conducting in the coming years a **complementary analysis** of the impact of NRRPs on EU's transport and TEN-T policy objectives, to monitor and eventually confirm the present analysis carried out for the Committee on Transport and Tourism.

4.2. EU policy direction change

EU policy priorities

There are several EU transport policy priorities which are not sufficiently addressed. It is therefore suggested that the following areas receive more attention:

- Climate action includes both green energy and energy efficiency. The green energy targets are addressed by many measures across most Member States. However, energy efficiency measures, particularly **improved energy efficiency of road transport**, are overlooked. Therefore, more measures related to improving energy efficiency across all transport modes are required. Moreover, progress can be made towards achieving climate action targets by alternative measures, such as reducing road traffic, for example, **public transport development**, including cross-border public transport, should be prioritised in EU transport policies. This could be linked with increased use of alternative fuels for public transport and facilitating a modal shift to rail and waterborne transport.
- EU transport policy objectives could be achieved more effectively if implementation measures are supported with initiatives that promote **behavioural change among citizens**. For instance, incentivizing citizens to use public transport and active forms of mobility (e.g. walking and cycling), and using alternative fuels among private cars and public transport modes. Therefore, citizens' behavioral change should become a key priority across all policy measures.
- Many of the EU transport sector targets can be achieved through "**smarter transport**", including IT systems development, as well as via research projects and leveraging these results for use within the transport sector. Therefore, another area for EU policy change is ensuring that the results from research and development activities are better integrated into transport policy (following an evidence-based policymaking approach) and conducting more targeted transport sector related research (e.g. effective use of hydrogen or linking research results with Horizon Europe research activities and results).
- Aside from a need for increased focus on specific priorities within policymaking, there is also a need for **improved project implementation**. Moreover, considering the significant investments needed, it is recommended that more loans be used, by leveraging the available funding as much as possible, and also by providing funding to private sector stakeholders who are implementing relevant transport sector projects.
- There is a need for **better coherence between NRRPs** to address cross-border projects, multi-modal passenger transport between countries, the use of research results and data exchange needed for "smart transport", as well as in relation to TEN-T policy implementation.

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This Report provides the European Parliament's Committee on Transport and Tourism (TRAN) with an overview of the EU's 29 transport sector priorities and the National Recovery and Resilience Plan's (NRRP) funding to achieve those priorities. NRRP transport sector measures also contribute to the further development of nine TEN-T Core Network Corridors and achievement of TEN-T goals.
